



# Vision Sciences Society Program

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# Vision Sciences Society

18th Annual Meeting, May 18-23, 2018 TradeWinds Island Resorts, St. Pete Beach, Florida

# Program

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# **Board of Directors**



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Tom Sanocki University of South Florida

(year) denotes end of term



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2009 - 2010

2008 - 2009

2007 - 2008

2005-2007

2001 - 2005

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Anthony Norcia 2015 - 2016

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(2019) Director

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2008 - 2012

2008 - 2011

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2006 - 2009

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Tom Sanocki 2001 - 2005

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Harvard Medical School

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Zoe Kourtzi 2009 - 2012

Pascal Mamassian

Tony Movshon

Mary Peterson

# Welcome to the 18th Annual Meeting of the Vision Sciences Society, our 5th year

at the TradeWinds in St. Pete Beach.

Yet again, the membership of VSS has submitted an enormous amount of exciting science. This will result in about 1400 presentations, a diverse choice of symposia and quite a few satellite sessions. On the basis of the abstract review committee's recommendations, the Board of Directors have organised all this in a manner that will hopefully make the meeting a pleasant and exciting experience for all. Fortunately, we have been able to rely on the help of various committees, as well as of the indispensable Shauney Wilson and Shawna Lampkin.

Beside the items of the program that are based on input from the membership, VSS organises a number of special events. One such event is the Keynote Address on Saturday evening. This year, the speaker is Kenneth Catania. While VSS is strongly focussed on human vision, we are probably all aware that there is a lot to be learned about the fundamentals of vision by looking at other species. Doing so can reveal fascinating issues such as the presence of coloured oil droplets in birds' cones that contribute to their tetrachromatic colour vision. Professor Catania will take us even further on a journey across various special senses to broaden our perspective on the evolution of sensory systems. This promises to be a very exciting talk, and we are grateful to VPixx for sponsoring the Keynote Address.

Another special event is our awards session. This year, Melissa Võ is the recipient of the Young Investigator Award. Melissa was selected for this reward because of the new approaches that she has brought to our field, exemplified by her development of the notion of a scene grammar. We are grateful to Elsevier for sponsoring the Young Investigator Award, as well as twenty Student Travel Awards. The Davida Teller Award will go to Nancy Kanwisher for her contribution to unravelling how various brain areas contribute to our perception of the visual world.

# President's Welcome

The Ken Nakayama Medal for Excellence in Vision Science will go to George Sperling to celebrate his many achievements, including his ground breaking work on motion perception and attention. Please join us on Monday for the Awards Ceremony and for brief presentations from the three major award recipients.

We also have several events that are specifically targeted at certain groups. On Saturday, we have both a funding workshop, and a workshop for students and post-docs about getting a faculty position. On Sunday, we have a workshop for students and postdocs about communicating with the general public. During the morning coffee breaks on Saturday and Sunday, for the second year, we offer VSS members an opportunity to connect with industry representatives who are hiring.

There are also many satellite events, ranging from ones that deal with specific experimental techniques, to social meetings for specific groups. This year we are also experimenting with an event especially for the undergraduates who are attending VSS. On Monday afternoon we will have our third Meet the Professors event.

Finally, we will have the usual entertainment. Demo Night is a perfect opportunity to discover new effects, to enjoy beautiful demonstrations of effects that you already knew, or just to mingle informally with colleagues from all over the world. Thanks to Gideon Caplovitz, Arthur Shapiro, Karen Schloss, Gennady Erlikhman, and of course all the presenters, for making this possible. And obviously we will have our yearly party: Club Vision.

Irrespective of whether this is your first VSS meeting or you regularly attend, the VSS Board is eager to hear of any suggestions that you have about how we could improve the meeting. You are therefore all invited to attend the Business Meeting on Tuesday, immediately after the morning session. After a short introduction, the business meeting will be devoted to discussing any issues that you raise.

I look forward to seeing you at VSS, Eli Brenner President, VSS Board of Directors, 2017-2018

# Committees, Staff and Sponsors

Geoff Boynton



### Davida Teller Committee

Eli Brenner, Chair Angela Brown Mike Landy Suzanne Mckee Ruth Rosenholtz Laurie Wilcox

#### Ken Nakayama Committee

Marisa Carrasco, Chair Karl Gegenfurtner Mary Hayhoe Tony Norcia Frans Verstraten Eli Brenner

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Rüdiger von der Heydt Johan Wagemans Sarah Waugh Andrew Welchman David Whitney Sophie Wuerger Yaffa Yeshurun Cong Yu Qasim Zaidi

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Shawna Lampkin Event Manager

Jeff Wilson Technical Manager

#### **Onsite Staff**

Janeen Fabulae Margy Foley Shellie Gallegos Vince Gallegos Linda Hacker Rani Kelly Aiden Lowell Katia Seabra Shawn Sherbondy Renee Smith Rochelle Smith

# Sponsors

We thank our 2018 sponsors for their generous support.









# Wednesday, May 16

9:00 am - 6:00 pm

Computational and Mathematical Models in Vision (MODVIS) *VSS Satellite* 

**Meeting Schedule** 

Horizons

Horizons

Jasmine/Palm

# Thursday, May 17

9:00 am – 6:00 pm	Computational and Mathematical Models in Vision (MODVIS) <i>VSS Satellite</i>
10:00 am – 3:00 pm	Eye Tracking in Virtual Reality VSS Satellite
Friday, May 18	

7:30 am - 9:30 pm	Cyber, Social and Quiet Lounges	Blue Heron, Banyan/Citrus, Glades
8:30 – 9:30 am	Coffee Break	Garden Courtyard
8:30 – 11:45 am	Computational and Mathematical Models in Vision (MODVIS) <i>VSS Satellite</i>	Horizons
8:30 – 11:45 am	Tutorial on Big Data and Online Crowd-Sourcing for Vision Research VSS Satellite	Jasmine/Palm
9:00 am - 6:00 pm	Registration Open	Grand Palm Colonnade
11:30 am – 12:00 pm	Coffee Break	Garden Courtyard
12:00 – 2:00 pm	Symposium 1: Clinical insights into basic visual processes	Talk Room 1
12:00 – 2:00 pm	Symposium 2: Vision and visualization: Inspiring novel research directions in vision science	Talk Room 2
2:00 – 2:30 pm	Coffee Break	Garden Courtyard
2:30 – 4:30 pm	Symposium 3: Prediction in perception and action	Talk Room 1
2:30 – 4:30 pm	Symposium 4: When seeing becomes knowing: Memory in the form perception pathway	Talk Room 2
4:30 – 5:00 pm	Coffee Break	Garden Courtyard
5:00 – 7:00 pm	Symposium 5: Visual remapping: From behavior to neurons through computation	Talk Room 1
5:00 – 7:00 pm	Symposium 6: Advances in temporal models of human visual cortex	Talk Room 2
7:00 – 9:30 pm	Opening Night Reception	Beachside Sun Decks

# Saturday, May 19

7:30 am - 9:30 pm	Cyber, Social and Quiet Lounges	Blue Heron, Banyan/Citrus, Glades
7:45 – 8:30 am	Morning Coffee & Continental Breakfast	Garden Courtyard and Pavilion
8:15 – 9:45 am	Morning Talk Session 1: Visual Search	Talk Room 1
8:15 – 9:45 am	Morning Talk Session 1: Perceptual Learning: Basic	Talk Room 2
8:30 am – 12:30 pm	Morning Poster Sessions	Banyan Breezeway and Pavilion
7:30 am – 6:45 pm	Registration Open	Grand Palm Colonnade
9:00 am – 5:30 pm	Exhibits Open	Pavilion
9:45 – 10:30 am	Coffee Break	Garden Courtyard and Pavilion
9:45 – 10:30 am	Connect with Industry Reps who are Hiring	Banyan/Citrus
10:45 am – 12:30 pm	Morning Talk Session 2: Attention: Features and objects	Talk Room 1
10:45 am – 12:30 pm	Morning Talk Session 2: Spatial Vision: Modeling and physiology	Talk Room 2
12:30 – 2:30 pm	Lunch Break (on your own)	Cash lunch in the Garden Courtyard
1:00 – 2:00 pm	Student & Postdoc Workshop: Getting that Faculty Job	Jasmine/Palm
1:00 – 2:00 pm	VSS Workshop on Grantsmanship & Funding	Sabal/Sawgrass

2:30 – 4:15 pm	Afternoon Talk Session 1: Perception and Action: Performance	Talk Room 1
2:30 – 4:15 pm	Afternoon Talk Session 1: Visual Working Memory	Talk Room 2
2:45 – 6:45 pm	Afternoon Poster Sessions	Banyan Breezeway and Pavilion
4:15 <b>-</b> 5:00 pm	Afternoon Coffee & Snack	Garden Courtyard and Pavilion
5:15 – 6:45 pm	Afternoon Talk Session 2: Faces: Emotion and social cues	Talk Room 1
5:15 – 6:45 pm	Afternoon Talk Session 2: Eye Movements: Neural mechanisms	Talk Room 2
7:15 – 8:15 pm	Keynote Address: Kenneth C. Catania	Talk Room 1-2

# Sunday, May 20

7:30 am – 6:45 pm	Registration Open	Grand Palm Colonnade
7:30 am – 9:30 pm	Cyber, Social and Quiet Lounges	Blue Heron, Banyan/Citrus, Glades
7:45 – 8:30 am	Morning Coffee & Continental Breakfast	Garden Courtyard and Pavilion
8:15 – 9:45 am	Morning Talk Session 1: Faces: Recognition and perception	Talk Room 1
8:15 – 9:45 am	Morning Talk Session 1: Color and Light: Lower level	Talk Room 2
8:30 am - 12:30 pm	Morning Poster Sessions	Banyan Breezeway and Pavilion
9:00 am - 5:30 pm	Exhibits Open	Pavilion
9:45 – 10:30 am	Coffee Break	Garden Courtyard and Pavilion
9:45 – 10:30 am	Connect with Industry Reps Who are Hiring	Banyan/Citrus
10:45 am – 12:30 pm	Morning Talk Session 2: Visual Memory: Cognitive neuroscience	Talk Room 1
10:45 am – 12:30 pm	Morning Talk Session 2: Eye Movements: Performance	Talk Room 2
12:30 – 2:30 pm	Lunch Break (on your own)	Cash lunch in the Garden Courtyard
1:00 – 2:00 pm	Student & Postdoc Workshop: The Public Face of Your Science	Jasmine/Palm
2:30 – 4:15 pm	Afternoon Talk Session 1: Attention: Models, methods and multiple targets	Talk Room 1
2:30 – 4:15 pm	Afternoon Talk Session 1: Binocular Vision: Neural mechanisms	Talk Room 2
2:45 – 6:45 pm	Afternoon Poster Sessions	Banyan Breezeway and Pavilion
4:15 – 5:00 pm	Afternoon Coffee & Snack	Garden Courtyard and Pavilion
4:15 – 5:00 pm	Undergraduate Vision Researchers Mixer	Jasmine/Palm
5:15 – 7:15 pm	Afternoon Talk Session 2: Development and Disorders	Talk Room 1
5:15 – 7:15 pm	Afternoon Talk Session 2: Object Recognition: Categories	Talk Room 2
7:30 – 8:30 pm	FoVea (Females of Vision et al) Workshop VSS Satellite	Horizons

# Monday, May 21

7:30 am – 9:30 pm	Cyber Lounge	Blue Heron
7:30 am – 12:30 pm	Social and Quiet Lounges	Banyan/Citrus, Glades
7:45 – 8:30 am	Morning Coffee & Continental Breakfast	Garden Courtyard and Pavilion
7:45 am – 1:30 pm	Registration Open	Grand Palm Colonnade
8:15 – 9:45 am	Morning Talk Session 1: Faces: Development and disorders	Talk Room 1
8:15 – 9:45 am	Morning Talk Session 1: Temporal Processing	Talk Room 2
8:30 am – 12:30 pm	Morning Poster Sessions	Banyan Breezeway and Pavilion
9:00 am - 12:30 pm	Exhibits Open	Pavilion
9:45 – 10:30 am	Coffee Break	Garden Courtyard and Pavilion
10:45 am – 12:15 pm	Morning Talk Session 2: 3D Perception: Objects and surfaces	Talk Room 1
10:45 am – 12:15 pm	Morning Talk Session 2: Attention: Temporal, tracking and divided	Talk Room 2
12:30 – 1:30 pm	VSS Awards Session: Young Investigator Award, Davida Teller Award, Ken Nakayama Medal, Student Travel Awards	Talk Room 1-2

VSS 2018 Program

Spotted Curlew

1:30 <b>-</b> 6:00 pm	Afternoon Off	Go have fun!
2:00 – 3:00 pm	Psychophysics Toolbox Discussion VSS Satellite	Talk Room 1
2:00 – 4:00 pm	Social Hour for Faculty at Primary Undergraduate Institutions (PUIs) <i>VSS Satellite</i>	Royal Tern
2:00 – 4:00 pm	Canadian Vision Social VSS Satellite	Jasmine/Palm
4:30 – 5:45 pm	Meet the Professors	Beach Tent
6:00 – 8:00 pm	Demo Night Beach BBQ	Beachside Sun Decks
7:00 – 10:00 pm	Demo Night Demos	Talk Room 1-2, Jacaranda Hall, Royal Tern, Snowy Egret, Compass,

# Tuesday, May 22

7:30 am – 9:30 pm	Cyber, Social and Quiet Lounges	Blue Heron, Banyan/Citrus, Glades
7:45 – 8:30 am	Morning Coffee & Continental Breakfast	Garden Courtyard and Pavilion
7:45 am – 6:45 pm	Registration Open	Grand Palm Colonnade
8:15 – 9:45 am	Morning Talk Session 1: Visual Memory: Encoding and recall	Talk Room 1
8:15 – 9:45 am	Morning Talk Session 1: Color and Light: Higher level	Talk Room 2
8:30 am – 12:30 pm	Morning Poster Sessions	Banyan Breezeway and Pavilion
9:00 am – 5:30 pm	Exhibits Open	Pavilion
9:45 – 10:30 am	Coffee Break	Garden Courtyard and Pavilion
10:45 am – 12:30 pm	Morning Talk Session 2: Attention: Spatial modulation	Talk Room 1
10:45 am – 12:30 pm	Morning Talk Session 2: Object Recognition: Neural networks	Talk Room 2
12:30 – 1:00 pm	VSS Business Meeting	Talk Room 2
1:00 – 2:30 pm	Virtual Reality as a Tool for Vision Scientists VSS Satellite	Talk Room 1
1:15 – 2:30 pm	Lunch Break (on your own)	Cash lunch in the Garden Courtyard
1:15 – 2:30 pm	VSS Committees Lunch By Invitation Only	Horizons
2:30 – 4:15 pm	Afternoon Talk Session 1: Perception and Action: Decisions	Talk Room 1
2:30 – 4:15 pm	Afternoon Talk Session 1: Perceptual Organization	Talk Room 2
2:45 – 6:45 pm	Afternoon Poster Session	Banyan Breezeway and Pavilion
4:15 – 5:00 pm	Afternoon Coffee & Snack	Garden Courtyard and Pavilion
5:15 – 7:15 pm	Afternoon Talk Session 2: Motion	Talk Room 1
5:15 – 7:15 pm	Afternoon Talk Session 2: Perceptual Learning: Applied	Talk Room 2
10:00 pm – 2:00 am	Club Vision	Talk Room 1

# Wednesday, May 23

7:30 am – 12:45 pm	Cyber, Social and Quiet Lounges	Blue Heron, Banyan/Citrus, Glades
7:45 – 8:30 am	Morning Coffee & Continental Breakfast	Garden Courtyard and Pavilion
7:45 am – 12:45 pm	Registration Open	Grand Palm Colonnade
8:15 – 10:00 am	Morning Talk Session 1: Attention: Neural mechanisms	Talk Room 1
8:15 – 10:00 am	Morning Talk Session 1: Multisensory	Talk Room 2
8:30 am – 12:30 pm	Morning Poster Sessions	Banyan Breezeway and Pavilion
10:00 – 10:45 am	Coffee Break	Garden Courtyard and Pavilion
11:00 am – 12:45 pm	Morning Talk Session 2: Faces: Neural mechanisms	Talk Room 1
11:00 am – 12:45 pm	Morning Talk Session 2: Scene Perception	Talk Room 2





Dance Party 10:00 pm - 2:00 am

# **Poster Schedule**



# Poster Setup and Takedown

All poster sessions are held in Banyan Breezeway and Pavilion. The last three digits of your poster number indicate the number of your poster board.

Posters should be put up at the beginning of a session and taken down at the end. Authors of even numbered posters must be at their posters during the entire "Even Authors Present" time, and authors of odd numbered posters must be at their posters during the entire "Odd Authors Present" time. Authors may present longer if desired.

Please be courteous and take down your poster promptly at the end of the session so that the board is empty when the next presenter arrives to put up his or her poster. Push pins are available for your use and are located in the poster rooms.

# Morning Poster Schedule

Setup: 8:00 - 8:30 am Session: 8:30 am - 12:30 pm Even Authors Present: 9:30 - 10:30 am Odd Authors Present: 10:30 - 11:30 am Take down: 12:30 - 1:00 pm

# Saturday Morning, May 19

#### Banyan Breezeway

Development: Experience and disorders Motion: Biological and flow Perception and Action: Reaching and grasping Perceptual Organization: Ensembles, averaging, numerosity Multisensory Processing: Vision, haptics, body image

#### Pavilion

Visual Memory: Neural correlates 3D Perception: Mechanisms and models Scene Perception: Categorization and memory Faces: Recognition and perception Color and Light: Lightness and brightness

# Saturday Afternoon, May 19

#### Banyan Breezeway

Spatial Vision: Models Color and light: Surfaces, illuminants, materials Eye Movements: Faces, objects, scene recognition Spatial Vision: Neural mechanisms Perceptual Learning: Perception and performance

#### Pavilion

Visual Search: Features and cues Motion: Higher order Attention: Features, objects, faces Temporal Processing: Timing, duration, latency Motion: Neural mechanisms and models

# Afternoon Poster Schedule

Setup: 2:15 – 2:45 pm Session: 2:45 – 6:45 pm Even Authors Present: 3:45 – 4:45 pm Odd Authors Present: 4:45 – 5:45 pm Take down: 6:45– 7:00 pm

# Sunday Morning, May 20

#### Banyan Breezeway

Scene Perception: Objects, search, complexity Object Recognition: Categories Object Recognition: Features, parts, models Perception and Action: Neural mechanisms Perceptual Organization: Grouping and segmentation

#### Pavilion

Attention: Capture Attention: Resources divided and suppressed 3D Perception: Depth and cue combination 3D Perception: Space Visual Search: Models and mechanisms

# Sunday Afternoon, May 20

#### Banyan Breezeway

Faces: Learning, development, aging Color and Light: Psychophysical and neural mechanisms Eye Movements: Pursuit, vergence, blink Faces: Emotions Spatial Vision: Textures and statistics

#### Pavilion

Visual Search: Attention Visual Search: Real world Perception and Action: Decision making Visual Memory: Working memory

# Monday Morning, May 21

#### Banyan Breezeway

Scene Perception: Mechanisms and models Perceptual Learning: Models and neural mechanisms Development: Lifespan and models Multisensory Processing: Vision, vestibular, models Perceptual Organization: Contours and surfaces

#### Pavilion

Visual Search: Memory Visual Memory: Contents Visual Memory: Encoding and retrieval Perception and Action: Arm movements and tools Spatial Vision: Crowding and eccentricity Color and Light: Cognition and preference Eye Movements: Pupil and melanopsin

# Tuesday Morning, May 22

#### Banyan Breezeway

Faces: Neural mechanisms 1 Faces: Disorders Faces: Individual differences Binocular Vision: Rivalry and suppression Temporal Processing: Neural mechanisms

#### Pavilion

Attention: Neural mechanisms and attentional modulation Binocular Vision: Stereopsis Eye Movements: Saccade Attention: Tracking Attention: Temporal Perception and Action: Walking, navigating, driving

# Tuesday Afternoon, May 22

#### Banyan Breezeway

Faces: Neural mechanisms 2 Faces: Familiarity and other-race effects Attention: Inattention and attentional blink Attention: Individual differences Multisensory Processing: Vision and audition

#### Pavilion

Object Recognition: Neural mechanisms Object Recognition: Reading and other Attention: Space Attention: Eye movements Eye Movements: Attention, salience, search, reading

# Wednesday Morning, May 23

#### Banyan Breezeway

Attention: Reward, motivation, emotion Attention: Exogenous and endogenous Perception and Action: Affordances and judgments Eye Movements: Perception and remapping

#### Pavilion

Visual Memory: Change detection Visual Memory: Long term memory Perceptual Organization: Shapes and objects Faces: Gaze, attractiveness, social cues

# Abstract Numbering System

Each abstract is assigned a unique 4 or 5 digit number based on when and where it is to be presented. The format of the abstract numbering is DT.RN (where D is the Day, T is the Time, R is the Room and N is the presentation Number).

#### First Digit - Day Second Digit - Time

- 2 Saturday 1 Early AM talk session 3 Sunday
  - 2 Late AM talk session
    - 3 AM poster session
- 4 Monday 5 Tuesday
- 6 Wednesday
- 5 Late PM talk session 6 PM poster session

#### Third Digit - Room Fourth-Sixth Digits - Number 1 Talk Room 1

- 2 Talk Room 2
- 3 Banyan Breezeway
- 4 Pavilion
- 1, 2, 3... For talks 01, 02... For posters

Examples

21.16 Saturday, early AM talk in Talk Room 1, 6th talk

36.313 Sunday, PM poster in Banyan Breezeway, poster board 13

4 Early PM talk session

53.496 Tuesday, AM poster in the Pavilion, poster board 96

Note: Two digits after the period indicates a talk, three digits indicates a poster (the last two digits are the board number).

# Talk Schedule

# Saturday, May 19

Time 8:15 - 9:45 am 10:45 am - 12:30 pm 2:30 - 4:15 pm 5:15 - 6:45 pm

# Sunday, May 20

Talk Room 1 Visual Search

Visual Search Attention: Features and objects Perception and Action: Performance Faces: Emotion and social cues Talk Room 2 Perceptual Learning: Basic Spatial Vision: Modeling and physiology Visual Working Memory Eye Movements: Neural mechanisms

Time	Talk Room 1	Talk Room 2
8:15 – 9:45 am	Faces: Recognition and perception	Color and Light: Lower level
10:45 am – 12:30 pm	Visual Memory: Cognitive neuroscience	Eye Movements: Performance
2:30 – 4:15 pm	Attention: Models, methods and multiple targets	Binocular Vision: Neural mechanisms
5:15 – 7:15 pm	Development and Disorders	Object Recognition: Categories

# Monday, May 21

TimeTalk Room 1Talk Room 28:15 - 9:45 amFaces: Development and disordersTemporal Processing10:45 am - 12:15 pm3D Perception: Objects and surfacesAttention: Temporal, tracking and divided

# Tuesday, May 22

Time	Talk Room 1	Talk Room 2
8:15 – 9:45 am	Visual Memory: Encoding and recall	Color and Light: Higher level
10:45 am – 12:30 pm	Attention: Spatial modulation	Object Recognition: Neural networks
2:30 – 4:15 pm	Perception and Action: Decisions	Perceptual Organization
5:15 – 7:15 pm	Motion	Perceptual Learning: Applied

# Wednesday, May 23

Time	Talk Room 1	Talk Room 2
8:15 – 10:00 am	Attention: Neural mechanisms	Multisensory
11:00 am - 12:45 pm	Faces: Neural mechanisms	Scene Perception

# Speaker Information

Please arrive at the Talk Room no less than 30 minutes before the start of your session. Presenters are welcome to test their presentations between talk sessions. Please give priority to presenters whose talk is scheduled for the subsequent session.

The meeting rooms are equipped with a data/video projector and a projection screen. Presentations can be made from your Mac or PC laptop. A technician will be present in each room to handle any technical problems that may arise.



# Kenneth C. Catania

Stevenson Professor of Biological Sciences, Vanderbilt University, Department of Biological Sciences



A neuroscientist by training, Ken Catania has spent much of his career investigating the unusual brains and behaviors of specialized animals. These have included star-nosed moles, tentacled snakes, water shrews, alligators, crocodiles, and most recently electric eels. His studies often focus on predators that have evolved special senses and weapons to find and overcome

elusive prey. He is considered an expert in extreme animal behaviors and studies specialized species to reveal general principles about brain organization and sensory systems. Catania was named a MacArthur Fellow in 2006, a Guggenheim Fellow in 2014, and in 2013 he received the Pradel Research Award in Neurosciences from the National Academy of Sciences. Catania received a BS in zoology from the University of Maryland (1989), a Ph.D. (1994) in neurosciences from the University of California, San Diego, and is currently a Stevenson Professor of Biological Sciences at Vanderbilt University.

# **Keynote Address**

# More than meets the eye: the extraordinary brains and behaviors of specialized predators

Saturday, May 19, 2018, 7:15 pm, Talk Room 1-2

Predator-prey interactions are high stakes for both participants and have resulted in the evolution of high-acuity senses and dramatic attack and escape behaviors. I will describe the neurobiology and behavior of some extreme predators, including star-nosed moles, tentacled snakes, and electric eels. Each species has evolved special senses and each provides unique perspectives on the evolution of brains and behavior.



Keynote Address is sponsored by VPixx Technologies, Inc. Visit www.vpixx.com.

# **Opening Night Reception**

#### Friday, May 18, 7:00 - 9:30 pm

Save Friday evening for the spectacular VSS Opening Night Reception! The reception will take place on the beach and beachside sundecks from 7:00 – 9:30 pm.

Don't forget your drink tickets, which can be found in the back of your badge. Your drink tickets are also good at Demo Night and Club Vision. Friends and family may accompany you with the purchase of a Friends and Family Pass. See the Registration Desk to purchase passes.

Prepare to sink your toes into the sand and enjoy this fantastic event! Please remember to wear your badge.

# Davida Teller Award

Vision Sciences Society is honored to present Dr. Nancy Kanwisher with the 2018 Davida Teller Award

VSS established the Davida Teller Award in 2013. Davida was an exceptional scientist, mentor and colleague, who for many years led the field of visual development. The award is therefore given to an outstanding woman vision scientist with a strong history of mentoring.

Dr. Kanwisher will talk during the Awards Session.

### Nancy Kanwisher

Walter A. Rosenblith Professor, Department of Brain and Cognitive Sciences, McGovern Institute for Brain Research, Massachusetts Institute of Technology



My research uses fMRI and other methods to try to discover the functional organization of the brain as a window into the architecture of the human mind. My early forays in this work focused on high-level visual cortex, where my students and I developed the methods to test the functional profile of regions in the ventral visual pathway specialized for the perception of face, places, bodies, and

words. The selectivity of these regions is now widely replicated, and ongoing work in my lab and many other labs is now asking what exactly is represented and computed in each of these regions, how they arise both developmentally and evolutionarily, how they are structurally connected to each other and the rest of the brain, what the causal role of each is in behavior and perceptual awareness, and why, from a computational point of view, we have functional selectivity in the brain in the first place. My career would quite simply never have happened without the great gift of fabulous mentors. Molly Potter fought to have me accepted to graduate school (from the bottom of the waiting list), and, against all reason, did not give up on me even when I dropped out of grad school three times to try to become a journalist. Then after a diversionary postdoc in international security, Anne Treisman gave me an incredible second chance in vision research as a postdoc in her lab, despite my scanty list of publications. Later in my own lab, my luck came in the form of spectacular mentees. I have had the enormous privilege and delight of working with many of the most brilliant young scientists in my field.

I think we scientists have an obligation to share the cool results of our work with the public (who pays for it). My latest effort in this direction is my growing collection of short lectures about human cognitive neuroscience for lay and undergraduate audiences: nancysbraintalks.mit.edu.

#### Functional imaging of the brain as a window Into the architecture of the human mind

Monday, May 21, 2018, 12:30 – 1:30 pm, Talk Room 1-2

The last twenty years of fMRI research have given us a new sketch of the human mind, in the form of the dozens of cortical regions that have now been identified, many with remarkably specific functions. I will describe several ongoing lines of work in my lab on cortical regions engaged in perceiving social interactions, understanding the physical world, and perceiving music. After presenting various findings that use pattern analysis (MVPA), I will also raise caveats about this method, which can both fail to reveal information that we know is present in a given region, and which can also reveal information that is likely epiphenomenal. I'll argue that human cognitive neuroscience would greatly benefit from the invention of new tools to address these challenges.



# Ken Nakayama Medal for Excellence in Vision Science

The Vision Sciences Society is honored to present George Sperling with the 2018 Ken Nakayama Medal for Excellence in Vision Science.

The Ken Nakayama Medal is in honor of Professor Ken Nakayama's contributions to the Vision Sciences Society, as well as his innovations and excellence to the domain of vision sciences.

The winner of the Ken Nakayama Medal receives this honor for high-impact work that has made a lasting contribution in vision science in the broadest sense. The nature of this work can be fundamental, clinical or applied. The Medal is not a lifetime career award and is open to all career stages.

Dr. Sperling will talk during the Awards Session.

# **George Sperling**

Department of Cognitive Sciences, Department of Neurobiology and Behavior, and the Institute of Mathematical Behavioral Sciences, University of California, Irvine



George Sperling attended public school in New York City. He received a B.S. in mathematics from the University of Michigan, an M.A. from Columbia University and a Ph.D. from Harvard, both in Experimental Psychology.

For his doctoral thesis, Sperling introduced the method of partial report to measure the capacity and decay rate of visual sensory

memory, which was renamed iconic memory by Ulrich Neisser. To measure the information outflow from iconic memory, Sperling introduced post-stimulus masking to terminate iconic persistence, and confirmed this with an auditory synchronization paradigm: Subjects adjusted an auditory click to be simultaneous with the perceived onset and on other trials with the perceived termination of visible information. The interclick duration defined the duration of visible persistence.

Sperling's first theoretical venture was a feed-forward gain control model based on shunting inhibition, formalized with a mathematician, Mohan Sondhi. It accounted for the change of visual flicker sensitivity with light intensity and for Barlow's observation that visual receptive fields change from pure excitation in the dark to antagonistic center-surround in the light. Subsequently, Sperling observed that

this same model, with internal noise following the gain control, also accounted for Weber's Law. For binocular vision, Sperling proposed a dynamic, energy-well model (a pre-catastrophe theory "catastrophe" model) to account for multiple stable states in vergence-accommodation as well as for Julesz's hysteresis phenomena in binocular fusion. With Jan van Santen, Sperling elaborated Reichardt's beetle-motion-detection model for human psychophysics, and experimentally confirmed five counter-intuitive model predictions. Shortly afterwards, Charlie Chubb and Sperling defined a large class visual stimuli (which they called "second-order") that were easily perceived as moving but were invisible to the Reichard model. These could be made visible to the Reichard model by prior contrast rectification (absolute value or square), thereby defining the visual pre-processing of a second motion system.

With Zhong-Lin Lu, Sperling found yet another class of stimuli that produced a strong motion perceptions but were invisible to both Reichard (first-order) and second-order motion detecting systems. They proposed these stimuli were processed by a third-order motion system that operated on a salience map and, unlike the first- and second-order systems, was highly influenced by attention. To characterize these three motion-detection systems, they developed pure stimuli that exclusively stimulated each of the three motion system. More recently, Jian Ding and Sperling used interocular out-of-phase sinewave grating stimuli to precisely measure the contribution of each eye to a fused binocular percept. This method has been widely adopted to assess treatments of binocular disorders.

Twenty five years after his thesis work, Sperling returned to attention research with a graduate student, Adam Reeves, to study attention reaction times of unobservable shifts of visual attention which they measured with the same precision as concurrent finger-press motor reaction times. Their basic experiment was then greatly elaborated to produce hundreds of different data points. A simple (3-parameter) attention gating model that involved briefly opening an attention gate to short-term memory accurately accounted for the hundreds of results. Subsequently, Erich Weichselgartner and Sperling showed that the shifts of visual attention in a Posner-type attention-cued reaction time experiment could be fully explained by independent spatial and temporal attention gates.

In a study of dual visual attention tasks, Melvin Melchner and Sperling demonstrated the first Attention Operating Characteristics (AOCs). Sperling and Barbara Dosher showed how AOCs, the ROCs of Signal Detection Theory, and macro-economic theory all used the same underlying utility model. Shui-I Shih and Sperling revisited the partial-report paradigm to show that when attention shifted from one row of letters to another, attention moved concurrently to all locations. Together, these attention experiments showed that visual spatial attention functions like the transfer of power from one fixed spotlight to another, rather than like a moving spotlight. Most recently, Sperling, Peng Sun, Charlie Chubb, and Ted Wright, developed efficient methods for measuring the perceptual attention filters that define feature attention.

Sperling owes what success he has had to his many wonderful mentors and collaborators. Not fully satisfied with these fifty-plus years of research, Sperling still hopes to do better in the future.

#### Five encounters with physical and physicslike models in vision science

Monday, May 21, 2018, 12:30 - 1:30 pm in Talk Room 1-2 Two early concepts in a vision course are photons and

visual angles:

1. Every second, a standard candle produces 5.1×10<sup>16</sup> photons, enough to produce 6.8×10<sup>6</sup> photons for every one of the 7.7×10<sup>9</sup> persons on earth–a very bright flash (68,000\*threshold) if delivered to the pupil. Obviously, photons pass seamlessly through each other or we'd be in a dense fog. And, the unimaginably large number of photons solves the ancients' problem: How can the light from a candle produce a detailed image behind a tiny, <sup>1</sup>/<sub>4</sub> inch pupil that captures only an infinitesimal fraction of the meager candlelight reflected off relatively distant surfaces?

2. The visual angles of the moon  $(0.525^{\circ})$  and the sun  $(0.533^{\circ})$  are almost the same although their physical sizes are enormously different. Occlusion demo: A solar eclipse on a reduced scale in which the earth is 1/4 inch diam, the moon is 1/16 inch diam 7.5 inch away, and the sun is a 27 inch beach ball 250 ft away. Note: The beach ball nearest the sun, Alpha Centauri, is 12,200 mi away.

3. A simply dynamical system of a marble rolling under the influence of gravity in a bowl (filled with a viscous fluid) whose shape is distorted by the covariance of the images in the two eyes. The marble's position can represent the vergence angle of horizontal, vertical, or torsional vergence of the eyes, or of binocular fusion; the bowl's shape represents the bistable nature of these processes (Sperling, 1970).

4. A simple RC electrical circuit–a capacitor that stores an electrical charge that leaks away through the resistor–illustrates exponential decay. When the resistance is allowed to vary, it represents shunting inhibition in a neuron. A feedforward shunting inhibition circuit models the compression of the 10<sup>6</sup> range of visual inputs into the approximately 30:1 useful range of neural signals, and also the concurrent changes in visual receptive field structure (Sperling and Sondhi, 1968). A constant noise source after the range compression produces a S/N ratio inversely proportional to the average input intensity, i.e., a Weber Law (Sperling, 1989).

5. A similar feedback shunting-gain-control system efficiently models mechanisms of top-down spatial, temporal, and feature attention. Example: Reeves and Sperling, 1986: A simple 3 -parameter model of the shift of visual attention from one rapid stream to an adjacent stream of characters (an attention reaction-time paradigm) accurately accounts for over 200 data points from variants of this procedure.



Save the Date VSS 2019 May 17-22 St. Pete Beach, Florida



Vision Sciences Society is honored to present Melissa Le-Hoa Võe with the 2018 Young Investigator Award.

The Young Investigator Award is an award given to an early stage researcher who has already made a significant contribution to our field. The award is sponsored by Elsevier, and the awardee is invited to submit a review paper to *Vision Research* highlighting this contribution.

Dr. Võ will talk during the Awards Session.

### Melissa Le-Hoa Võ

Professor of Cognitive Psychology, Goethe Universität Frankfurt; Head of the DFG-funded Emmy Noether Group, Scene Grammar Lab, Goethe Universität Frankfurt



Melissa Võ received her PhD from the Ludwig-Maximilians University in Munich in 2009. She then moved on to perform postdoctoral work, first with John Henderson at the University of Edinburgh, and then with Jeremy Wolfe at Harvard Medical School. Dr. Võ's work has been supported by numerous grants and fellowships, including grants from the NIH

and the German Research Council. In 2014, Melissa Võ moved back to Germany where as freshly appointed Full Professor for Cognitive Psychology she set up the Scene Grammar Lab at the Goethe University Frankfurt.

Dr. Võ is a superb scientist who has already had an extraordinary impact on our field. Her distinctive contribution has been to develop the concept of "scene grammar", particularly scrutinizing the distinction between semantics and syntax in visual scenes. The distinction can be illustrated by considering scene components that are semantically incongruent (e.g. a printer in a kitchen) versus those that are syntactically incongruent (e.g. a cooking pot in a kitchen, floating in space rather than resting on a counter). Dr. Võ has used eye-tracking and EEG techniques in both children and adults to demonstrate that the brain processes semantic and syntactic visual information differentially, and has

# Elsevier/VSS Young Investigator Award

shown that scene grammar not only aids visual processing but also plays a key role in efficiently guiding search in real-world scenarios. Her work has implications in many areas, ranging from computer science to psychiatry. In addition to being a tremendously innovative and productive researcher, Dr. Võ is an active mentor of younger scientists and an award-winning teacher. Her outstanding contributions make her a highly worthy recipient of the 12th VSS Young Investigator Award.

#### Reading Scenes: How Scene Grammar Guides Attention and Perception in Real-World Environments

Monday, May 21, 2018, 12:30 – 1:30 pm, Talk Room 1-2

How do you recognize that little bump under the blanket as being your kid's favorite stuffed animal? What no state-of-the-art deep neural network or sophisticated object recognition algorithm can do, is easily done by your toddler. This might seem trivial, however, the enormous efficiency of human visual cognition is actually not yet well understood.

Visual perception is much more than meets the eye. While bottom-up features are of course an essential ingredient of visual perception, my work has mainly focused on the role of the "invisible" determinants of visual cognition, i.e. the rules and expectations that govern scene understanding. Objects in scenes - like words in sentences - are arranged according to a "grammar", which allows us to immediately understand objects and scenes we have never seen before. Studying scene grammar therefore provides us with the fascinating opportunity to study the inner workings of our mind as it makes sense of the world and interacts with its complex surroundings. In this talk, I will highlight some recent projects from my lab in which we have tried to shed more light on the influence of scene grammar on visual search, object perception and memory, its developmental trajectories, as well as its role in the ad-hoc creation of scenes in virtual reality scenarios. For instance, we found that so-called "anchor objects" play a crucial role in guiding attention and anchoring predictions about other elements within a scene, thereby laying the groundwork for efficient visual processing. This opens up exciting new avenues for investigating the building blocks of our visual world that our Scene Grammar Lab is eager to pursue.



# Elsevier/Vision Research Student Travel Awards



VSS congratulates this year's recipients of the Elsevier/Vision Research Travel Awards.

#### **Kirsten Adam**

University of Chicago Advisor: Edward Vogel

#### Benay Başkurt

Bilkent University Advisor: Aaron Michael Clarke

#### Laurent Caplette

Université de Montréal Advisors: Frédéric Gosselin and Karim Jerbi

#### **Elliot Collins**

Carnegie Mellon University Advisor: Marlene Behrmann

#### Nina Hanning

Ludwig-Maximilians-Universität München Advisor: Heiner Deubel



Saya Kashiwakura The University of Tokyo Advisor: Isamu Motoyoshi

#### Lina Klein

Justus-Liebig University Giessen Advisors: Roland W. Fleming and Jody C. Culham

#### Jacob Paul University of Melbourne and Utrecht University

Utrecht University Advisors: Jason Forte and Robert Reeve

#### Yelda Semizer

Rutgers University Advisor: Melchi M. Michel

#### Weizhen Xie

University of California, Riverside Advisor: Weiwei Zhang

# Jit Wei Ang

Nanyang Technological University Advisor: Gerrit Mausr

# Chloe Callahan-Flintoft

Pennsylvania State University Advisor: Brad Wyble

#### Ting-Yu Chang University of Wiscon-

sin-Madison Advisor: Ari Rosenberg

# Abigail Finch

Durham University Advisor: Gordon D. Love

#### Frederik Kamps Emory University Advisor: Daniel D. Dilks

Insub Kim

Sungkyunkwan University Advisor: Won Mok Shimt

#### **Ethan Knights**

University of East Anglia Advisor: Stephanie Rossit

#### **Carmen Pons**

SUNY College of Optometry Advisor: Jose-Manuel Alonso

#### Natalya Shelchkova

Boston University Advisor: Martina Poletti

Jingyang Zhou New York University Advisor: Jonathan Winawer

# Connect with Industry Reps Who are Hiring

Saturday, May 19, 9:45 - 10:30 am, Banyan/Citrus Sunday, May 20, 9:45 - 10:30 am, Banyan/Citrus

VSS would like to help facilitate interactions between industry reps and VSS members seeking industry vision science jobs. Industry reps from Apple, Exponent, Meta Co., Oculus, Rimkus Consulting and Worldviz will be on hand during the Saturday and Sunday morning coffee breaks to discuss open positions for vision scientists in their companies, and to answer questions about working in industry as a vision scientist.

No sign-ups are required. Open to all VSS attendees. All companies will participate in both Saturday and Sunday sessions. This will allow first authors, presenting on Saturday or Sunday mornings, to participate in the Industry event on the opposite day. Attendance on both days is allowed.

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# **Funding Workshop**

# VSS Workshop on Grantsmanship and Funding

No registration required. First come, first served, until full. Saturday, May 19, 2018, 1:00 – 2:00 pm, Sabal/Sawgrass Moderator: Mike Webster, University of Nevada, Reno Discussants: Todd Horowitz, Lawrence R. Gottlob and Cheri WIggs

You have a great research idea, but you need money to make it happen. You need to write a grant. What do you need to know before you write a grant? How does the granting process work? Writing grants to support your research is as critical to a scientific career as data analysis and scientific writing. In this year's session, we are focusing on the work of the US National Institutes of Health (NIH) and the US National Science Foundation. Cheri Wiggs (National Eye Institute) and Todd Horowitz (National Cancer Institute) will provide insight into the inner workings of the NIH extramural research program. Larry Gottlob will represent the Social, Behavioral, and Economic (SBE) directorate of the NSF. There will be ample time for questions.



# Todd Horowitz

National Cancer Institute Todd S. Horowitz, Ph.D., is a Program Director in the Behavioral Research Program's (BRP) Basic Biobehavioral and Psychological Sciences Branch (BBPSB), located in the Division of Cancer Control and Population Sciences (DCCPS) at the National Cancer Institute (NCI). Dr. Horowitz earned his doctorate

in Cognitive Psychology at the University of California, Berkeley in 1995. Prior to joining NCI, he was Assistant Professor of Ophthalmology at Harvard Medical School and Associate Director of the Visual Attention Laboratory at Brigham and Women's Hospital. He has published more than 70 peer-reviewed research papers in vision science and cognitive psychology. His research interests include attention, perception, medical image interpretation, cancer-related cognitive impairments, sleep, and circadian rhythms.



# Lawrence R. Gottlob

National Science Foundation Larry Gottlob is a Program Director in the Perception, Action, and Cognition program at the National Science Foundation. His permanent home is in the Psychology Department at the University of Kentucky, but he is on his second rotation at NSF. Larry received his PhD from Arizona State University in 1995 and

has worked in visual attention, memory, and cognitive aging.



# Cheri Wiggs

National Eye Institute

Cheri Wiggs, Ph.D., serves as a Program Director at the National Eye Institute (of the National Institutes of Health). She oversees extramural funding through three programs — Perception & Psychophysics, Myopia & Refractive Errors, and Low Vision & Blindness Rehabilitation. She received her PhD from Georgetown

University in 1991 and came to the NIH as a researcher in the Laboratory of Brain and Cognition. She made her jump to the administrative side of science in 1998 as a Scientific Review Officer. She currently represents the NEI on several trans-NIH coordinating committees (including BRAIN, Behavioral and Social Sciences Research, Medical Rehabilitation Research) and was appointed to the NEI Director's Audacious Goals Initiative Working Group.

# Graphics Competition



Each year VSS hold a graphics competition seeking interesting visual images to be used for the annual meeting. There are two graphics competitions: a T-Shirt Design Competition and a Program Cover Competition, each with a cash award for the winner.





# **Program Cover**

#### Rebecca J. Woods

Associate Professor / Human Development & Family Science, North Dakota State University

#### Dr. Akiyoshi Kitaoka

Professor, Department of Psychology, Ritsumeikan University, Kyoto, Japan

Do you remember when you first became interested in learning about the visual system? Many students of vision research report an early interest in optical illusions. How much of what we now know about visual processing originated in the intrigue inspired by visual illusions? The design for the VSS 2018 program cover is based on the "Out of Focus" illusion designed by Akiyoshi Kitaoka (2001). Also popularly known as the "Good Vibrations" illusion, its striking effect depends on eye movements, similar to the Ouchi Illusion. Other illusions by Dr. Akiyoshi Kitaoka can be found on his website at http://www.ritsumei.ac.jp/~akitaoka/ index-e.html.

# **T-Shirt Design**

#### Erin Goddard

McGill University, McGill Vision Research Group

In this design I used colours of approximately equal saturation and luminance, and the letters are defined by changes in colour as well as a narrow luminance boundary. I tried it without this luminance boundary but the letters were too hard to see... perhaps it could make an interesting experimental stimulus, but it didn't work as well as a t-shirt design..

# **Undergraduate Vision Researchers Mixer**

Sunday, May 20, 2018, 4:15 - 5:00 pm, Jasmine/Palm

Hosts: Lynne Kiorpes, NYU (VSS Board member) and Nestor Matthews, Denison University (Council for Undergraduate Research, psychology division)

This meet-and-greet event will enable informal interaction among our undergraduate attendees. In addition, faculty present aim to learn about the concerns and priorities for undergraduates attending VSS so that relevant programming can be planned in future years. Refreshments will be served.



# Computational and Mathematical Models in Vision (MODVIS)

Wednesday, May 16 – Friday, May 18, Horizons 9:00 am - 6:00 pm, Wednesday 9:00 am - 6:00 pm, Thursday 8:30 - 11:45 am, Friday

Organizers: Jeff Mulligan, NASA Ames Research Center; Zygmunt Pizlo, UC Irvine; Anne B. Sereno, Purdue University; and Qasim Zaidi, SUNY College of Optometry

Keynote Selection Committee: Yalda Mohsenzadeh, MIT; Michael Rudd, University of Washington

The 7th VSS satellite workshop on Computational and Mathematical Models in Vision (MODVIS) will be held at the Tradewinds Island Resorts in St. Pete Beach, FL, May 16 – May 18. A keynote address will be given by Eero Simoncelli, New York University.

The early registration fee is \$100 for regular participants, \$50 for students. More information can be found on the workshop's website: http://www.conf.purdue.edu/modvis/

# Eye Tracking in Virtual Reality

Thursday, May 17, 10:00 am – 3:00 pm, Jasmine/Palm Organizer: Gabriel Diaz, Rochester Institute of Technology This will be a hands-on workshop run by Gabriel Diaz, with support from his graduate students Kamran Binaee and Rakshit Kothari.

The ability to incorporate eye tracking into computationally generated contexts presents new opportunities for research into gaze behavior. The aim of this workshop is to provide an understanding of the hardware, data collection process, and algorithms for data analysis. Example data and code will be provided in two both Jupyter notebooks and Matlab (choose your preference). This workshop is sponsored by The Optical Society's Vision Technical Group and is suitable for both PIs and graduate students.

# Tutorial on Big Data and Online Crowd-Sourcing for Vision Research

Friday, May 18, 8:30 - 11:45 am, Jasmine/Palm

Organizer: Wilma Bainbridge, National Institutes of Health

Speakers: Wilma Bainbridge, National Institutes of Health; Tim Brady, University of California San Diego; Dwight Kravitz, George Washington University; and Gijsbert Stoet, Leeds Beckett University

Online experiments and Big Data are becoming big topics in the field of vision science, but can be hard to access for people not familiar with web development and coding. This tutorial will teach attendees the basics of creating online crowd-sourced experiments, and how to think about collecting and analyzing Big Data related to vision research. Four experts in the field will discuss how they use and collect Big Data, and give hands-on practice to tutorial attendees. We will discuss Amazon Mechanical Turk, its strengths and weaknesses, and how to leverage it in creative ways to collect powerful, large-scale data. We will then discuss

# Satellite Events

Psytoolkit, an online experimental platform for coding timed behavioral and psychophysical tasks, that can integrate with Amazon Mechanical Turk. We will then discuss how to create Big Datasets using various ways of "scraping" large-scale data from the internet. Finally, we will discuss other sources of useful crowd-sourced data, such as performance on mobile games, and methods for scaling down and analyzing these large data sets.

To help us plan for this event, please register here: http:// wilmabainbridge.com/research/bigdata/bigdataregistration. html

# FoVea (Females of Vision et al) Workshop

Sunday, May 20, 7:30 - 8:30 pm, Horizons

Organizers: Diane Beck, University of Illinois, Urbana-Champaign; Mary A. Peterson, University of Arizona; Karen Schloss, University of Wisconsin – Madison; Allison Sekuler, Baycrest Health Sciences Speaker: Virginia Valian, Hunter College

# Remedying the (Still) Too Slow Advancement of Women

Dr. Valian is a Distinguished Professor of Psychology and Director of *The Gender Equity Project*.

FoVea is a group founded to advance the visibility, impact, and success of women in vision science (www.foveavision.org). We encourage vision scientists of all genders to participate in the workshops.

Please register at: http://www.foveavision.org/vss-workshops.

# **Psychophysics Toolbox Discussion**

Monday, May 21, 2:00 – 3:00 pm, Talk Room 1

Organizer: Vijay Iyer, MathWorks

Panelists: Vijay Iyer (and others TBD)

Discussion of the current-state (technical, funding, community status) of the Psychophysics toolbox, widely used for visual stimulus generation in vision science experiments.

# Social Hour for Faculty at Primarily Undergraduate Institutions (PUIs)

Monday, May 21, 2:00 – 4:00 pm, Royal Tern

Organizer: Katherine Moore, Arcadia University

Do you work at a primarily undergraduate institution (PUI)? Do you juggle your research program, student mentoring, and a heavy teaching load? If so, come along to the PUI social and get to know other faculty at PUIs! It will be a great opportunity to share your ideas and concerns. Feel free to bring your own drinks and snacks. Prospective faculty of PUIs are also welcome to attend and get to know us and our institutions.

# **Canadian Vision Social**

Monday, May 21, 2:00 - 4:00 pm, Jasmine/Palm Organizer: Doug Crawford, York Centre for Vision Research

This afternoon Social is open to any VSS member who is, knows, or would like to meet a Canadian Vision Scientist! This event will feature free snacks and refreshments, with a complementary beverage for the first 200 attendees. We particularly encourage trainees and scientists who would like to learn about the various research and training funds available through York's Vision: Science to Applications (VISTA) program. This event is sponsored by the York Centre for Vision Research and VISTA, which is funded in part by the Canada First Research Excellence Fund (CFREF).

# Virtual Reality as a Tool for Vision Scientists

Tuesday, May 22, 1:00 - 2:00 pm, Talk Room 1 Organizer: Matthias Pusch, WorldViz

In a hands on group session, we will show how Virtual Reality can be used by Vision Scientists for remote and on site collaborative experiments. Full experimental control over stimuli and reactions enable a unique setting for measuring performance. We will experience collaboration with off-site participants, and show the basics of performance data recording and analysis.









Monday, May 21, 2018, 4:30 – 5:45 pm, Beach Tent Students and postdocs are invited to the third annual "Meet the Professors" event, Monday afternoon from 4:30 to 5:45 pm, immediately preceding the VSS Dinner and Demo Night. This is an opportunity for a free-wheeling, open-ended discussion with members of the VSS Board and other professors. You might chat about science, the annual meeting, building a career or whatever comes up.

This year, the event will consist of two 30-minute sessions separated by a 15-minute snack break. Space is limited and is assigned on a first-come, first-served basis.

Participants must pre-register online at http://www. visionsciences.org/2018-meet-the-proefessors. If you are not pre-registered, you may line up at the event, and we will try to accomodate you.

**David Alais** University of Sydney – Uses psychophysical approaches to study how vision combines with touch and sound in multisensory perception and has a long-standing interest in perceptual ambiguity (binocular rivalry and CFS).

**Martin Banks** UC Berkeley – Studies visual space perception including evaluation of stereoscopic displays such as VR and AR.

**Isabelle Bülthoff** Max Planck Institute for Biological Cybernetics – Uses human psychophysics to investigate face recognition.

**Patrick Cavanagh** Dartmouth College, Glendon College – Studies how position is represented in the brain using psychophysics and imaging, focusing on eye movements and object movements that generate large mislocalizations. Also beginning new work on shadows.

**Miguel Eckstein** UC Santa Barbara – Uses psychophysics, computational modeling, fMRI and EEG to study search, attention, learning, eye movements, the perception of faces and medical images.

**lone Fine** University of Washington – Uses behavioral, computational and brain imaging methods to study the effects of early blindness and also does retinal prosthesis research.

**Karl Gegenfurtner** Universität Giessen – Works on color vision, natural images, and the relationship between perception and action.

Julie Golomb Ohio State University – Studies dynamic visual perception and attention using human behavioral, neuro-imaging, and computational techniques.

Jason Haberman Rhodes College – Uses psychophysics and computational approaches to study mechanisms supporting ensemble perception. He is also deeply interested in undergraduate mentorship and best pedagogical practices.

# Meet the Professors

**Mary Hayhoe** University of Texas Austin – Investigates visual control of action decisions in both real and virtual environments.

**Anya Hurlbert** Newcastle University – Studies human color perception, using psychophysics and computational models, with special interests in colour constancy, applications of novel lighting and imaging technologies, and visual art.

**Lester Loschky** Kansas State University – Studies visual cognition, with an emphasis on interactions between attention and higher level cognition, and between scene perception, event comprehension, and memory.

Julio Martinez-Trujillo University of Western Ontario – Studies the neurophysiological mechanisms of visual attention and memory in humans and non-human primates using electrophysiology and psychophysics.

**Jenny Read** Newcastle University – Uses psychophysics and computational modelling to understand stereoscopic vision in humans and insects, and to explore clinical and industrial applications.

Allison Sekuler Baycrest Health Sciences, University of Toronto, McMaster University – Uses psychophysics and neuroimaging to study face processing, pattern and motion perception, spatial vision, perceptual organization, visual attention, perceptual learning, aging, and neural plasticity.

**Steven Shevell** University of Chicago – Studies color vision, using behavioral and computational approaches to understand perception of colored objects. He works also on perceptual resolution of ambiguous neural representations.

Jan Theeuwes Vrije Universiteit Amsterdam – Studies visual attention, eye movements, working memory and emotion using behavioral and brain imaging methods. He also conducts human factors research in the area of traffic safety.

**Bill Warren** Brown University – Studies the visual control of action. He pioneered the use of VR techniques to test the visual guidance of locomotion and navigation during natural behavior.

**Michael Webster**\* University of Nevada, Reno – Studies color and form perception and how visual coding adapts to changes in the environment or the observer.

**Laurie Wilcox**\* York University – Studies stereoscopic depth perception. Her research focuses on understanding fundamental mechanisms and on applications to visual displays e.g. virtual reality.

\*VSS Board Member

# Student and Postdoc Workshops

# VSS Workshop for PhD Students and Postdocs: Getting that Faculty Job

Saturday, May 19, 2018, 1:00 – 2:00 pm, Jasmine/Palm No registration required. First-come, first-served, until full.

#### Moderator: David Brainard

Panelists: Michelle Greene, Tim Brady, Nicole Rust, James Elder A key transition on the academic career path is obtaining a faculty position. This workshop will focus on the application process (optimizing CV, statements, letters), the interview and job talk, handling the two-body problem, and post-offer steps such as negotiation about start-up funds, space, and teaching responsibilities. Panelists include junior scientists who have recently obtained a faculty position, as well as more senior scientists who can offer perspective from the hiring side of the process.



# Michelle Greene

Bates College

Michelle R. Greene is an Assistant Professor of Neuroscience at Bates College, where she heads the Bates Computational Vision Laboratory. Her work examines the temporal evolution of high-level visual perception. She received her PhD from MIT in 2009, and did postdoctoral work at Harvard Medical School and Stanford University before joining Bates in 2017.



# Tim Brady

Timothy Brady is an Asst. Professor in the Department of Psychology at the University of California, San Diego, where he started in 2015, ending his need to think about the faculty job market forever (he hopes). His research uses a combination of behavioral, computational and cognitive neuroscience methods to understand the limits on our ability to encode and

maintain information in visual memory. He received his B.A. in Cognitive Science from Yale University 2006, his Ph.D. from MIT in Brain and Cognitive Sciences 2011 and conducted postdoctoral research in the Harvard University Vision Sciences Laboratory 2011-2015.



### Nicole Rust

#### University of Pennsylvania

Nicole Rust is an Associate Professor in the Department of Psychology. She received her Ph.D. in neuroscience from New York University, and trained as a postdoctoral researcher at Massachusetts Institute of Technology before joining the faculty at Penn in 2009. Research in her laboratory is focused on understanding the neural basis of visual memory,

including our remarkable ability to remember the objects and scenes that we have encountered, even after viewing thousands, each only for few seconds. To understand visual memory, her lab employs a number of different approaches, including investigations of human and animal visual memory behaviors, measurements and manipulations of neural activity, and computational modeling. She has received a number of awards for both research and teaching including a McKnight Scholar award, an NSF CAREER award, a Alfred P. Sloan Fellowship, and the Charles Ludwig Distinguished teaching award. Her research is currently funded by the National Eye Institute at the National Institutes of Health, the National Science Foundation, and the Simons Collaboration on the Global Brain.



#### James Elder York University

James Elder is a Professor in the Department of Psychology and the Department of Electrical Engineering & Computer Science at York University, and a member of York's Centre for Vision Research and Vision: Science to Applications (VISTA) program. His research seeks to improve machine vision systems through a better understanding of visual processing in biological systems. Dr. Elder's current

research is focused on natural scene statistics, perceptual organization, contour processing, shape perception, single-view 3D reconstruction, attentive vision systems and machine vision systems for dynamic 3D urban awareness.



### David Brainard

University of Pennsylvania

David H. Brainard is the RRL Professor of Psychology at the University of Pennsylvania. He is a fellow of the Optical Society, ARVO and the Association for Psychological Science. At present, he directs Penn's Vision Research Center, co-directs Penn's Computational Neuroscience Initiative, co-directs Penn's NSF funded certificate program in Complex Scene Perception, is on the Board of the Vision Sciences Society,

and is a member of the editorial board of the Journal of Vision. His research interests focus on human color vision, which he studies both experimentally and through computational modeling of visual processing. He will be moderating this session.

### VSS Workshop for PhD Students and Postdocs: The public face of your science

Sunday, May 20, 2018, 1:00 – 2:00 pm, Jasmine/Palm No registration required. First-come, first-served, until full.

Moderator: Jeff Schall

Panelists: Allison Sekuler, Frans Verstraten, Morgan Ryan Your research has several potential audiences. In this workshop, we will focus on the general public. When should you tell the world about your latest results? Always? Only if you think it is particularly noteworthy? Only when someone else asks? How should you communicate with the public? Social media? Press releases? How can you attract attention for your work (when you want to) and what should you do if you attract attention that you do not want? Our panel consists of two vision scientists, Allison Sekuler and Frans Verstraten, who have experience in the public eye, and Morgan Ryan, the editor for SpringerNature, who handles the Psychonomic Society journals (including AP&P, PBR, and CRPI). Bring your questions.



# Allison Sekuler

McMaster University

Dr. Allison Sekuler is Vice-President of Research and the Sandra A. Rotman Chair at Baycrest Health Sciences. She came to Baycrest from her position as a Professor in the Department of Psychology, Neuroscience & Behaviour at McMaster University, where she was the first Canada Research Chair in Cognitive Neuroscience (2001-2011). She is also the Co-Chair of

the Academic Colleagues at the Council of Ontario Universities and Chair of the Natural Sciences and Engineering Research Council of Canada's (NSERC) Scholarships & Fellowships group along with being a member of NSERC's Committee for Discovery Research. The recipient of numerous awards for research, teaching and leadership, Dr. Sekuler has a notable record of scientific achievements in aging and vision science, cognitive neuroscience, learning and neural plasticity, and neuroimaging and neurotechnology, as well as extensive experience in senior academic and research leadership roles.



# Frans Verstraten

University of Sydney

Professor Frans Verstraten is the McCaughey Chair of Psychology at the University of Sydney and Head of School. He was a board member and former president of the Vision Sciences Society. Before his move to Australia in 2012 he was also active in the domains of the popularization of science and science communication. Among other things, he gave many

talks for the general audience, participated in a popular science TV-show for several years, and wrote columns in a national newspaper and several magazines. He has been a member of many national and international committees where he represents the psychological and behavioural sciences. Currently, he tries to convince the University's marketing and communication teams to understand the power of good press releases (and to refrain from making unwarranted statements to spice research results up).



#### Morgan Ryan SpringerNature

With over eight years of experience in scholarly publishing, Morgan Ryan is a Senior Editor in Behavioral Sciences at Springer, part of Springer Nature. As the Publishing Development Editor for more than 14 psychology journals, including the Psychonomic Society journals, she

has extensive experience in research promotion and journal strategy. Among other projects, she has organized and presented research-publishing workshops for graduate students and early career scholars. She enjoys initiating and coordinating press office activity between Springer and the Psychonomic Society to increase the public visibility of science.



# Jeff Schall

Vanderbilt University

The session will be moderated by Jeff Schall, who is the E. Bronson Ingram Professor of Neuroscience and Professor of Psychology and of Ophthalmology & Visual Sciences at Vanderbilt University. Schall's research investigates how the visual system selects targets for and controls the initiation of saccades using cognitive neurophysiology, anatomical

and computational approaches. Schall is a founding member of the advisory board for the interdisciplinary major at Vanderbilt, Communication of Science and Technology, through which students master communication tools and techniques, learn science, and are embedded in research programs. He has also been involved in the complexities of communication at the boundary of law and neuroscience.

# 16th Annual Dinner and Demo Night

Monday, May 21, 6:00 – 10:00 pm

Beach BBQ: 6:00 – 8:00 pm, Beachside Sun Decks and limited indoor seating in Banyan Breezeway

Demos: 7:00 – 10:00 pm, Talk Room 1-2, Royal Tern, Snowy Egret, Compass, Spotted Curlew and Jacaranda Hall

Please join us Monday evening for the 16th Annual VSS Dinner and Demo Night, a spectacular night of imaginative demos solicited from VSS members. The demos highlight the important role of visual displays in vision research and education. This year's Demo Night will be organized and curated by Gideon Caplovitz, University of Nevada, Reno; Arthur Shapiro, American University; Gennady Erlikhman, University of Nevada, Reno and Karen Schloss, University of Wisconsin–Madison.

Demos are free to view for all registered VSS attendees and their families and guests. The Beach BBQ is free for attendees, but **YOU MUST WEAR YOUR BADGE** to receive dinner. Guests and family members must purchase a VSS Friends and Family Pass to attend the Beach BBQ. You can register your guests at any time at the VSS Registration Desk, located in the Grand Palm Colonnade. Guest passes may also be purchased at the BBQ event, beginning at 5:45 pm.

The following demos will be presented from 7:00 to 10:00 pm, in Talk Room 1-2, Royal Tern, Snowy Egret, Compass, Spotted Curlew and Jacaranda Hall:

#### Paradoxical memory color for faces

Rosa Lafer-Sousa, MIT; Maryam Hasantash, Institute for Research in Fundamental Sciences, Iran; Arash Afraz, National Institute of Mental Health, NIH; Bevil R. Conway, National Institute of Mental Health, NIH and National Eye Institute, NIH

In this demo we use monochromatic sodium light (589 nm), which renders vision objectively achromatic, to elicit memory colors for familiar objects in a naturalistic setting. The demo showcases a surprising finding, that faces, and only faces, provoke a paradoxical memory color, appearing greenish.

# Vision in the extreme periphery: Perceptual illusions of flicker, selectively rescued by sound

Daw-An Wu, California Institute of Technology; Takashi Suegami, California Institute of Technology and Yamaha Motors Corporation; Shinsuke Shimojo, California Institute of Technologyo

Synchronously pulsed visual stimuli, when spread across central and peripheral vision, appear to pulse at different rates. When spread bilaterally into extreme periphery (70°+), the left and right stimuli can also appear different from each other. Pulsed sound can cause some or all of the stimuli to become perceptually synchronized.

### Don't Go Chasing Waterfalls

Matthew Harrison and Matthew Moroz, University of Nevada Reno

'High Phi' in VR, illusory motion jumps are perceived when the random noise texture of a moving 3D tunnel is replaced with new random textures. In 2D, these illusory jumps tend to be perceived in the direction opposite the preceding motion, but in 3D, this is not always the case!.



# The UW Virtual Brain Project: Exploring the visual system in immersive virtual reality

Chris Racey, Bas Rokers, Nathaniel Miller, Jacqueline Fulvio, Ross Tredinnick, Simon Smith, and Karen B. Schloss, University of Wisconsin, Madison

The UW Virtual Brain Project allows you to explore the visual system in virtual reality. It helps to visualize the flow of information from the eyes to visual cortex. The ultimate aim of the project is to improve neuroscience education by leveraging our natural abilities for space-based learning.

#### Augmented Reality Art

Jessica Herrington, Australian National University

Art inspired by vision science! Come and explore augmented reality artworks that contain interactive, digital sculptures. Augmented reality artworks will be freely available for download as iPhone apps.

### Staircase Gelb effect

Alan Gilchrist, Rutgers University

A black square suspended in midair and illuminated by a spotlight appears white. Now successively lighter squares are added within the spotlight. Each new square appears white and makes the other squares appear to get darker. This demonstrates the highest luminance rule of lightness anchoring and gamut compression.

### Hidden in Plain Sight!

Peter April, Jean-Francois Hamelin, Stephanie-Ann Seguin, and Danny Michaud, VPixx Technologies

Can visual information be hidden in plain sight? We use the PROPixx 1440Hz projector, and the TRACKPixx 2kHz eye tracker, to demonstrate images which are invisible until you make a rapid eye movement. We implement retinal stabilization to show other images that fade during fixations. Do your eyes deceive?

# Do I know you? Discover your eye gaze strategy for face recognition

Janet Hsiao and Cynthia Chan, University of Hong Kong

At VSS, do you often wonder whether you've seen someone before? Are you using good gaze strategies for face recognition? Try our hidden Markov modeling approach (EMHMM; http:// visal.cs.cityu.edu.hk/research/emhmm/) to summarize your gaze strategy in terms of personalized regions-of-interest and transition patterns, and quantitatively assess its similarity to commonly used strategies.

#### Virtual Reality reconstruction of Mondrian's 'Salon for Madame B'

Johannes M. Zanker and Jasmina Stevanov, Royal Holloway University of London; Tim Holmes, Tobii Pro Insight

We present the first Virtual Reality realisation of Mondrian's design for a salon painted in his iconic style which was never realised in his lifetime. Visitors can explore the VR space whilst their eye-movements are tracked allowing the researcher to evaluate possible reasons why Mondrian did not pursue his plan.

#### Hidden Stereo: Hiding phase-based disparity to present ghost-free 2D images for naked-eye viewers

Shin'ya Nishida, Takahiro Kawabe, and Taiki Fukiage, NTT Communication Science Lab

When a conventional stereoscopic display is viewed without 3D glasses, image ghosts are visible due to the fusion of stereo image pairs including binocular disparities. Hidden Stereo is a method to hide phase-based binocular disparities after image fusion, and to present ghost-free 2D images to viewers without glasses.

#### Quick estimation of contrast sensitivity function using a tablet device

Kenchi Hosokawa and Kazushi Maruya, NTT Communication Science Laboratories

Contrast sensitivity functions (CSFs) are useful but sometimes impossible in practical uses due to imitations of time. We demonstrate web-based applications to measure CSF in a short time (<3 min) at moderate precisions. Those applications allow collecting CSFs' data from various types of observers and experimental circumstances.

# The optical illusion blocks: Optical illusion patterns in a three dimensional world

Kazushi Maruya, NTT Communication Science Laboratories; Tomoko Ohtani, Tokyo University of the Arts

The optical illusion blocks are a set of toy blocks whose surfaces have particular geometric patterns. When combined, the blocks induce various types of optical illusion such as shape from shading, cafe wall, and subjective contour. With the blocks, observers can learn rules behind the illusions through active viewpoint changes.

# Dis-continuous flash suppression

Shao-Min (Sean) Hung, Caltech; Po-Jang (Brown) Hsieh, Duke-NUS Medical School; Shinsuke Shimojo, Caltech

We report a novel variant of continuous flash suppression (CFS): Dis-continuous flash suppression (dCFS) where the suppressor and suppressed are presented intermittently. Our findings suggest approximately two-fold suppression power, as evident by lower breaking rates and longer suppression duration. dCFS thus may be suitable for future investigations of unconscious processing.

# Virtual Reality Collaboration with interactive outside-in and tether-less inside-out tracking setup

Matthias Pusch, Dan Tinkham, and Sado Rabaudi, WorldViz

Multiple participants can interact with both local and remote participants in VR – the demo will contain both, outside-in tracking paradigm for some participants, in combo with insideout integrated tracking for other participants. Importantly, the inside-out system will be entirely tether-less (using so-called consumer backpack VR) and the user will be free to explore the entire indoor floor plan.

### StroboPong

VSS Staff

Back by popular demand. Strobe lights and ping pong!

# The illusion of floating objects caused by light projection of cast shadow

Takahiro Kawabe, NTT Communication Science Laboratories

We demonstrate an illusion wherein objects in pictures and drawings apparently float in the air due to the light projection of cast shadow patterns onto them. We also conduct a demonstration of a light projection method making an opaque colored paper appear to be a transparent color film floating in the air.

# Extension of phenomenal phenomena toward printed objects

Takahiro Kawabe, NTT Communication Science Laboratories

We demonstrate that the phenomenal phenomena (Gregory and Heard, 1983) can be extended toward printed objects placed against a background with luminance modulation. In our demo, the audience experiences not only the illusory translation of the printed objects but also their illusory expansion/contraction and rotation.

### Stereo Illusions in Augmented Reality

Moqian Tian, Meta Company

Augmented Reality with environmental tracking and real world lighting projection can uncover new perspectives of some classical illusions. We will present Hallow Face Illusion, Necker's Cube, and Crazy Nuts Illusion in multiple conditions, while observers can interact with the holograms through Meta 2 AR headset.

# A Color-Location Misbinding Illusion

Cristina R. Ceja and Steven L. Franconeri, Northwestern University

Illusory conjunctions, formed by misbound features, can be formed when attention is overloaded or diverted (Treisman & Schmidt, 1982). Here we provide the opportunity to experience a new illusory conjunction illusion, using even simpler stimulus displays.

# Thatcherize your face

Andre Gouws, York Neuroimaging Centre, University of York; Peter Thompson, University of York

The Margaret Thatcher illusion is one of the best-loved perceptual phenomena. Here you will have the opportunity to see yourself 'thatcherized' in real time and we print you a copy of the image to take away.

# The Ever-Popular Beuchet Chair

Peter Thompson, Rob Stone and Tim Andrews, University of York A favorite at demo Night for the past few years, the Beuchet chair is back again. The two parts of the chair are at different distances and the visual system fails to apply size constancy appropriately. The result is people can be shrunk or made giants.

### Illusory grating

William F. Broderick, New York University

By windowing a large two-dimensional sinusoidal grating, a perpendicular illusory grating is created. This illusion is quite strong, and depends on the overall size of the image, as well as the relative size of the grating and windows.

### Look where Simon says without delay

Katia Ripamont, Cambridge Research Systems; Lloyd Smith, Cortech Solutions

Can you beat the Simon effect using your eye movements? Compete with other players to determine who can look where Simon says without delay. All you need to do is to control your eye movements before they run off. It sounds so simple and yet so difficult!

# Chromatic induction from achromatic stimulus

Leone Burridge, Artist/ Medical practitioner in private practice These are acrylic paintings made with only black and white pigments. On sustained gaze, subtle colours become visible.

#### Grandmother's neuron

#### Katerina Malakhova, Pavlov Institute of Physiology

If we could find a grandma cell, what kind of information would this cell code? Artificial neural networks allow us to study latent representations which activate neurons. I choose a unit with the highest selectivity for grandmother images and visualize a percept which drives this neuron.

# Planarian Eyespot(s) – Amazing redundancy in visual-motor behavior

Kensuke Shimojo, Chandler School, Pasadena; Eiko Shimojo, California Institute of Technology

The planarian dissected body parts, even with incomplete eyespots, show 'light avoiding behavior" long before the completion of the entire body (and sensory-motor organs). We will demonstrate this live (in Petri dishes) and in video.

#### Real-Life Continuous Flash Suppression – Suppressing the real world from awareness

#### Uri Korisky, Tel Aviv University

'Real life CFS' is a new method for suppressing real life stimuli. Using augmented reality goggles, CFS masks ("mondrians") are presented to your dominant eye, causing whatever is presented to your non-dominant eye to be suppressed from awareness – even real objects placed in front of you.

### The Motion Induced Contour Revisited

Gideon Caplovitz and Gennady Erlkhman, University of Nevada, Reno

As a tribute to Neomi Weisstein (1939-2015) we recreate and introduce some novel variants of the Motion Induced Contour, which was first described in a series of papers published in the 1980's.

### **Illusory Apparent Motion**

Allison K. Allen, Nicolas Davidenko and Nathan H. Heller, University of California, Santa Cruz

When random textures are presented at a moderate pace, observers report experiencing coherent percepts of apparent motion, which we term Illusory Apparent Motion (IAM). In this demo, we will cue observers to experience different types of motion percepts from random stimuli by using verbal suggestion, action commands, and intentional control.

### Illusory color in extreme-periphery

Takashi Suegami, California Institute of Technology and Yamaha Motors Corporation; Daw-An Wu and Shinsuke Shimojo, California Institute of Technology Our new demo will show that foveal color cue can induce illusory color in extreme-periphery (approx. 70°-90°) where cone cells are less distributed. One can experience, for example, clear red color perception for extreme-peripheral green flash, with isoluminant red foveal pre-cueing (or vice versa).

### Silhouette Zoetrope

Christine Veras, University of Texas at Dallas; Gerrit Maus, Nanyang Technological University

A contemporary innovation of the traditional zoetrope, called Silhouette Zoetrope. In this new device, an animation of moving silhouettes is created by sequential cutouts placed outside a rotating empty cylinder, with slits illuminating the cutouts successively from the back. This new device combines motion, mirroring, depth, and size Illusions.

# Spinning reflections on depth from spinning reflections

Michael Crognale, University of Nevada, Reno

A trending novelty toy when spun, induces a striking depth illusion from disparity in specular reflections from point sources. However, "specular" disparity from static curved surfaces is usually discounted or contributes to surface curvature. Motion obscures surface features that compete with depth cues and result in a strong depth illusion.

### High Speed Gaze-Contingent Visual Search

Kurt Debono and Dan McEchron, SR Research Ltd.

Try to find the target in a visual search array which is continuously being updated based on the location of your gaze. High speed video based eye tracking combined with the latest high speed monitors make for a compelling challenge.

### The photoreceptor refresh rate

Allan Hytowitz, Dyop Vision Associates

A dynamic optotype Dyop (a segmented spinning ring) provides a much more precise, consistent, efficient, and flexible means of measuring acuity. Adjustment of the rotation rate of the segmented ring determined the optimum rate as well as the photoreceptor refresh rate for perceived retrograde motion.

#### Stereo psychophysics by means of continuous 3D target-tracking in VR

Benjamin T. Backus and James J. Blaha, Vivid Vision Labs, Vivid Vision, Inc.; Lawrence K. Cormack and Kathryn L. Bonnen, University of Texas at Austin

What's your latency for tracking binocular disparity? Let us cross-correlate your hand motion with our flying bugs to find out.

### Motion-based position shifts

Stuart Anstis, University of California, San Diego; Patrick Cavanagh, Glendon College, York University

Motion-based position shifts are awesome!



Exhibits are located in the Pavilion.

#### **Exhibit Hours**

Saturday, May 19, 9:00 am – 5:30 pm Sunday, May 20, 9:00 am – 5:30 pm Monday, May 21, 9:00 am – 12:30 pm Tuesday, May 22, 9:00 am – 5:30 pm

# Brain Vision, LLC

#### Booth 3

Brain Vision is the leader for EEG in Vision Science. We offer full integration of EEG with many leading eye tracking systems. We provide flexible and robust solutions for high density, active EEG, wireless EEG, dry EEG, and a wide range of bio-sensors like GSR, EKG, Respiration, and EMG. We integrate eye tracking and EEG with other modalities, such as fMRI, TMS, fNIRS, tDCS/HDtDCS, and MEG. If you want to know how EEG improves Vision Science and how eye-tracking improves EEG, please talk to us. Let us help you push the edge of what research is possible.

### Exponent, Inc.

#### Booth 10

Exponent is an engineering and scientific consulting firm that provides solutions to complex technical problems. Our multidisciplinary team of scientists, physicians, engineers, and business consultants performs in-depth research and analysis in more than 90 technical disciplines. We offer clients the scientific expertise needed to understand important issues and make sound strategic decisions. Our clients include a wide range of manufacturers, utilities, insurers, industry groups, government agencies, venture capital companies, and law firms.

Exponent's Human Factors engineers and scientists evaluate human performance and safety in product and system use. Our consultants study how the limitations and capabilities of people, including memory, perception, reaction time, judgment, physical size and dexterity, affect the way they use a product, interact with an organization or environment, process information, or participate in an activity.

At Exponent, we pride ourselves on the high quality of our 1,000+ employees. More than 800 are degreed technical professionals, and more than 500 have earned an M.D. or Ph.D. Exponent operates 20 regional offices and 6 international locations, and is publicly traded on the NASDAQ exchange under the symbol EXPO.

# **MIT Press**

#### Booth 2

The MIT Press is the only university press in the United States whose list is based in science and technology. This does not mean that science and engineering are all we publish, but it does mean that we are committed to the edges and frontiers of the world – to exploring new fields and new modes of inquiry. We publish about 200 new books a year and 150 issues from over 30 journals. Our goal is to create content that is challenging, creative, attractive, and yet affordable to individual readers. Stop by our booth and receive 30% off all books, or use discount code MITVSS18 at mitpress.mit.edu for the next 30 days and receive the discount.

# Exhibitors

### NeuroNexus

#### Booth 9

NeuroNexus powers neuroscience research through innovative neural probes, systems, and data analytics software. NeuroNexus probes include a full line of high-quality, customizable microelectrode arrays for electrophysiology and optogenetics research. NeuroNexus systems provide integrated plug-and-play solutions to support diverse neurophysiology experiments and workflows. The NeuroNexus data analytics software platform provides powerful, scalable, cross-platform analytical and visualization tools for managing and analyzing neurophysiological data — from individual experiments to complex multi-investigator 'big data'.

# **Oxford University Press**

#### Booth 1

As the largest university press, OUP is a truly global brand, recognized throughout the world as an authoritative and trusted provider of quality research. Our collection includes numerous leading journals in diverse areas, as well as authoritative scholarly works, international reference works, online products, handbooks, textbooks, and consumer titles.

# Rimkus Consulting Group, Inc.

#### Booth 8

Rimkus Consulting Group is a global leader in the field of engineering and scientific consulting. For 35 years our professional workforce has helped clients evaluate complex engineering and scientific problems promptly and professionally. Our consultants work on a wide range of exciting projects dealing with accident investigations, product development, and product evaluations for in-depth analyses of technical problems. We are headquartered in Houston with 49 offices across the U.S., Canada and Europe and work with law firms, insurance companies, corporations, and government agencies.

Rimkus' Human Factors group provides services related to the evaluation of safety, human performance, risk perception, and decision making associated with human interaction with products, environments, and processes. We have worked on a wide range of challenging investigations dealing with perception and detection, visibility, gaze behavior, attention, memory, decision making, etc.

We are seeking candidates to join our Human Factors group. If you have a vision science/neuroscience background, have conducted research using eye tracking technology/artificial intelligence, and want to use this background to investigate accidents dealing with gaze behavior, we are interested in talking to you. Please come talk to us at our booth!

# Rogue Research Inc.

#### Booth 4

Rogue Research Inc. develops the Brainsight family of products, including Brainsight TMS and NIRS for human neuroscience, as well as Brainsight Vet, a complete neuronavigation system and suite of neurosurgical tools for a variety of applications. We also offer design and manufacturing services for custom surgical tool or implants.

# SR Research Ltd.

#### Booth 11

Drop by SR Research and discuss our latest hardware and software additions. We'll have the EyeLink Portable Duo and the Eye-Link 1000 Plus on hand. All new EyeLinks track at up to 2000 Hz binocularly by default, with up to 1000 Hz remote, head free-to move binocular tracking available. While the EyeLink Portable Duo is perfect for school or clinic visits, the EyeLink 1000 Plus provides a uniform, cutting-edge eye-tracking solution for the behavioral lab, MRI/MEG, or EEG. Start with a high-precision, high-speed eye-tracker in the behavioral laboratory and add binocular head free-to-move tracking. Include fiber optic extensions and the same hardware seamlessly becomes the world's leading MRI or MEG eye-tracker. With outstanding technical specifications, portable options, flexible experiment delivery software, and incredible customer support, SR Research enables academics.

# Tobii Pro

#### Booth 12

Tobii Pro provides world-leading eye tracking solutions to academic institutions and commercial companies that want to better understand human behavior. Our solutions consist of hardware, software, training, and support. We also offer eye-tracking-based consumer research studies to customers who do not have the expertise or time to conduct the research themselves.

# VPixx Technologies Inc.

#### Booths 5, 6 and 7

VPixx Technologies welcomes the vision community to VSS 2018, and is excited to demonstrate our TRACKPixx 2kHz binocular eye tracker, alongside the PROPixx DLP LED video projector, now supporting refresh rates up to 1440Hz. The PROPixx has been designed specifically for the generation of precise high refresh rate stimuli for gaze-contingent, stereoscopic, and other dynamic applications. The PROPixx is the world's most flexible display for vision research, featuring resolutions up to 1920×1080, and a perfectly linear gamma. The solid state LED light engine has 30x the lifetime of halogen projectors, a wider color gamut, and zero image ghosting for stereo vision applications. Our high speed circular polarizer can project 480Hz stereoscopic stimuli for passive polarizing glasses into MRI and MEG environments. Come and see the SHIELDPixx Faraday cage for installing the PROPixx inside an MRI/MEG room. In addition, the PROPixx includes an embedded data acquisition system, permitting microsecond synchronization between visual stimulation and other types of I/O including eye tracking, EEG, TMS, audio stimulation, button box input, TTL trigger output, analog acquisition, and more! VPixx Technologies will be using the PROPixx/TRACKPixx combination to demonstrate a new set of gaze-contingent paradigms!

# Ward Technical Consulting

#### Booth 13

Visit Ward Technical Consulting and learn more about the DPI Eyetracker, which leads the industry in accuracy, speed, and dependability. There are instruments still in use after 35 years! With proper maintenance, our Evetracker should be viable for vour entire career! The Dual-Purkinje-Image method of Eyetracking is technically sound. It is proven to be linear, clean, and void of translational artifacts. With a spacial resolution of one-minute of arc and a sample rate of ~4 kHz, you can trust the results! Little interpolation is necessary as this method of Eyetracking is extremely accurate. What you get is accurate and dependable information. When you need results that you can depend upon, you need us! We have been manufacturing and servicing the DPI Eyetracker since 1988. We were chosen by Stanford Research Institute, International because of our technical expertise, reputation, and love of the instrument. You can count on us to be there for you!

# WorldViz

#### Booth 14

WorldViz is the industry leader in immersive virtual reality (VR) solutions, with hardware and software deployed across Fortune 500 companies, academic institutions, and government agencies. WorldViz's core software products are Vizard, a specialized development platform for professional VR app development, and Vizible, a simple yet powerful VR creation and collaboration tool that lets people create VR experiences with no programming and then hold collaborative meetings inside of them with people from around the world. On the hardware side, WorldViz makes high-precision, wide-area VR motion tracking systems, gorgeous VR projection systems, and VizBox, a portable VR rig built inside a pelican case.

WorldViz technology enables users to replace physical processes with immersive virtual methods. Applications range from design visualization and industrial training to interactive education, collaboration, and scientific research.





### Abstract Book

Printed Abstract books are not provided to all attendees, but are are available for purchase at the Registration Desk for \$12. You can download an electronic copy in PDF format from the VSS website.

#### ATM

ATMs can be found in the Grand Palm Colonnade of the TradeWinds Hotel and the the lobby of the Breckenridge Building.

# Audiovisual Equipment for Talks

LCD projectors (e.g., for PowerPoint presentations) will be provided in the talk rooms; however, computers will NOT be provided. Presenters must bring their own computers and set them up BEFORE the start of the session in which they are presenting. We recommend that you test your presentation before your session.

For speakers who did not bring a laptop, there will be a loaner available in the talk room. Please make advance arrangements with Jeff Wilson at the VSS Registration Desk.

### **Baggage Check**

Bags can be checked with the Bell Hop in the main lobby.

#### **Business Center**

The Business Center is located in the lobby. Computer terminals and a printer are available in the VSS Cyber Lounge, located in the Blue Heron meeting room on the second floor.

#### **Business Meeting**

The VSS Business Meeting is Tuesday, May 22, 12:30 – 1:00 pm in Talk Room 2. All VSS members are encouraged to attend. This is your opportunity to hear about VSS, ask questions and give feedback.

### **Certificates of Attendance**

To receive a Certificate of Attendance, please visit the Registration Desk. If you require any changes, we will be happy to email or mail a copy after the meeting.

### Children's Programs/Childcare

Both the TradeWinds Island Grand and Guy Harvey hotels feature an extensive array of programs and activities for children and families. From special events, games, and crafts designed for families, to childcare and camps just for kids, the resort has a program to fit every family's needs. For more information on the wide variety of kids programs, call the Adventure Center at (727) 363-2294 or check the TradeWinds Island Resorts website at www.tradewindsresort.com.

Activities Overview: www.tradewindsresort.com/events-calendar

Daily Kid's Activities Calendar: www.tradewindsresort.com/explore/kids-activities

# **Attendee Resources**

# Code of Conduct

The Vision Sciences Society is committed to providing a safe and professional environment during our annual meeting. All VSS members are expected to conduct themselves in a professional manner. It is unlawful to harass any person or employee because of that person's gender or race. Harassment is prohibited when it creates a hostile or offensive work environment.

#### Contact Us

If you need to reach VSS meeting personnel while at the meeting, call extension 7814 from a house phone. From outside the hotel, call (727) 367-6461, extension 7814.

### **Copying and Printing**

Copy and fax services, as well as general use of printers, is available at the Business Center for a fee. Boarding passes may be printed free of charge. Large format printing for posters is available at the UPS Store, located at 4801 Gulf Blvd, approximately a half mile from the TradeWinds Resort. The UPS Store is open Monday through Friday from 8:00 am – 6:30 pm, and on Saturdays from 9:00 am – 3:00 pm.

A printer is available in the VSS Cyber Lounge, located in the Blue Heron meeting room on the second floor.

#### Cyber Lounge

See Lounges.

#### Disclaimer

The Program Committee reserves the right to change the meeting program at any time without notice. Please note that this program was correct at the time of printing.

#### **Drink Tickets**

Each attendee will receive two "free drink" tickets which may be redeemed at the Opening Night Reception (May 18), Demo Night (May 21), or Club Vision (May 22).

#### Exhibits

All exhibits are located in the Pavilion.

#### Exhibit Hours

Saturday, May 19, 9:00 am – 5:30 pm Sunday, May 20, 9:00 am – 5:30 pm Monday, May 21, 9:00 am – 12:30 pm Tuesday, May 22, 9:00 am – 5:30 pm

#### Exhibitor Setup and Tear down

Setup: Friday, May 18, 4:00 – 7:00 pm and Saturday, May 19, 7:00 – 9:00 am Tear down: Tuesday, May 22, 5:30 – 7:30 pm

#### **Fitness Center**

The Island Grand fitness center is open daily from 6:00 am – 10:00 pm. The Center is available to attendees staying at either of the TradeWinds hotels. The Guy Harvey Outpost fitness center is open 24/7 with a room key.

# Food Service/Catering

Complimentary coffee and tea, as well as a light continental breakfast is available each morning in the Garden Courtyard and the Pavilion. Coffee, tea, and refreshments will also be served each afternoon between afternoon talk sessions.

Your VSS registration includes a reception and a dinner. The Opening Night Reception is held Friday night and the Demo Night dinner is held Monday night. Both events are held on the beach. Attendees may purchase a Friends & Family Pass, which will allow their guests to attend the food and social events. See Friends & Family Pass for details.

Each attendee will be given two "free drink" tickets, good at the Opening Night Reception, Demo Night, or Club Vision.

The VSS schedule gives a generous two-hour lunch period to take advantage of the beautiful surroundings and amenities of the TradeWinds Island Grand Hotel and the Guy Harvey Outpost.

Note: VSS meeting attendees will receive a 10% discount on all food and beverage purchases in ALL TradeWinds Islands Resorts restaurants and bars. You must present your VSS badge to receive the discount.

The 10% discount does not apply to food or drink at VSS events, such as the Opening Night Reception, Demo Night, and Club Vision. Discounted pricing has already been applied to these functions.

### Friends & Family Pass

The VSS Friends & Family Pass will allow your family and friends to enjoy some of our fun VSS social events. For \$50.00, your travel companion can attend the Opening Night Reception and the amazing Demo Night Beach BBQ, as well as enjoy all Coffee/ Snack Breaks and the Daily Continental Breakfast. Passes are only \$10.00 for each additional family member. Kids ages 5 and under are free.

To purchase a Friends & Family Pass, please visit the VSS Registration Desk onsite. Passes will be required for entrance to all social events, breaks and meals.

Note: The VSS Friends & Family Pass does not cover entrance to the scientific sessions. For a guest pass to a scientific session, please inquire at the VSS Registration Desk onsite. For more information, please see Guests.

#### Guests

Guests are allowed complimentary entry into one VSS session to see the poster or talk of the person they are guests of at the meeting.

Guests must register at the VSS Registration Desk upon arrival and must be accompanied by a VSS attendee. Guests must wear their guest badge for entrance into the session they attend.

To attend social functions, including the Opening Night Reception, Demo Night Beach BBQ, Coffee/Snack Breaks and Daily Continental Breakfast, attendees' guests will need to purchase a Friends & Family Pass, available at the VSS Registration Desk. See Friends & Family Pass.

### **Internet Access**

VSS provides free wireless internet access in the meeting areas, guest rooms, and VSS lounges. Connect to twgroup; password is group5500.

If you did not bring your own computer, a limited number of laptop computers with free Internet access are available for your use in the Cyber Lounge, located in the Blue Heron meeting room. A printer is also available in the Blue Heron meeting room.

### Lost and Found

Lost and found is located at the Registration Desk in the Grand Palm Colonnade.

#### Lounges

VSS offers three lounge areas exclusively for meeting attendees:

#### Cyber Lounge

The VSS Cyber Lounge provides tables and chairs, plus computers and a printer for attendee use. The Cyber Lounge is located in the Blue Heron room, upstairs from the VSS Registration Desk in the Grand Palm Colonnade. Also see Internet Access.

#### Quiet Lounge

The VSS Quiet Lounge is designed especially for attendees who need a quiet place to read, nurse, silently meditate, or relax. It is located in the Glades room in Jacaranda Hall.

#### Social Lounge

The VSS Social Lounge features comfortable seating for relaxing and visiting with colleagues. Phone charging stations will be available as well. The Social Lounge is located in the Banyan/ Citrus room in Jacaranda Hall.

### Message Center

Messages for registrants can be left and retrieved at the Registration Desk. A bulletin board will be available in the Grand Palm Colonnade for announcements and job postings.

#### Moderators

Please arrive at the meeting room 30 minutes prior to the start of your session to allow time for setup and to check in with your speakers. Please see the Moderator Instructions given to you. Copies are available at the VSS Registration Desk.

#### Parking

Complimentary self-parking is available to all meeting attendees. Valet parking is available at the TradeWinds Grand Island Resort lobby for an additional fee.

In addition to the parking at the TradeWinds Grand Island Resort, the property directly to the north of the Island Grand has been purchased by the TradeWinds and will be utilized for additional parking. Access is through the Island Grand guard gate

# Phone Charging Station

Phone charging stations will be located at the VSS Registration Desk and the VSS Social Lounge.

# Photographing or Videotaping Presentations

Unless otherwise noted, photographing and videotaping of posters and talks is permitted at VSS. Presenters who do NOT wish to be photographed or videotaped should indicate this by displaying our "No videos and photos" image on their poster or the title slide at the beginning of their talk. The image can be downloaded from the VSS website or you can pick up a printed version at the Registration Desk.

### **Public Transportation**

#### Suncoast Beach Trolley

The Suncoast Beach Trolley connects St. Pete Beach with Pass-a-Grill, Treasure Island, Clearwater and other beach communities along the coast. The trolley runs every 20 – 30 minutes from 5:20 am to 10:16 pm Monday through Thursday and Sunday. Service runs until 11:50 pm on Friday and Saturday. A bus stop is located directly outside the TradeWinds Resort.

Fare: \$2.25/ride or purchase an Unlimited Daily GO Card for \$5.00 and ride all day

#### Central Avenue Trolley

The Central Avenue Trolley serves Central Avenue from The Pier in downtown St. Petersburg to Pass-A-Grille on St. Pete Beach. Fare: multi-zone pricing ranges from free to \$2.25/ride, depending on your destination.

#### The Downtown Looper

Hop aboard the St. Petersburg Trolley/Downtown Looper route to connect you to all of the city's major museums and attractions. The Looper runs every 15 minutes from 10:00 am – 5:00 pm, and until midnight on Friday and Saturday. Look for the bright red and yellow trolleys. Fare: \$0.50/ride, seniors & disabled: \$0.25/ ride.

#### **Quiet Lounge**

See Lounges.

#### Registration

The Registration Desk is located in the Grand Palm Colonnade. It is open during the following times:

#### **Registration Hours**

Friday, May 18, 9:00 am - 6:00 pm

Saturday, May 19, 7:30 am - 6:45 pm

Sunday, May 20, 7:30 am - 6:45 pm

Monday, May 21, 7:45 am - 1:30 pm

Tuesday, May 22, 7:45 am – 6:45 pm

Wednesday, May 23, 7:45 am - 12:45 pm

# Restaurants and Bars at TradeWinds Island Grand

#### Cash & Go Lunches

The TradeWinds will offer a selection of reasonably-priced lunch items just for VSS attendees, Saturday through Tuesday, 12:00 – 2:30 pm. Cash & Go Lunches are located in the Garden Courtyard.

#### Palm Court Italian Grill

Located in the Courtyard area, the Palm Court features a fine dining experience with an extensive collection of wines, including many by the glass. Guests may eat indoors or under the stars on the courtyard patio. Dinner reservations are suggested.

Lunch: Monday – Saturday, 11:30 am – 2:00 pm Brunch: Sunday, 10:00 am – 2:00 pm Dinner: Monday – Saturday, 5:30 – 10:00 pm (closed Sunday)

#### Bermudas Steak & Seafood

Bermudas offers a casual setting with a beach view for dinner. Enjoy aged beef, fresh seafood, and regional specialties.

Breakfast: 7:00 – 11:00 am (daily) Dinner: 5:00 – 10:00 pm (closed Tuesday and Wednesday)

#### Beef 'O' Brady's

A casual restaurant and poolside sports pub, Beef 'O' Brady's has a fun atmosphere with salads, burgers, and wraps, as well as tasty desserts and frosty island concoctions. Open daily.

Sunday – Thursday, 11:00 am – 11:00 pm Friday and Saturday, 11:00 am – midnight Bar Hours: 11:00 am – 2:00 am

#### Flying Bridge

This authentic floating Florida cracker cottage is permanently docked over the meandering Island Grand waterway and features a beachfront deck with a full bar. Dress is casual (many guests dine in beach attire). The fare includes nachos, wings, salads, burgers, wraps, sandwiches, and grilled entrees. Open daily from 11:00 am – 10:00 pm.

#### RedBeard's Sharktooth Tavern

Enjoy nightly live entertainment along with a nice selection of imported bottled beer, full bar, and specialty drinks. Open daily from 4:00 – 11:00 pm (11:00 am – 11:00 pm on Wednesdays and Saturdays). Nightly entertainment is from 8:00 – 9:00 pm. Monday is karaoke night!

#### Salty's

Located beside the adult pool, Salty's is a beachfront tiki bar, which features quick sandwiches and burgers, as well as frozen drinks. Open daily.

Food: 11:00 am – 11:00 pm Cocktails: 11:00 am – 2:00 am

Room Service at the TradeWinds Island Grand Available daily from 6:00 am to 11:00 pm.

#### Awakenings Lobby Bar

An elegant lobby bar in the afternoon and evenings, Awakenings also offers morning coffee by Starbucks. Open from 6:30 am. Closing times vary.

#### Pizza Hut Express

Located onsite at the TradeWinds, Pizza Hut Express offers small, medium, and personal pan pizzas, as well as spicy chicken wings. Room delivery is available at the TradeWinds. Open daily from 8:00 am – 10:00 pm (breakfast served 8:00 am – 11:00 am).

#### Working Cow Ice Cream Shoppe

Featuring gourmet ice cream and decadent sundaes, the Ice Cream Shoppe is open daily from 11:00 am to 10:00 pm.

#### Deli

Located just off the Grand Palm Colonnade, the Deli offers Grab and Go breakfasts, made-to-order sandwiches, salads, snacks and other foods to go. The Deli also features a selection of beverages, including wines. The Deli is open daily from 7:00 am – 2:00 am.

### Restaurants at Guy Harvey Outpost

#### Guy Harvey RumFish Grill

Guy Harvey RumFish Grill showcases a 33,500 gallon aquarium, which was featured on Animal Planet's hit series, "Tanked." Dine on cutting edge seafood, explore the various tanks and enjoy nightly live entertainment with indoor and outdoor bars. Dining hours are 11:30 am – 2:00 pm and 5:00 – 10:00 pm. There is also a Sunday brunch buffet. Reservations are recommended. Bars are open late night.

#### Perks Up

Perks Up offers morning pastries, on-the-go breakfast items, and Starbucks coffee. In the afternoon, guests can stop by for ice cream or enjoy a cocktail. Open daily from 6:00 am – 2:00 pm.

#### Guys Grill

Enjoy casual all-day dining with outdoor beachfront seating for breakfasts, casual lunches and dinners. Open daily 7:00 am – 10:00 pm.

#### Sand Bar

The Sand Bar is a beachfront oasis where guests can indulge in tall, cool drinks. Light snacks, appetizers and sandwiches are also served. Open daily from 11:00 am – midnight.

Room Service at the Guy Harvey Outpost Available daily from 7:00 am to 10:00 pm.

#### Shipping

To ship your poster or other items home from the meeting, ask for the Concierge at the front desk of the TradeWinds Island Grand.

#### Social Lounge

See Lounges.

# **Club Vision Dance Party**

Tuesday, May 22, 10:00 pm – 2:00 am, Talk Room 1 Club Vision, held on the last night of the meeting, is the final social event of VSS.

Wearing glowing or flashing accessories is a tradition for the party and we will again be distributing free glow-inthe-dark necklaces and bracelets. Feel free to also bring your own creative accessories.

Don't miss the highlight of the VSS social calendar. We'll see you at Club Vision!




### Schedule Overview

Friday, May 18, 2018, 12:00 - 2:00 pm

S7 Clinical insights into basic visual processes Talk Room 1

 ${\tt S2}~$  Vision and Visualization: Inspiring Novel Research Directions in Vision Science  ${\rm Talk}~{\rm Room}~{\tt 2}$ 

Friday, May 18, 2017, 2:30 - 4:30 pm

S3 Prediction in perception and action Talk Room 1

S4 When seeing becomes knowing: Memory in the form perception pathway  $Talk \ Room \ 2$ 

Friday, May 18, 2017, 5:00 - 7:00 pm

 ${\tt S5}\,$  Visual remapping: From behavior to neurons through computation  $\,$  Talk Room 1  $\,$ 

 ${\tt S6}~{\rm {\bf Advances}}$  in temporal models of human visual cortex  ${\rm Talk}~{\rm Room}~{\rm 2}$ 

# S7 Clinical insights into basic visual processes

Friday, May 18, 2018, 12:00 - 2:00 pm, Talk Room 1

Organizer(s): Paul Gamlin, University of Alabama at Birmingham; Ann E. Elsner, Indiana University; Ronald Gregg, University of Louisville

Presenters: Geunyoung Yoon, Artur Cideciyan, MiYoung Kwon, Ione Fine

This year's biennial ARVO at VSS symposium features insights into human visual processing at the retinal and cortical level arising from clinical and translational research. The speakers will present recent work based on a wide range of state-of-the art techniques including adaptive optics, brain and retinal imaging, psychophysics and gene therapy.

# 12:02 pm Neural mechanisms of long-term adaptation to the eye's habitual aberration

Speaker: Geunyoung Yoon, Flaum Eye Institute, Center for Visual Science, The Institute of Optics, University of Rochester

### 12:27 pm Human Melanopic Circuit in Isolation from Photoreceptor Input: Light Sensitivity and Temporal Profile

Speaker: Artur Cideciyan, Scheie Eye Institute, Perelman School of Medicine, University of Pennsylvaniat.

### 12:52 pm Vision in the blind

Speaker: Ione Fine, Department of Psychology, University of Washington.

# *1:17 pm* Impact of retinal ganglion cell loss on human pattern recognition

Speaker: MiYoung Kwon, Department of Ophthalmology, University of Alabama at Birmingham.

# Member-Initiated Symposia

### S2 Vision and visualization: Inspiring novel research directions in vision science

Friday, May 18, 2018, 12:00 - 2:00 pm, Talk Room 2

Organizer(s): Christie Nothelfer, Northwestern University, Madison Elliott, UBC, Zoya Bylinskii, MIT, Cindy Xiong, Northwestern University, & Danielle Albers Szafir, University of Colorado Boulder Presenters: Ronald A. Rensink, Aude Oliva, Steven Franconeri, Danielle Albers Szafir

Visualization research seeks design guidelines for efficient visual displays of data. Vision science topics, such as pattern recognition, salience, shape perception, and color perception, all map directly to challenges encountered in visualization, raising new vision science questions and creating a space ripe for collaboration. Four speakers representing both vision science and visualization will discuss recent cross-disciplinary research, closing with a panel to discuss about how vision science and visualization communities can mutually benefit from deeper integration. This symposium will demonstrate that contextualizing vision science research in visualization can expose novel gaps in our knowledge of how perception and attention work.

# 12:01 pm Information Visualization and the Study of Visual Perception

Speaker: Ronald A. Rensink, Departments of Psychology and Computer Science, UBC

### 12:27 pm Where do people look on data visualizations?

Speaker: Aude Oliva, Massachusetts Institute of Technology Additional Authors: Zoya Bylinskii, MIT

# 12:53 pm Segmentation, structure, and shape perception in data visualizations

Speaker: Steven Franconeri, Northwestern University

### 1:19 pm Color Perception in Data Visualizations

Speaker: Danielle Albers Szafir, University of Colorado Boulder

### S3 Prediction in perception and action

Friday, May 18, 2018, 2:30 - 4:30 pm, Talk Room 1

Organizer(s): Katja Fiehler, Department of Psychology and Sports Science, Giessen University, Giessen, Germany

Presenters: Mary Hayhoe, Miriam Spering, Cristina de la Malla, Katja Fiehler, Kathleen Cullen

Prediction is an essential mechanism enabling humans to prepare for future events. This is especially important in a dynamically changing world, which requires rapid and accurate responses to external stimuli. While it is unquestionable that predictions play a fundamental role in perception and action, their underlying mechanisms and neural basis are still poorly understood. The goal of this symposium is to integrate recent findings from psychophysics, sensorimotor control, and electrophysiology to provide a novel and comprehensive view on predictive mechanisms in perception and action spanning from behavior to neurons and from strictly laboratory tasks to (virtual) real world scenarios

### 2:32 pm Predictive eye movements in natural vision

Speaker: Mary Hayhoe, Center for Perceptual Systems, University of Texas Austin, USA

### 2:54 pm Smooth pursuit eye movements as a model of visual prediction

Speaker: Miriam Spering, Department of Ophthalmology & Visual Sciences, University of British Columbia, Vancouver, Canada

### 3:16 pm Prediction in interceptive hand movements

Speaker: Cristina de la Malla, Department of Human Movement Sciences, Vrije Universiteit Amsterdam, The Netherlands

### 3:38 pm Somatosensory predictions in reaching

Speaker: Katja Fiehler, Department of Psychology and Sports Science, Giessen University, Giessen, Germany

# 4:00 pm Prediction during self-motion: the primate cerebellum selectively encodes unexpected vestibular information

Speaker: Kathleen Cullen, Department of Physiology, McGill University, Montréal, Québec, Canada

### S4 When seeing becomes knowing: Memory in the form perception pathway

Friday, May 18, 2018, 2:30 - 4:30 pm, Talk Room 2 Organizer(s): Caitlin Mullin, Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of the Technology Presenters: Wilma Bainbridge, Timothy Brady, Gabriel Kreiman, Nicole Rust, Morgan Barense, Nicholas Turk-Browne The established view of perception and memory is that they are dissociable processes that recruit distinct brain structures, with visual perception focused on the ventral visual stream and memory subserved by independent deep structures in the medial temporal lobe. Recent work in cognitive neuroscience has challenged this traditional view by demonstrating interactions and dependencies between perception and memory at nearly every stage of the visual hierarchy. In this symposium, we will present a series of cutting edge studies that showcase cross-methodological approaches to describe how visual perception and memory interact as part of a shared, bidirectional, interactive network.

### 2:40 pm Memorability – predicting memory from visual information, and measuring visual information from memory

Speaker: Wilma Bainbridge, National Institute of Mental Health

# 2:55 pm The impact of perceptual encoding on subsequent visual memory

Speaker: Timothy Brady, University of California San Diego

# 3:10 pm Rapid learning of meaningful image interpretation

Speaker: Gabriel Kreiman, Harvard University

# 3:25 pm Beyond identification: how your brain signals whether you've seen it before

Speaker: Nicole Rust, University of Pennsylvania

### 3:40 pm Understanding what we see: Integration of memory and perception in the ventral visual stream

Speaker: Morgan Barense, University of Toronto

### 3:55 pm Hippocampal contributions to visual learning

Speaker: Nicholas Turk-Browne, Yale University

# S5 Visual remapping: From behavior to neurons through computation

#### Friday, May 18, 2018, 5:00 - 7:00 pm, Talk Room 1

Organizer(s): James Mazer, Cell Biology & Neuroscience, Montana State University, Bozeman, MT & Fred Hamker, Chemnitz University of Technology, Chemnitz, Germany

Presenters: Patrick Cavanagh, James Bisley, Fred Hamker, Julie Golomb, James Mazer

In this symposium we will discuss the neural substrates responsible for maintaining stable visual and attentional representations during active vision. Speakers from three complementary experimental disciplines, psychophysics, neurophysiology and computational modeling, will discuss recent advances in clarifying the role of spatial receptive field "remapping" in stablizing sensory representations across saccadic eye movements. Participants will address new experimental and theoretical methods for characterizing statiotemporal dynamics of visual and attentional remapping, both behavioral and physiological, during active vision and relate these data to recent computational efforts towards modeling oculomotor and visual system interactions.

#### 5:05 pm Remapping of object features: Implications of the two-stage theory of spatial remapping

Speaker: Julie Golomb, The Ohio State University, Columbus, OH

### 5:28 pm Predicting the present: saccade based vs motion-based remapping

Speaker: Patrick Cavanagh, Glendon College, Toronto, ON and Dartmouth College, Hanover, NH

# 5:51 pm How predictive remapping in LIP (but not FEF) might explain the illusion of perceptual stability

Speaker: James Bisley, Department of Neurobiology, David Geffen School of Medicine at UCLA, Los Angeles, California

### 6:14 pm Predictive attentional remapping in area V4 neurons

Speaker: James Mazer, Cell Biology & Neuroscience, Montana State University, Bozeman, MT

### 6:37 pm Neuro-computational models of spatial updating

Speaker: Fred Hamker, Chemnitz University of Technology, Chemnitz, Germany

# S6 Advances in temporal models of human visual cortex

Friday, May 18, 2018, 5:00 - 7:00 pm, Talk Room 2 Organizer(s): Jonathan Winawer, Department of Psychology and Center for Neural Science, New York University. New York, NY Presenters: Christopher J. Honey, Anthony Stigliani, Jingyang Zhou, Geoffrey K. Aguirre

How do multiple areas in the human visual cortex encode information distributed over time? We focus on recent advances in modeling the temporal dynamics in the human brain: First, cortical areas have been found to be organized in a temporal hierarchy, with increasingly long temporal windows from earlier to later visual areas. Second, responses in multiple areas can be accurately predicted with temporal population receptive field models. Third, quantitative models have been developed to predict how responses in different visual areas are affected by both the timing and content of the stimulus history (adaptation).

### 5:10 pm Variation in Temporal Stimulus Integration Across Visual Cortex

Speaker: Geoffrey K. Aguirre, Department of Neurology, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA Additional Authors: Marcelo G. Mattar; Princeton Neuroscience Institute, Princeton University, Princeton, NJ, David A. Kahn; Department of Neuroscience, University of Pennsylvania, Philadelphia, Pennsylvania, Sharon L. Thompson-Schill; Department of Psychology, University of Pennsylvania, Philadelphia, Pennsylvania

# 5:35 pm Temporal Hierarchies in Human Cerebral Cortex

Speaker: Christopher J. Honey, Department of Psychological & Brain Sciences, Johns Hopkins University. Baltimore, MD

Additional Authors: Hsiang-Yun Sherry Chien, Psychological and Brain Sciences, Johns Hopkins University; Kevin Himberger, Psychological and Brain Sciences, Johns Hopkins University

# 6:00 pm Modeling the temporal dynamics of high-level visual cortex

Speaker: Anthony Stigliani, Department of Psychology, Stanford University, Stanford, CA

Additional Authors: Brianna Jeska, Department of Psychology, Stanford University; Kalanit Grill-Spector, Department of Psychology, Stanford University

### 6:25 pm Dynamics of temporal summation in human visual cortex

Speaker: Jingyang Zhou, Department of Psychology, New York University. New York, NY

Additional Authors: Noah C. Benson, Psychology, New York University Kendrick N. Kay, Center for Magnetic Resonance Research, Department of Radiology, University of Minnesota, Twin Cities Jonathan Winawer, Psychology and Center for Neural Science, New York University

# Saturday Morning Talks

### Visual Search

Saturday, May 19, 8:15 - 9:45 am, Talk Room 1 Moderator: Karla Evans

21.11, 8:15 am **Textures as Global Signals of Abnormality in the Interpretation of Mammograms** Yelda Semizer, Melchi M Michel, Karla K Evans, Jeremy M Wolfe

21.12, 8:30 am Warning signals: speeding up ultra-rapid animal detection Olivier Penacchio, Julie M Harris

21.13, 8:45 am A foveated object detector that misses giant and misplaced targets in scenes Aditya Jonnalagadda, Arturo Deza, Miguel P. Eckstein

21.14, 9:00 am Predicting Ultimate Visual Search Competency from Initial Performance Patrick H Cox, Dwight J Kravitz, Stephen R Mitroff

21.15, 9:15 am Scene meaning and salience are suppressed during arbitrary visual search Taylor R. Hayes, John M. Henderson

21.16, 9:30 am Hybrid foraging meets navigation: Can augmented reality improve performance in real world search tasks? Hayden Schill, Farahnaz A. Wick, Matthew S. Cain, Jeremy M. Wolfe

#### Attention: Features and objects

Saturday, May 19, 10:45 am - 12:30 pm, Talk Room 1

Moderator: Julie Golomb

22.11, 10:45 am The Effect of Resolution on Guiding Visual Selective Attention is Contingent Upon Task-Relevance Jared J Peterson, Lester C Loschky

22.12, 11:00 am Oscillatory Dynamics in Widespread Cortical Networks During Feature-Based Attention: Coupling Across and Between Frequencies Nina N Thigpen, Amy Trongnetrpunya, Jean Cibula, Aysegul Gunduz, Forest Gruss, Ke Bo, Enrico Opri, Mingzhou Ding, Andreas Keil

22.13, 11:15 am The neural dynamics of category-based attention Emily J Ward, Floris P de Lange

22.14, 11:30 am Attentional Selection of Multiple Correlation Ensembles Madison Elliott, Ronald Rensink

22.15, 11:45 am The attentional template shifts and sharpens in response to competition from target-similar distractors Xinger Yu, Joy J. Geng

22.16, 12:00 pm **Object-feature binding survives dynamic shifts of spatial attention** Emma Wu Dowd, Julie D Golomb

22.17, 12:15 pm Current and future goals are represented in opposite patterns in object-selective cortex Anouk M van Loon, Johannes J Fahrenfort, Christian N. L. Olivers

### Perceptual Learning: Basic

Saturday, May 19, 8:15 - 9:45 am, Talk Room 2

Moderator: Chaz Firestone

21.21, 8:15 am Endogenous spatial attention facilitates transfer of learning to untrained locations Ian Donovan, Marisa Carrasco

21.22, 8:30 am Mapping the effects of stimulus history on perception Nikos Gekas, Pascal Mamassian

21.23, 8:45 am Statistical learning generates implicit conjunctive predictions Ru Qi Yu, Jiaying Zhao

21.24, 9:00 am **Modeling the scientist in the crib** Nick Haber, Damian Mrowca, Li Fei-Fei, Daniel L.K. Yamins

21.25, 9:15 am Inducing Neural Plasticity and Perceptual Similarity via Real-Time fMRI Neurofeedback Marius Cătălin Iordan, Victoria J. H. Ritvo, Kenneth A. Norman, Nicholas B. Turk-Browne, Jonathan D. Cohen

21.26, 9:30 am Prior repulsion: "Anti-Bayesian" updating in visual cognition Steven Gross, Chaz Firestone

### Spatial Vision: Modeling and physiology

Saturday, May 19, 10:45 am - 12:30 pm, Talk Room 2 Moderator: Frank Tong

22.21, 10:45 am Similarity effects in peripheral vision: improved representation or cuing? Dian Yu, Ruth Rosenholtz

22.22, 11:00 am Polar coordinates as the format of spatial representation in visual perception Feitong Yang, Jonathan I Flombaum

22.23, 11:15 am Efficient coding of natural images with Nonlinear-Linear-Nonlinear cascade model Zhuo Wang, Xue-Xin Wei, Eero P Simoncelli

22.24, 11:30 am A spatial model of human retinal cell densities and solution for retinal ganglion cell displacement Michael A Barnett, Geoffrey K Aguirre

22.25, 11:45 am Two-photon imaging evidence for spatial frequency and orientation tuning in macaque V1 Shuchen Guan, Niansheng Ju, Shiming Tang, Cong Yu

22.26, 12:00 pm Cortical feedback mediates figure-ground modulation in the human lateral geniculate nucleus Sonia Poltoratski, Alexander Maier, Allen Newton, Frank Tong

22.27, 12:15 pm Despite a 100-fold drop in cortical magnification, a fixed-size letter is recognized equally well at eccentricities of 0 to 20 deg. How can this be? Denis G Pelli



### Development: Experience and disorders

Saturday, May 19, 8:30 am - 12:30 pm, Banyan Breezeway

23.301 Preserved cortical organization in the absence of early visual input Michael Arcaro, Peter F Schade, Margaret S Livingstone

23.302 Assessing the functional properties of primary visual cortex in the absence of extrastriate visual areas. Andre D Gouws, Holly D Brown, Rachel L Woodall, Antony B Morland

23.303 Posterior Cortical Atrophy: A longitudinal neurocognitive case study. Josee Rivest, David Tang-Wai

23.304 Visual response properties of neurons in V1, V2 and V4 of an amblyopic macaque. Brittany N Bushnell, Najib J Majaj, J Anthony Movshon, Lynne Kiorpes

23.305 Regional specialization of visual cortex in congenital blindness reveals takeover by multiple distinct top-down fronto-parietal inputs Shipra Kanjlia, Marina Bedny

23.307 Behavioral and Neural Changes in Early Visual Processing in an Animal Model of Schizophrenia Alexander Schielke, Bart Krekelberg

23.308 Relationship Between Iterative Visual Processing Deficits and Psychotic Symptoms Tori Espensen-Sturges, Philip C Burton, Scott R Sponheim, Cheryl A Olman

23.309 Psychophysical and fMRI Assessment of Magnocellular and Parvocellular Responses in Patients with Parkinson's Disease Claudia Feitosa-Santana, Liana Guerra Sanches, Daniel Quintela Bertuzzi, Edson Amaro Junior, Dora Fix Ventura

23.310 Atypical Basic Psychophysics in autism: Violation of Weber's law in vision and haptic Batsheva Hadad, Sivan Schwartz, Orit Nizri, Nof Harel

23.311 An eye for detail: Is spatial frequency processing a source for enhanced cortical functioning in people with autism spectrum disorder? Todd P Kamensek, Fakhri Shafai, Grace Iarocci, Ipek Oruc

23.312 Direct Neural Read-Out of Binocular Rivalry Dynamics in Autism using EEG Alina Spiegel, Jackson Lee, AJ Haskins, Nancy Kanwisher, Caroline E Robertson

23.314 The Effects of Glaucoma on Quality of Life in Canadian Seniors Lauren A King, Ken Fowler, James R Drover

23.315 Persistent Visual Impairment in Multiple Sclerosis: Prevalence and functional consequences. Rachel A McKay, Marianne EF Piano, Peter J Bex, Jennifer A Preston, Ben W Stansfield, Anita J Simmers

### Motion: Biological and flow

Saturday, May 19, 8:30 am - 12:30 pm, Banyan Breezeway

23.316 Serial dependence effect in heading perception from optic flow Qi Sun, David Alais, Huihui Zhang, Li Li

23.317 Statistical characterization of heading stimuli in natural environments using SLAM Christian B Sinnott, Tung Dang, Christos Papachristos, Kostas Alexis, Paul MacNeilage

23.318 The neural basis of actively controlled visually simulated self-motion Constanze Schmitt, Milosz Krala, Frank Bremmer

23.319 Heading Through A Crowd Hugh Riddell, Markus Lappe

# Saturday Morning Posters

23.320 Cortical areas that integrate motion and form cues for the perception of self-motion Shu-Guang Kuai, Zhe-Xin Xu, Jing Chen, Jia-Mei Li, David T Field, Li Li

23.321 Vection modulated by awareness to the own body Michiteru Kitazaki, Satoshi Fujisawa, Hyuga Tanimoto, Maki Sugimoto, Masahiko Inami

23.322 Curvilinear motion perception during visually simulated head turns in stereoscopic 3D virtual reality. Aden C Garnett, John A Perrone

23.323 Heading Perception Depends on Time-Varying Evolution of Optic Flow Charlie S Burlingham, David J Heeger

23.324 The contribution of viewpoint oscillations to the perception of distance travelled from optic flow Martin Bossard, Daniel Mestre

23.325 **Perception of Intentionality in Avatars and Al Agents** Serena De Stefani, Sam Sohn, Mubbasir Kapadia, Jacob Feldman, Peter Pantelis

23.326 Individual differences in the use of form and motion in the perception of sex in biological motion displays. Eric Hiris, William McLoughlin, Gaokhia Yang, Sean Conway

23.327 **Evidence that low IQ, but not schizophrenia, impairs motion integration** Brian P Keane, Yujia Peng, Docia Demmin, Steven M Silverstein, Hongjing Lu

23.328 Linking action words and body movements: Evidence from behavioral oscillations Hannah Lee, Joseph Burling, Hongjing Lu

23.329 Investigating the Genetics Underlying Human Biological Motion Perception: a Genome-wide Association Study Ren Na, Biqing Chen, Zijian Zhu, Yi Rao, Fang Fang

23.330 Behavioral oscillations reveal hierarchical representation of biological motion Yujia Peng, Hongjing Lu

23.337 Combined Functional and Structural Mapping of Superior Temporal Sulcus John A. Pyles, Emily D. Grossman, Austin I. Marcus, Michael J. Tarr

23.332 The 'Blindfold Test' for Deciding whether an Effect Reflects Visual Processing or Higher-Level Judgment Benjamin van Buren, Brian Scholl

23.333 **Perceiving animacy with causal constraints: A "leash resistance" effect in chasing detection** Haokui Xu, Ning Tang, Jifan Zhou, Rende Shui, Mowei Shen, Tao Gao

### Perception and Action: Reaching and grasping

Saturday, May 19, 8:30 am - 12:30 pm, Banyan Breezeway

23.334 Getting started with the MOTOM toolbox - an Optotrak-Matlab interface: From the first beeps to fingertip tracking in virtual reality Zoltan Derzsi, Robert Volcic

23.335 Adjusting visual illusions for differential sensitivity to target size decreases the likelihood of differentiating action from perception. Patrick J. Laflamme, Robert L. Whitwell, James T. Enns

23.336 Stereoacuity predicts total movement time in a fronto-parallel prehension task Angelica Godinez, Alyson L Kishi, Mariela E Hernandez, Preeti Verghese, Dennis M Levi

23.337 Visuomotor adaptation is sensitive to perceptual changes in depth information Carlo Campagnoli, Jordan A Taylor 23.338 The effect of losing or gaining visual information on movement performance when reaching for haptic targets. Ivan Camponogara, Robert Volcic

23.339 Sensory feedback reduces scalar variability in grasping Ailin Deng, Evan Cesanek, Fulvio Domini

23.340 How do vision and haptics combine in multisensory grasping? Robert Volcic, Ivan Camponogara

23.341 Grasping modulates unconscious processing of manipulable objects Wenyuan Yu, Ye Liu, Xiaolan Fu

23.342 Active visuomotor interactions with virtual objects are intruded by perceptual processing Aviad Ozana, Tzvi Ganel

23.343 Semantics determine the influence of allocentric information in memory-guided reaching Harun Karimpur, Katja Fiehler

23.344 Visual-motor mapping in VR: Detection thresholds for distortions of hand position Siavash Eftekharifar, Niko Troje

23.345 Visually guided unimanual and bimanual reaching rely on different cognitive mechanisms: Evidence from optic ataxia Celia P Litovsky, Feitong Yang, Zheng Ma, Jonathan Flombaum, Michael McCloskey

23.346 Beyond sensory processing: Human neuroimaging shows task-dependent functional connectivity between V1 and somatomotor areas during action planning Jena Velji-Ibrahim, J. Douglas Crawford, Simona Monaco

23.347 Decoding the electrophysiological dynamics of visual-to-motor transformations during grasp planning and execution Lin Guo, Adrian Nestor, Dan Nemrodov, Matthias Niemeier

23.348 **Decoding action intention from the activity pattern in the Foveal Cortex** Simona Monaco, Giulia Malfatti, Laura Pizzato, Luigi Cattaneo, Luca Turella

23.349 Strong optic flow enables accurate and stable perception of metric shape despite blurry vision Yani Chen, Jing Samantha Pan

#### Perceptual Organization: Ensembles, averaging, numerosity

Saturday, May 19, 8:30 am - 12:30 pm, Banyan Breezeway

23.350 Ensemble-based segmentation in the perception of multiple feature conjunctions Vladislav A Khvostov, Igor S Utochkin

23.351 Effect of spatiotemporally changing environment on serial dependence in ensemble representations Son Sangkyu, Kim Yee-Joon

23.352 Reciprocal Interference between Global and Local Processing in Ensemble Perception Dilakshan Srikanthan, Marco A Sama, Sol Z Sun, Adrian Nestor , Jonathan S Cant

23.353 Ensemble perception of centers of inferred shapes vs. centers of item positions Matthew S Cain, Sasen S Cain, Dawn M Wendell

23.354 Ensemble Statistics are (only) Accessed through Proxies: Range and Spatial Texture Heuristics in Variability Discrimination Jonas S.-H. Lau, Timothy F Brady

23.355 Ensemble representations are robust to noise inherited from the individual item level Emma ZeeAbrahamsen, Jason Haberman

23.356 **Representational dynamics of ensemble average of simultaneously presented objects** Kangyong Eo, Oliver James, Sangkyu Son, Min-Suk Kang, Sang Chul Chong, Yee-Joon Kim

23.357 Conceptual size ensembles cannot be predicted by individual item size representations Sneha Suresh, Jason Haberman

23.358 **Representation of multiple ensembles across visual domains is more precise than within visual domains** Delaney McDonagh, Jason Haberman

23.359 Interactions between statistical set representations and visual stability Jaap Munneke, Jennifer E Corbett

23.360 The end of motion: How the structure of simple visual events impacts working memory and enumeration Joan Danielle K Ongchoco, Brian Scholl

23.367 **Dissociating Parallel and Serial Processing of Numerical Value** Kassandra R Lee, Kenith V. Sobel, A. Kane York, Amrita M. Puri

23.362 Confusing the Trees for the Forest: Number Estimation in Real-World Scenes Darko Odic

23.363 **Dynamics of numerosity representation in early visual cortex.** Michele Fornaciai, Joonkoo Park

23.364 A distributed attention model of mean size perception Sang Chul Chong, Jongsoo Baek

23.366 Emotional judgments of individual scenes are influenced by unintentional averaging Yavin Alwis, Jason Haberman

23.367 Gestalt grouping facilitates perceptual averaging to boost memory efficiency Jennifer E Corbett, Ceren Okatan, Jaap Munneke

### Multisensory Processing: Vision, haptics, body image

Saturday, May 19, 8:30 am - 12:30 pm, Banyan Breezeway

23.368 **Teaching visual orientation discrimination through tactile learning** Dingzhi Hu, Guozhen Liu, Lihan Chen, Cong Yu

23.369 Multisensory Detection: Using Vision and Haptics to detect hidden objects. Julie B Skevik, Peter Scarfe

23.370 **The Sequential-Weight Illusion** Guido Maiello, Vivian C Paulun, Lina K Klein, Roland W Fleming

23.371 **Quantifying the contribution of visual and haptic feedback to the size-weight illusion: a meta-analytic review** Elizabeth J Saccone, Oriane Landry, Philippe A Chouinard

23.372 Vision and touch are not automatically integrated Stephanie Badde, Karen T Navarro, Michael S Landy

23.373 Feeling a flash Michael Landy, Stephanie Badde

23.374 Crossmodal correspondence between haptic shape and sound Yuna Kwak, Ho-Sung Nam, Chai-Youn Kim

23.375 Consistency of Individual Measurements Between Different Sensory Modalities: Vision vs. Audition and the Haptic Senses Russell Adams, Michele Mercer, Jagger Mercer/Adams

23.376 Sensorimotor finger-specific information in the cortex of the congenitally blind Daan B Wesselink, Sanne Kikkert, Holly Bridge, Tamar R Makin

23.377 Where am I? In terms of my physical and of my perceived body Albert H van der Veer, Matthew R Longo, Adrian JT Alsmith, Hong Yu Wong, Heinrich H Bülthoff, Betty J Mohler

### 23.378 Distortions of Body Image in Healthy Adults: A Meta-Analysis Matthew R Longo

23.379 No change in perceived hand size after Rubber Hand Illusion induction Sam Thomasson, Jason Haberman

### Visual Memory: Neural correlates

Saturday, May 19, 8:30 am - 12:30 pm, Pavilion

23.401 A Frontotemporal Regional Model of Post-Traumatic Stress Disorder Catherine A Mikkelsen, Arash Yazdanbakhsh

23.402 Integrated Cognitive Assessment: Speed and Accuracy of Visual Processing as a Proxy to Cognitive Performance Seyed-Mahdi Khaligh-Razavi, Sina Habibi, Elham Sadeghi, Chris Kalafatis

23.403 Perceptually-matched images that are meaningful are remembered better and result in increased CDA in visual working memory Isabel Asp, Viola S Störmer, Timothy F Brady

23.404 **Functional and anatomical characterization of visual working memory coding** Diego Mendoza-Halliday, Santiago Torres, Robert Desimone, Julio Martinez-Trujillo

23.405 The functional role of alpha-band oscillations for the retro-cueing benefit in visual working memory. Wanja A Mössing, Niko A Busch

23.406 Alpha-band activity tracks dynamic changes in the contents of visual working memory. Laura Rodriguez, Asal Nouri, Edward Ester

23.407 Evidence for concurrent activation of sequentially encoded spatial locations David W Sutterer, Edward Awh

23.408 Spatially local activity-silent working memoryh representations in human cortex. Edward Ester

23.409 Examining distinct neural signals that track the contents of working memory Gisella K Diaz, Edward K Vogel, Edward Awh

23.410 ABC, Easy as CDA: The contralateral delay activity robustly tracks the storage of letters in visual working memory Jane A Burton, Jason Rajsic, Geoffrey F Woodman

23.411 **Neural measures accounting for flexibility in VSTM** Holly A Lockhart, Susanne Ferber, Stephen M Emrich

23.412 **Temporal dynamics of visual working memory representations across human cortex** Thomas C Sprague, Wei Ji Ma, Clayton E Curtis

23.413 But wait, there's more! Six bilateral sensory-biased regions in human frontal cortex. Abigail Noyce, Sean M. Tobyne, Samantha W. Michalka, Barbara G. Shinn-Cunningham, David C. Somers

23.414 Dynamic reconfiguration of global network and regional functional connectivity when comprehending visual narratives Hayoung S Song, Bo-yong Park, Hyunjin Park, Won Mok Shim

23.415 **The neural basis of binding errors in visual working memory** Kartik K Sreenivasan, Ainsley Temudo, Vahan Babushkin

23.416 Frontal visual field maps mediate noise resilience of working memory clayton e curtis, wayne e mackey

23.417 Frontal and parietal cortex make distinct contributions to the storage and allocation of resources that support WM Grace E. Hallenbeck, Alfredo D. Bolaños, Thomas C. Sprague, Clayton E. Curtis

23.418 The benefits of combined brain stimulation and cognitive training: a pilot study Sara Assecondi, Kimron L Shapiro

### 3D Perception: Mechanisms and models

Saturday, May 19, 8:30 am - 12:30 pm, Pavilion

23.419 Generalized representation of stereoscopic surface in V3A Zhen Li, Hiroaki Shigemasu

23.420 **7T fMRI reveals ocular dominance layers of the human LGN** Yazhu Qian, Peng Zhang

23.421 Columnar Neural Mechanisms Underlying Vertically Asymmetric Global Visual Processing shahin nasr, Roger B.H. Tootell 23.422 Contextual feedback to V1 neurons shapes binocular matching Reuben Rideaux, Andrew E Welchman

23.423 **Depth from Motion Parallax is Disambiguated by Pursuit Eye Movements in the Absence of Vertical Perspective** Shanda Lauer, Mark Nawrot

23.424 **Temporal properties of persistence and change in perceived depth from motion parallax** Mark Nawrot, Breanna Thompson, Shanda Lauer

23.425 Orientation tuning for spatial vision and stereopsis: Factor analysis of individual differences in contrast and disparity thresholds Ignacio Serrano-Pedraza, Douglas J. Boegaerts, Jenny C. A. Read, David H. Peterzell

23.426 **The visual kinetic depth effect is altered with Parkinson's disease** Keith D White, Frank M Skidmore, Kenneth M Heilman

23.427 Use of local image information in depth edge classification by humans and neural networks Krista A Ehinger, Wendy J Adams, Erich W Graf, James H Elder

23.428 Modeling 3D Slant Perception: Bootstrapping 3D Affine Structure to Euclidean Xiaoye M Wang, Mats Lind, Geoffrey P Bingham

23.429 **3D motion direction estimation – Model predictions and data** Kathryn Bonnen, Thaddeus Czuba, Jake A Whritner, Austin C Kuo, Alexander C Huk, Lawrence K Cormack

23.430 Dissociations in ideal and human observer visual search in 3D images Miguel Angel Lago Angel, Craig K Abbey, Miguel P Eckstein

23.431 Stereo Slant Estimation of Planar Surfaces: Standard Cross-Correlation vs. Planar-Correlation Can Oluk, Kathryn Bonnen, Johannes Burge, Lawrence K Cormack, Wilson S Geisler

23.432 **The effect of interocular contrast on disparity tuning in primary visual cortex** Laura Palmieri, Sid Henriksen, Jenny C.A. Read, Bruce G. Cumming

23.433 Individual differences: On the possible relativity of spatial-frequency-tuned stereoscopic processes underlying disparity threshold functions David H Peterzell, Jenny C.A. Read, Ignacio Serrano-Pedraza

23.434 Spatial pooling of local Bayes-optimal estimates predicts human 3D tilt estimation in natural scenes Seha Kim, Johannes Burge

# Scene Perception: Categorization and memory

Saturday, May 19, 8:30 am - 12:30 pm, Pavilion

23.435 Totally-Looks-Like: A Dataset and Benchmark of Semantic Image Similarity Amir Rosenfeld, Markus Solbach, John K. Tsotsos

23.436 **Spatial frequency tuning for outdoor scene categorization** Verena Willenbockel, Sandro Wiesmann, Frédéric Gosselin, Melissa L.-H. Võ

23.437 Identifying Diagnostic Features in Rapid Affective Image Categorization L. Jack Rhodes, Matthew Ríos, Jacob Williams, Gonzalo Quinones, Prahalada Rao, Vladimir Miskovic

23.438 **Miniature models and immersion: A failed replication** Shane P Baker, Matt Moran, Derek McClellan, D. Alexander Varakin

23.439 **Concavity and convexity of conjoint surfaces underlie neural and behavioral categorization of scenes and objects** Ruu Harn Cheng, Dirk B Walther, Soojin Park 23.440 Human-Centered Categorization of Natural Scenes Matt D Anderson, Wendy J Adams, Erich W Graf, Krista A Ehinger, James H Elder

23.441 **Do Scene-Category Primes Facilitate Scene Perception?** Thomas Sanocki, Jack Defant, Grace MacKay, Dana Zipprer

23.442 **"Scene layout" priming relies primarily on low-level features rather than scene layout** Anna Shafer-Skelton, Timothy F Brady

23.443 Scene Gist Narrative Priming: Sequential expectations influence scene gist recognition performance Maverick E Smith, Lester C Loschky

23.444 Evidence for scene gist priming: Seeing a "Cooking" scene facilitates categorization of future "Cooking" actions Adam M Larson, Karissa B Payne

23.445 Scene gist gets through the bottleneck of visual crowding better than facial expression and orientation Mingliang Gong, Leonard James Smart

23.446 Fifty Years of Rapid Serial Visual Presentation: Is Visual Perception Changing Over Time? Michelle R Greene, Priyanka Takle

23.447 Doing physics by eye and by hand: Mouse tracking reveals reflexive visual processing of physical scenes Patrick C Little, Chaz Firestone

23.448 Alexithymia and the processing of emotional scenes depicting implied motion Sarah N Rigby, Lorna S Jakobson, Brenda M Stoesz

23.449 **Training expertise in scene recognition** Birken T Noesen, Joseph D Borders, Assaf Harel

23.450 What sustains viewer interest in a natural scene? Bhavin Sheth, King Hei Fung, Mariam Ismail, Mirza Baig

23.451 Dynamics of aesthetic experience are reflected in the default-mode network Edward A Vessel, Amy Belfi, Aenne Brielmann, Ilkay Isik, Anjan Chatterjee, Helmut Leder, Denis G. Pelli, G. G. Starr

23.452 **From pixels to moral judgment: Extracting morally relevant information in minds and machines** Julian De Freitas, Alon Hafri, Daniel LK Yamins, George A Alvarez

23.453 The Influence of Environmental Features on Egocentric Distance Judgments in Virtual Rendered Scenes Lindsay Houck, John Philbeck

### Faces: Recognition and perception

Saturday, May 19, 8:30 am - 12:30 pm, Pavilion

23.454 **The face-number effect: a new test of face discrimination** Sarra Djouab, Shanna Yeung, Andrea Albonico, Sherysse Corrow, Jason JS Barton

23.455 Understanding Information Processing Mechanisms for Face Categorizations in Deep Neural Networks Oliver G B Garrod, Tian Xu, Philippe G Schyns

23.456 **Face recognition in humans and machines** Naphtali Abudarham, Lior Shkiller, Galit Yovel

23.457 **Testing the limits of identity recognition with mixed-identity faces** Isabelle Buelthoff, Mintao Zhao

23.458 **How Many Faces Can We Recognize?** Emily X Meschke, Catrina M Hacker, Irving Biederman

23.459 **Faces as spectra: implications for adaptation and face coding** Alexandra K Aniban, Kara J Emery, Courtney Matera, Michael A Webster

23.460 **Recognition of Stretched Faces** Catrina M Hacker, Emily X Meschke, Irving Biederman

23.461 Blurry faces are easier to recognize when viewed small Ipek Oruc, Morteza Mousavi

23.462 The effects of blur and inversion on sorting ambient face images by identity Hannah I Pearson, Jacob Gable, Benjamin Balas

23.463 Inversion leads to qualitative changes in face processing but not in word processing Andrea Albonico, Amanda Furubacke , Jason JS Barton, Ipek Orc

23.464 **A strong bias to fixate the upper eye in tilted faces** Nicolas Davidenko, Hema Kopalle, Bruce Bridgeman

23.465 **Is Body Size Estimation Viewpoint Invariant?** Anne Thaler, Isabelle Bülthoff, Sergi Pujades, Michael J. Black, Betty J. Mohler

23.466 Holistic gist: The speed of holistic face processing James W Tanaka, Buyun Xu

23.467 The Impact of Viewing Time to Internal Facial Features on Face Recognition Performance Following Implicit and Explicit Encoding Karisa B Parkington, Roxane J Itier

23.468 Looking at faces is differentially modulated by context and novelty Effie J Pereira, Elina Birmingham, Jelena Ristic

23.469 Human faces capture attention and attract first saccades without longer dwell times M.D. Rutherford, Marcus Morrisey, Ruth Hofrichter

23.470 Independent mechanisms for ensemble processing of face viewpoint and identity Marco A Sama, Adrian Nestor, Jona-than S Cant

23.471 **Encoding the Naturalness of Crowds** Megan Dorn, Allison Y Leib, David Whitney

23.472 A visual search advantage for illusory faces in inanimate objects Robert T Keys, Jessica Taubert, Susan G Wardle

### Color and Light: Lightness and brightness

Saturday, May 19, 8:30 am - 12:30 pm, Pavilion

23.473 A computational mid-level model of lightness perception Richard F Murray

23.474 Investigation of Lightness Illusions in Artificial Neural Networks Leslie Wöhler, Marcus Magnor

23.475 Contrast dependent brightness shift induced by contextual motion Sang Wook Hong, Min-Suk Kang

23.476 Brightness Induction Enhancements and Limitations at Low Frequency Modulations Across a Variety of Stimulus Contexts Arash Yazdanbakhsh, Louis Vinke

23.477 Using conjoint measurement to estimate scales of perceived surface lightness Guillermo Aguilar, Marianne Maertens

23.478 **The effects of context on face lightness perception** Yin Yan Cheang, Dorita H. F. Chang

Saturday AM



### Perception and Action: Performance

Saturday, May 19, 2:30 - 4:15 pm, Talk Room 1 Moderator: Stephanie Rossit

24.11, 2:30 pm **Predicting how we grasp arbitrary objects** Lina K Klein, Guido Maiello, Daria Proklova, Juan Chen, Vivian C Paulun, Jody C Culham, Roland W Fleming

24.12, 2:45 pm Planning ahead: preparatory EEG activity predicts voluntary actions when the goal is not immediately accessible to perception Ori Ossmy, Brianna E Kaplan, Danyang Han, Melody Xu, Roy Mukamel, Karen E Adolph

24.13, 3:00 pm Decoding typical (but not atypical) actions with real tools from both dorsal and ventral visual stream regions Ethan Knights, Fraser W. Smith, Courtney Mansfield, Diana Tonin, Holly Weaver, Jenna Green, Janak Saada, Stephanie Rossit

24.14, 3:15 pm The visual control of walking over terrain with multiple raised obstacles Brett Fajen, Sean L Barton, Scott T Steinmetz

24.15, 3:30 pm Measurement noise explains lack of full adaptation without the need of forgetting: evidence from temporal delays. Elisabeth B. Knelange, Joan López-Moliner

24.16, 3:45 pm Impairment of "vision for action" functions in the newly sighted, following early-onset and prolonged visual deprivation Ehud Zohary, Itay Ben Zion, Caterin Schreiber, Ayelet McKyton

24.17, 4:00 pm Investigating the Differences in Predictive Oculomotor Strategies using Long Short-Term Memory Recurrent Neural Network Models Kamran Binaee, Rakshit S Kothari, Jeff B Pelz, Gabriel J Diaz

### Faces: Emotion and social cues

Saturday, May 19, 5:15 - 6:45 pm, Talk Room 1 Moderator: Galia Avidan

25.11, 5:15 pm Facial Color Is an Efficient Mechanism to Visually Transmit Emotion Aleix M Martinez, Carlos F Benitez-Quiroz, Ramprakash Srinivasan

25.12, 5:30 pm Emotion Algebra reveals the richness of meanings of facial expressions Carmel Sofer, Dan Vilenchik, Ron Dotsch, Galia Avidan

25.13, 5:45 pm **Race at First Sight** Sasha Lasrado, Nayla Sokhn, Kanji Tanaka, Katsumi Watanabe, Roberto Caldara

25.14, 6:00 pm Neural correlates of group bias during natural viewing Timothy J Andrews, Philip IN Ulrich, Ryan K Smith, Richard L Hoggart, Andre Gouws

25.15, 6:15 pm Neural processing of others' gaze independent of specific facial features Colin J Palmer, Kiley Seymour, Yumiko Otsuka, Colin WG Clifford

25.16, 6:30 pm Gaze cueing is tuned to extract the mind behind the gaze: Investigations of 'gaze deflection' Clara Colombatto, Yi-Chia Chen, Brian Scholl

# Saturday Afternoon Talks

### Visual Working Memory

Saturday, May 19, 2:30 - 4:15 pm, Talk Room 2 Moderator: Roy Luria

24.21, 2:30 pm An object-based pointer system in visual working memory Halely Balaban, Trafton Drew, Roy Luria

24.22, 2:45 pm Attention fluctuates rhythmically between objects in working memory Benjamin Peters, Benjamin Rahm, Jochen Kaiser, Christoph Bledowski

24.23, 3:00 pm Episodic Memory Replaces Active Maintenance in Working Memory When Available Mark W Schurgin, Corbin A Cunningham, Howard E Egeth, Timothy F Brady

24.24, 3:15 pm Visual Search Within Working Memory Garry Kong, Daryl Fougnie

24.25, 3:30 pm Memory load modulates the dynamics of visual working memory. Matthew F Panichello, Brian D DePasquale, Jonathan W Pillow, Timothy J Buschman

24.26, 3:45 pm **Optimal change detection without ensemble statistics** William J Harrison, Paul M Bays

24.27, 4:00 pm Hemifield-specific control mechanisms for spatial working memory and attention: evidence from hemifield crossover costs. Roger W Strong, George A Alvarez

### Eye Movements: Neural mechanisms

Saturday, May 19, 5:15 - 6:45 pm, Talk Room 2 Moderator: Melissa Võ

25.21, 5:15 pm Free-viewing fixation related EEG-potentials with continuous-time regression Tim Cornelissen, Jona Sassenhagen, Melissa L.-H. Võ

25.22, 5:30 pm Extra-retinal mechanisms as compensation for retinal-circuit-level visual masking effects in saccadic suppression Saad Idrees, Felix Franke, Ziad M Hafed, Thonas A Münch

25.23, 5:45 pm Microcircuitry of visual performance monitoring in the supplementary eye field: Laminar distribution of error and reward processing. Amirsaman Sajad, Jeffrey D Schall

25.24, 6:00 pm Microcircuitry of visual performance monitoring in the supplementary eye field: Laminar distribution of visual processing under conflict Steven P Errington, Amirsaman Sajad, Jeffrey D Schall

25.25, 6:15 pm Dynamic remapping in Monkey Frontal Eye Field preserves a retinotopic representation during visual search, then compresses space toward the search target. Daniel K Wood, Pavan Ramkumar, Joshua L Glaser, Patrick N Lawlor, Konrad P Körding, Mark A Segraves

25.26, 6:30 pm Cortical Control of Eye Movements in Natural Tasks Jessica E Goold, Wonil Choi, John M Henderson

# Saturday Afternoon Posters

### **Spatial Vision: Models**

Saturday, May 19, 2:45 - 6:45 pm, Banyan Breezeway

26.301 Aberrant Population Receptive Fields in Albinism Ethan J Duwell, Melissa A Wilk, Jed Mathis, Joseph Carroll, Edgar A DeYoe

26.302 **Optimizing stimulation protocols for prosthetic vision based on retinal anatomy** Michael Beyeler, Devyani Nanduri, James D Weiland, Ariel Rokem, Geoffrey M Boynton, Ione Fine

26.303 Title: Convolutional Network Approach to Modelling Allocentric Landmark Impact on Target Localization Sohrab Salimian, Richard P. Wildes, John D. Crawford

26.304 **Spatial Summation in Noise** Yu-Hsin Yeh, Chien-Chung Chen, Christopher W Tyler

26.305 Variable slope of the psychometric function for different spatial frequencies measured by the Tuebingen Contrast Sensitivity Test Tim Schilling, Alexander Leube, Arne Ohlendorf, Siegfried Wahl

26.306 Inferring the shape of decision variable distributions from psychometric functions Johannes Burge

26.307 The Contrast Sensitivity Function in children: Bayesian adaptive estimation using QUEST+ Mahtab Farahbakhsh, Tessa M Dekker, Pete R Jones

26.308 Decision-Variable Correlation: An Extension of SDT Wilson S Geisler, Stephen Sebastian

26.309 Towards a computational observer model of perceptual performance fields Eline R Kupers, Marisa Carrasco, Jonathan Winawer

26.310 Prior Experiences Influence Target Localization in Centroid Tasks Jocelyn K Lopez, Jordan Ali Rashid, Charles C Chubb

26.311 MaxFind: an efficient method for psychological scaling of large stimulus sets Isamu Motoyoshi, Saya Kashiwakura

26.312 The HCP 7T Retinotopy Dataset: A new resource for investigating the organization of human visual cortex Noah C Benson, Keith W Jamison, An T Vu, Jonathan Winawer, Kendrick N Kay

### Color and light: Surfaces, illuminants, materials

Saturday, May 19, 2:45 - 6:45 pm, Banyan Breezeway

26.313 Influence of natural illumination changes on hue statistics in natural scenes Kinjiro Amano, Sérgio M. C. Nascimento

26.374 Influence of the diffuseness of illumination on color appearance Yoko Mizokami, Wataru Nozaki, Hirohisa Yaguchi

26.315 **The neighbouring chromaticity influences the judged intensity of illumination** Eli Brenner, Ruben C Pastilha, Sérgio Nascimento

26.316 Adaptation and perceived contrast in natural vs widecolor-gamut lighting Ivana Ilic, Lorne Whitehead, Yoko Mizokami, Michael Webster

26.317 Illumination Colour, Texture, and the Appearance of Glow Khushbu Y Patel, Richard F Murray

26.378 **#TheDress type of color ambiguity induced by T-shirt image based on physically-based rendering** Kai Shiromi, Higashi Hiroshi, Mohammad Shehata, Shinsuke Shimojo, Shigeki Nakauchi



26.320 Hue Flows and Shading Flows: emergent properties from their interaction Steven W Zucker, Emma Alexander, Daniel Holtmann-Rice, Benjamin Kunsberg, Roland Fleming

26.321 Visual perception of liquids in motion Matjaz Jogan, Jeffrey Martin

26.322 The misperception of opacity, reflectance, and 3D shape Phillip J Marlow, Barton L Anderson

26.323 **Does geometric sharpness affect perception of translucent material perception?** Bei Xiao, Shuang Zhao, Ioannis Gkioulekas, Wenyan Bi, Kavita Bala

26.324 Visual Perception of Deformable Materials Vivian C Paulun, Filipp Schmidt, Roland W Fleming

26.325 **Distinguishing Mirror from Glass** Hideki Tamura, Konrad E Prokott, Roland W Fleming

26.326 **Visual sensitivity to material differences** Matteo Toscani, Dar'ya Guarnera, Giuseppe Claudio Guarnera, Jon Yngve Hardeberg, Karl R Gegenfurtner

26.327 ShapeToolbox: Creating 3D models for vision research Toni P Saarela

#### Eye Movements: Faces, objects, scene recognition

Saturday, May 19, 2:45 - 6:45 pm, Banyan Breezeway

26.328 Perception of gaze direction using 3D virtual reality displays. Effect of Sclera and Head Orientation. Diego Buitrago-Piza, Hitarth Dalal, Borna Mahmoudian, Rob Nicolson, Julio Martinez-Trujillo

26.329 Eye Movement Patterns in Face Recognition are Associated with Cognitive Decline in Older Adults: An HMM Approach Cynthia Y.H. Chan, Antoni B. Chan, Tatia M.C. Lee, Janet H. Hsiao

26.330 The development of processing face race and face sex in childhood. Stefania Conte, Ryan Barry-Anwar, Lisa Scott

26.337 **Peripheral cues guiding the first eye movement to faces** Xiao(Nicole) Han, Puneeth N. Chakravarthula, Miguel P. Eckstein

26.332 Stimulus and Cognitive Factors Influence the Spectatorship of Portraits Tobiasz R Trawinski, Natalie Mestry, Beth Harland, Nick Donnelly

26.333 **Causal influence of object representations on eye movements** Marek A. Pędziwiatr, Elisabeth von dem Hagen, Christoph Teufel

26.334 Category-specific guidance of gaze in photographs and line drawings Claudia Damiano, John Wilder, Dirk B. Walther

26.335 Semantic and Functional Relationships Among Objects Bias Gaze Control Andrew Clement, Ryan E O'Donnell, James R Brockmole

26.336 **Temporal priority of gaze during natural scene viewing** Kazuaki Akamatsu, Yoichi Miyawaki

26.337 Oculomotor and Perceptual Adaptation to Natural Scenes Statistics Agostino Gibaldi, Martin S Banks

26.338 **Predictions Guide Gaze in Scene Search** Steven G Luke, Benjamin Jafek

26.339 Spatial working memory impedes search efficiency in interrupted but not continuous scene search Mark Mills, Matthew D Hilchey, Jay Pratt

26.340 Eye movement data of large-scale crowdsourced driving videos reveal distinct driver gaze patterns for different object categories Ye Xia, Karl Zipser, Ken Nakayama, David Whitney

26.341 Visuo-attentional strategies in road crossing situations across the lifespan Victoria I Nicholls, Jan Wiener, Geraldine Jean-Charles, Peter de Lissa, Junpeng Lao, Roberto Caldara, Sebastien Miellet

26.342 **Discovery of activities via statistical clustering of fixation patterns** Jeffrey B Mulligan

26.343 Watchers Do Not Follow the Eye Movements of Walker Michael Papinutto, Denis Lalanne, Roberto Caldara

### Spatial Vision: Neural mechanisms

Saturday, May 19, 2:45 - 6:45 pm, Banyan Breezeway

26.344 Spatially specific delay period activity in the human superior colliculus. Kevin DeSimone, Kartik K Sreenivasan, Clayton E Curtis

26.345 **Contrast gain control and functional architecture in macaque V1** Jenna G Kelly, Christopher Shooner, Luke E Hallum, J Anthony Movshon, Michael J Hawken

26.346 Characterizing Non-Linear Processes in Cross-Orientation Suppression (XOS) with Steady-State Visual Evoked Potentials (SSVEPs) Bruno Richard, Ravi Sojitra, Bruce C Hansen, Patrick Shafto

26.347 Enhanced Alpha-mediated inhibition on target when it is crowded by flankers Qiming Han, Jianrong Jia, Huan Luo

26.348 **Stimulus dependence of population receptive fields within the visual field maps and the visual word form area** Rosemary K Le, Chen Gafni, Michal Ben-Shachar, Brian Wandell

26.349 Effects of Transcranial Electric Stimulation to Early Visual Areas on Regional BOLD fMRI Activity During Visual Task Keishi Nomura, Shuhei Shima, Kristina M Visscher, Aaron Seitz, Yuko Yotsumoto

26.350 Measuring cortical temporal contrast sensitivity across population receptive field (pRF) eccentricity and sizes using fMRI Marc M Himmelberg, Alex R Wade

26.351 Efficient Mapping of Spatial Frequency Sensitivity in Human Visual Cortex Sara Aghajari, Sam Ling

26.352 Mapping Spatial Frequency Preferences in the Human Visual Cortex William F Broderick, Noah C Benson, Eero P Simoncelli, Jonathan Winawer

26.353 **The Neural Correlate Of Size Constancy Measured With SSVEP In Virtual Reality** Meaghan McManus, Jing Chen, Laurence R Harris, Karl R Gegenfurtner

### Perceptual Learning: Perception and performance

Saturday, May 19, 2:45 - 6:45 pm, Banyan Breezeway

26.354 REM sleep facilitates post-sleep visual perceptual learning (VPL) by eliminating anterograde interference from pre-sleep VPL Masako Tamaki, Aaron V Berard, Takeo Watanabe, Yuka Sasaki 26.355 Evaluating the performance of the staircase and quick Change Detection methods in measuring perceptual learning Zhong-Lin Lu, Pan Zhang, Yukai Zhao, Barbara A Dosher

26.356 Spatial selectivity of tilt aftereffect depends on long-term history Ron Dekel, Dov Sagi

26.357 Idiosyncratic directional preferences in ambiguous perception are not modified to reduce ambiguity Alexander C Schütz, Byung-Woo Hwang

26.358 **Contingent adaptation in masking and surround suppression** Hörmet Yiltiz, David J. Heeger, Michael S. Landy

26.359 **Learning Complex Texture Discrimination** Jessica C Herrington, Ted Maddess, Dominique Coy, Corinne F Carle, Faran Sabeti, Marconi Barbosa

26.360 Task irrelevant statistical regularities modulate perceptual learning in orientation discrimination task Jozsef Fiser, Gabor Lengyel

26.361 **Higher Order Structure in Visual Statistical Learning** Anna Leshinskaya, Sharon L Thompson-Schill

26.362 Visual processing during false alarms indicates how short-term expectation shapes perception Christoph Teufel

26.363 **Representing color and orientation ensembles: Perceptual learning of multiple feature distributions** Sabrina Hansmann-Roth, Andrey Chetverikov, Árni Kristjánsson

26.364 Variability influences generalization in implicit learning of spatial configurations Yoko Higuchi, Yoshiyuki Ueda, Jun Saiki

26.365 **Attention Restoration Through Virtual Environments** Mohammed F Islam, Michael J Kleiman, Elan Barenholtz

26.366 Automatic prospective and retrospective activation of object representations during statistical learning Yu Luo, Jiaying Zhao

26.367 Relative efficacy of global motion versus contrast training early after stroke for recovering contrast sensitivity in cortical blindness Elizabeth L Saionz, Duje Tadin, Krystel R Huxlin

26.368 Binocular fusion during rivalry increases after short term monocular deprivation Yasha Sheynin, Sebastien Proulx, Robert F Hess

26.369 Attention cueing and task relevant perceptual learning Kieu Nguyen, Takeo Watanabe, George J Andersen

26.370 **Dyadic perceptual learning of orientation discrimination** Yifei Zhang, Fang Fang, Yizhou Wang

26.371 Coordinated Attentional Training promotes generalization of learning in healthy and MD subjects Marcello Maniglia, Mandy K Biles, Kristina M Visscher, Aaron R Seitz

26.372 **Training to Use Peripheral Vision Does Not Improve Attentional Shifts** Mandy K Biles, Ishant S Yadav, Brody DeSilva, Rong Liu, Kristina M Visscher

26.373 Non-symbolic division ability mediates the relation between visual number discrimination acuity and symbolic math skill Emily M Szkudlarek, Elizabeth M Brannon

26.374 Sensorimotor effects following exposure to illusory stimuli Alla Cherniavskaia, Valeria Karpinskaia, Vsevolod Lyakhovetskii

26.375 **Exploring a new method to improve facial emotion recognition** Carlijn van den Boomen, Sjoerd M. Stuit, Chantal Kemner

26.376 Motor skill consolidation facilitates perceptual learning shira klorfeld, Nitzan Censor

26.377 **Cross-cultural differences in perceptual learning** Eirini Mavritsaki, Stephanie Chua , Zoe Kourtzi, Maxine Lintern, Panagiotis Rentzelas

### Visual Search: Features and cues

Saturday, May 19, 2:45 - 6:45 pm, Pavilion

26.401 Scene context influences expectations about imprecisely specified search targets Arryn S Robbins, Michael C Hout

26.402 We remember what we looked for more precisely when search is difficult Jason Rajsic, Chong Zhao, Geoffrey F Woodman

26.403 The influence of search termination with correct "target absent" response Jieun Cho, Sang Chul Chong

26.404 The Influence of Training with One or Two Faces on Dual-Target Face Search Natalie Mestry, Silke Vos, Tamaryn Menneer, Nick Donnelly

26.405 How do differences across visual features combine to determine visual search efficiency in parallel search? Alejandro Lleras, Jing Xu, Simona Buetti

26.406 Factors that reduce grouping also decrease the collinear masking effect in visual search Li Jingling, Yen-Ting Liu

26.407 **Compound statistical learning of target selection and distractor suppression** Oscar Ferrante, Elisa Santandrea, Leonardo Chelazzi

26.408 Long-term learned values of visual objects guide involuntary gaze bias in no-goal condition Hyeji Z Kim, Joonyoung Kang, Sue-Hyun Lee, Hyoung F Kim

26.409 Study of Visual Search in 3D Space using Virtual Reality (VR) Tandra Ghose, Aman S Mathur, Rupak Majumdar

26.410 Characterizing Cue Specificity in Visual Search Performance Maria Nikiforova, Melchi Michel

26.411 Two targets, held in memory, can guide search; four targets cannot. Farahnaz A. Wick, Gabriel Kreiman, Jeremy M. Wolfe

26.412 Experience with noise does not prevent the formation of Contextual Cueing Anna Vaskevich, Roy Luria

26.413 Long time no see: enduring behavioral and neuronal changes in feature conjunction learning 3 years after training Sebastian M Frank, Mark W Greenlee, Peter U Tse

26.414 Implicit measurement of the own-race bias using the visual search paradigm Sandra C Utz, Sabrina Weigand, Claus-Christian Carbon

26.415 Hybrid Foraging Performance is Related to Fluid Intelligence Adrián R. Muñoz-García, Matthew S. Cain, Jeremy M. Wolfe, Beatriz Gil-Gómez de Liaño

### Motion: Higher order

Saturday, May 19, 2:45 - 6:45 pm, Pavilion

26.416 **How unconscious retinotopic processing influences conscious non-retinotopic perception** Oh-hyeon Choung, Marc M. Lauffs, Haluk Öğmen, Michael H. Herzog

26.417 **Temporal integration of speed change in motion percep-tion** Abigail RI Lee, Justin M Ales, Julie M Harris

26.418 Border enhancing flicker effect in form-from-motion test Sara Giovagnoli, Roberto Bolzani, Tony Pansell, Mariagrazia Benassi

26.419 Global motion perception is faster but less accurate with dark random-dot kinematograms Lanya Tianhao Cai, Benjamin T Backus

26.420 **Flicker-Induced Induced Motion** Gennady Erlikhman, Sion Gutentag, Christopher Blair, Gideon P Caplovitz

*26.421* **Motion Entrainment in the Periphery** Neal Dykmans, Stuart Anstis

26.422 Violation of projective consistency in structure-from-motion: a role for skin motion? Xiaoli He, Manish Singh, Jacob Feldman

26.423 Visual psychophysics on the web: open-access tools, experiments, and results using online platforms Sivananda Rajananda, Megan A.K. Peters, Hakwan Lau, Brian Odegaard

26.424 Moderate Influence of Target Size Variability on Visual Gravity Judgements Björn Jörges, Lena Slupinski, Joan López-Moliner

26.425 **Priming staircase motion: evidence of a motion-pattern priming mechanism** Nathan H Heller, Maxwell Schooley, Sean McDougall, Nicolas Davidenko

26.426 Stimulus driven attention-shift as a driver of apparent motion perception Zijiang He, Wei Wei, Chao Han, Teng Leng Ooi

26.427 **Path Shortening in Transformational Apparent Motion** Kevin C Hartstein, Patrick Cavanagh, Peter U Tse

26.428 Your Visual System (Probably) Knows More Physics than You Do Colin Conwell, George A Alvarez

26.429 Frames of Reference Determine the Direction of The Motion Aftereffect (MAE): Evidence supporting the influence of perceived motion in the MAE. Jason P Clarke, Maria Kuvaldina, Arien Mack

26.430 Motion not consciously visible can influence perception: Revisiting the Motion Bridging Effect. Maximilian Stein, Robert Fendrich, Uwe Mattler

### Attention: Features, objects, faces

Saturday, May 19, 2:45 - 6:45 pm, Pavilion

26.431 Feature-based attention is constrained to attended locations in older adults Frederik Geweke, Shu-Chen Li, Viola S Störmer

26.432 **Rhythmic sampling of orientation features in feature-based attention** Ce Mo, Bichan Wu, Huan Luo, Fang Fang

26.433 Surround Suppression in Feature-based Attention to Orientation James A Cesaro, Wanghaoming Fang, Taosheng Liu

26.434 Active Attentional Suppression Cannot Be Explained by Recoding to a Positive Template Nancy B Carlisle

26.435 **Templates for rejection occur only in early trials in intermixed search arrays** Tomoyuki Tanda, Jun Kawahara

26.436 **Examining the limits of feature integration** Greg H Huffman, Mathew D Hilchey, Jay Pratt

26.437 Attentional deployment to Space and Features: Separate and Together Guangsheng Liang, Miranda Scolari

26.439 Attentional spread during one-shot visual perception of multiple objects Alexey U. Yakovlev, Igor S. Utochkin

26.440 A CNN Model of "Objectness" Predicts Fixations During Free Viewing Yupei Chen, Gregory J. Zelinsky

26.441 Distinct neural sources of expectations about features and objects Peter Kok, Lindsay Rait, Nicholas B. Turk-Browne

26.442 **Automatic Encoding of Visual Numerosity** Nicholas K DeWind, Marty Woldorff, Elizabeth M Brannon

26.443 Ensemble information is built with a bag of free-floating visual features. Oakyoon Cha, Sang Chul Chong

26.444 Object-based attention is modulated by shift direction and visual field quadrant Adam J Barnas, Adam S Greenberg

26.445 **Object-based warping: Exploring links to attention** Kerri A. Walter, Gregory Wade, Timothy J. Vickery

26.446 **The Influence of Shape Curvature on Decision-Making Processes** Grace E Remboldt, Rebecca J Neal, Olivia R Krieger, Alexandra Theodorou, Jesse J Bengson

26.447 Visual Processing of Spatial Relations Within and Between Objects Christine E. Nothelfer, Steven Franconeri

26.448 Weak interactions between surface and shape featured-based forms of attention during object perception Nina Lee, Matthias Niemeier

26.449 Task-Irrelevant Semantic Relationships Between Objects and Scene Guide Visual Attention Joseph C Nah, Sarah Shomstein

26.450 Controling for Perceptual Differences in the Faces Flanker Task Regard M Booy, Thomas Spalek

26.451 **Task-Dependent Information Compression in Face, Object and Scene Categorization** Katarzyna Jaworska, Oliver GB Garrod, Nicola J van Rijsbergen, Arjen Alink, Ian Charest, Philippe G Schyns

# Temporal Processing: Timing, duration, latency

Saturday, May 19, 2:45 - 6:45 pm, Pavilion

26.452 **The perception and meta-perception of time within and between modalities** Simon J Cropper, Amy Kendrick, Patrick Goodbourn, Aurelio Bruno, Alan Johnston

26.453 The temporal profile of visual encoding. Martin Arguin

26.454 The nature of the impairment brought about by temporal crowding Yaffa Yeshurun, Shira Tkacz-Domb

26.455 Domain specific interactions between expectation and priming for sensory modality and timing Melisa Menceloglu, Marcia Grabowecky, Satoru Suzuki

26.456 **Double Dissociation in Radial & Rotational Motion-Defined Temporal Order Judgments** Leslie Welch, Nestor Matthews, Elena Festa, Kendra Schafer

26.457 Saccadic eye movement following a moving object results in a longer perceived duration compared with smooth pursuit Riko Iizuka, Yuko Yotsumoto

26.458 Uncertainty of the Internal Duration Template Dilates Subjective Time Yong-Jun Lin, Shinsuke Shimojo

26.459 The effects of figure-ground segmentation on non-linear visual evoked potentials Laila E Hugrass, David P Crewther

26.460 Saccadic and Movement Reaction Time discrimination in humans Valentina Vencato, Joan López-Moliner , Laurent Madelain

26.461 Beyond binning: Getting more out of the time course of one-sample-per-trial data Jonathan van Leeuwen, Jeroen B.J. Smeets, Artem V. Belopolsky

### Motion: Neural mechanisms and models

Saturday, May 19, 2:45 - 6:45 pm, Pavilion

26.462 **The dynamics of optic flow during natural locomo-tion** Jonathan Samir Matthis, Karl S Muller , Mary M Hayhoe

26.463 The effect of relative size on the interactions between motion sensors tuned to fine and coarse scale Sandra Arranz-Paraiso, Ignacio Serrano-Pedraza

26.464 **Motion perception in 360 degrees** Giyeul Bae, Steven Luck

26.465 **Motion perception and form discrimination in psychiatric patients.** Mariagrazia Benassi, Federica Ambrosini, Roberta Raggini, PatriziaRosa Sant'Angelo, Giovanni De Paoli, Sara Giovagnoli, Claudio Ravani, Giovanni Piraccini 26.466 **A model grounded in natural scene statistics predicts human performance with both natural and artificial stimuli** Benjamin M Chin, Johannes Burge

26.467 **The perceptual representation of "space" defined by motion versus color** Kara J Emery, Vicki J Volbrecht, David H Peterzell, Michael A Webster

26.468 Effect of 10Hz Transcranial Alternating Current Stimulation (tACS) on Motion Direction Identification Xizi Gong, Fang Fang

26.469 **Predictive coding of visual object position ahead of moving objects revealed by time-resolved EEG decoding** Hinze Hogendoorn, Anthony N Burkitt

26.470 Integration of position and predictive motion signals in older adults Hyun-Jun Jeon, Yeojeong Yun, Oh-Sang Kwon

26.471 Hyper-upregulation of abnormally low neural response along the visual pathway in autism tamar kolodny, Rachel Millin, Michael-Paul Schallmo, Alex M Kale, Raphael A Bernier, Scott O Murray

26.472 **Speed uncertainty and motion perception with naturalistic random textures** kiana mansour pour, Nikos Gekas, Laurent Perrinet, Pascal Mamassian, Anna Montagnini, Guillaume S. Masson

26.473 Search inefficiency in a directionally consistent target among directionally switching distractors Hoko Nakada, Ikuya Murakami

26.474 Stimulus predictability affects reconstruction of dynamic visual objects in early visual cortex Sunyoung Park, Won Mok Shim

26.475 **Exploring the Uncanny Valley** Flip Phillips, Filipp Schmidt, Laura Noejovich, George Chakalos

26.476 **The limits of apparent motion perception in the praying mantis** Jenny Read, Lisa Jones, Candy Rowe, Claire Rind, Vivek Nityananda, Ghaith Tarawneh

26.477 Aging and the estimation of visual motion direction Lindsey M Shain, J. Farley Norman

26.478 Short-latency ocular-following responses to motion stimuli are strongly affected by temporal modulations of the visual content during the initial fixation period. Boris Sheliga, Christian Quaia, Edmond J FitzGibbon, Bruce G Cumming

# Sunday Morning Talks

### Faces: Recognition and perception

Sunday, May 20, 8:15 - 9:45 am, Talk Room 1 Moderator: Alice O'Toole

31.11, 8:15 am A learned generative model of faces for experiments on human identity Jordan W Suchow, Joshua C Peterson, Thomas L Griffiths

31.12, 8:30 am Hierarchical Representations of Viewpoint and Illumination in Deep Convolutional Neural Networks Trained for Face Identification Matthew Q Hill, Connor J. Parde, Jun-Cheng Chen, Carlos D. Castillo, Volker Blanz, Alice J. O'Toole

*31.13, 8:45 am* **Disrupting features in faces: Configural representations or interaction with foveated vision?** Yuliy Tsank, Miguel P. Eckstein, Xiao (Nicole) Han

*31.14, 9:00 am* **A role for contrast gain control in face percep-tion** Richard Russell, Carlota Batres, Alex L. Jones, Aurélie Porcheron

*31.15, 9:15 am* **The speed of human face categorization** Talia L Retter, Fang Jiang, Bruno Rossion

31.16, 9:30 am Holistic Processing of Conscious and Unconscious Faces Haiyang Jin, Paul M. Corballis, Matt Oxner, William G. Hayward

### Visual Memory: Cognitive neuroscience

Sunday, May 20, 10:45 am - 12:30 pm, Talk Room 1

Moderator: Caitlin Mullin

32.11, 10:45 am Evidence for non-frontal control of sensory working memory Thomas B Christophel, Chang Yan, Lee Stopak, Stefan Hetzer, John-Dylan Haynes

32.12, 11:00 am Posterior alpha and frontal delta oscillations interactively support priority switches within visual working memory. Ingmar EJ de Vries, Joram van Driel, Christian NL Olivers

32.13, 11:15 am Decoding the limits of simultaneous storage in working memory Kirsten Adam, Edward K. Vogel, Edward Awh

32.14, 11:30 am Drift in fMRI pattern representations during the delay interval predicts performance in a visual working memory task Phui Cheng Lim, Emily J Ward, Timothy J Vickery, Matthew R Johnson

32.15, 11:45 am The Genesis of Visual Memory through Strong Perceptual Representations: Tracking the Spatio-Temporal Neural Trace of Memorability Caitlin R Mullin, Yalda Mohsenzadeh , Dimitrios Pantazis , Aude Oliva

32.16, 12:00 pm Simultaneous representation of mnemonic and sensory information in human visual cortex Rosanne L Rade-maker, Chaipat Chunharas, John T Serences

32.17, 12:15 pm Decoding item-specific information in visual short-term memory from the hippocampal DG/CA3 subfield using high-resolution fMRI Weizhen Xie, Marcus Cappiello, Michael Yassa, Edward Ester, Gopikrishna Deshpande, Weiwei Zhang



### Color and Light: Lower level

Sunday, May 20, 8:15 - 9:45 am, Talk Room 2

Moderator: Rhea Eskew

31.21, 8:15 am Accommodation, chromatic aberration and chromatic stimuli Abigail P Finch, Maydel Fernandez Alonso, Jenny C A Read, Gordon D Love

31.22, 8:30 am Ray-tracing 3D Spectral Scenes Through Human Optics Trisha Lian, Kevin J MacKenzie, Brian Wandell

31.23, 8:45 am Color contrast gain in anomalous trichromats John E Vanston, Katherine EM Tregillus, Michael A Webster, Michael A Crognale

*31.24, 9:00 am* **Illusory colors from harmonic combinations: an unexpected consequence of ON and OFF pathways** Andrew T Rider, Bruce Henning, Rhea T Eskew Jr., Andrew Stockman

31.25, 9:15 am fMRI adaptation reveals interactions between responses to achromatic and S-cone isolating stimuli across visual cortex Erin Goddard, Robert F Hess, Kathy T Mullen

*31.26, 9:30 am* Luminance response functions in the human visual cortex Louis N Vinke, Sam Ling

### Eye Movements: Performance

Sunday, May 20, 10:45 am - 12:30 pm, Talk Room 2 Moderator: Miriam Spering

32.21, 10:45 am Extending DeepGaze II: Scanpath prediction from deep features Matthias Kümmerer, Thomas S.A. Wallis, Matthias Bethge

32.22, 11:00 am The impact of retinal image motion on extrafoveal sensitivity Janis Intoy, Norick R Bowers, Jonathan D Victor, Martina Poletti, Michele Rucci

32.23, 11:15 am Signatures of a probabilistic strategy in the control of saccadic eye movements Matteo Lisi, Joshua A Solomon, Michael J Morgan

32.24, 11:30 am **Preserving the global effect across a saccade** Kiki Arkesteijn, Jeroen B.J. Smeets, Mieke Donk, Artem V. Belopolsky

32.25, 11:45 am Presaccadic attention reshapes the sensory representation even when it impairs performance Hsin-Hung Li, Jasmine Pan, Marisa Carrasco

32.26, 12:00 pm **Classification and Statistics of Gaze In World Events** Rakshit S Kothari, Zhizhuo Yang, Kamran Binaee, Reynold Bailey, Christopher Kanan, Jeff Pelz, Gabriel Diaz

32.27, 12:15 pm Pursuing an imaginary foveal stimulus increases catch-up saccades Stephen Heinen, Jeremy B Badler, Scott NJ Watamaniuk



## Scene Perception: Objects, search, complexity

Sunday, May 20, 8:30 am - 12:30 pm, Banyan Breezeway

33.301 How difficult is it to identify a watermelon in a basketball court? Explaining the difficulty to identify incongruent objects Liad Mudrik, Alyssa Truman, Ran Amram

33.302 Salience-based object prioritization during natural-scene viewing in elderly and young adults Immo Schuetz, Wolfgang Einhäuser, Antje Nuthmann

33.303 Contextual effects of coarse global scene properties on object processing Tim Lauer, Verena Willenbockel, Julia I. Kunz, Melissa L.-H. Võ

33.304 Automaticity of scene understanding may not extend to highly associated actions or objects Sara Spotorno, Philippe G. Schyns

33.305 Anchoring spatial predictions in real-world scenes: Hierarchical relationships of objects predict single trial search performance Melissa L.-H. Võ, Sage EP Boettcher, Dejan Draschkow

33.306 Was that a moose on the road? Gist-like perception of emerging driving hazards Benjamin A Wolfe, Ruth Rosenholtz

33.307 Across the planes: Differing impacts of foreground and background information on visual search in scenes Louisa LY Man, Monica S Castelhano

33.308 Perceived Complexity and Aesthetic Responses to Landscape Photographs Whitney M Tate, Richard P Taylor, Margaret E Sereno, Alexander J Bies

33.309 A factor analytic approach reveals variability and consistency in perceived complexity ratings of landscape photographs Alexander J Bies, Whitney Tate, Richard P Taylor, Margaret E Sereno

33.310 Picture Perception Reveals Rules of 3D Scene Inference Erin M Koch, Famya Baig, Qasim Zaidi

### **Object Recognition: Categories**

Sunday, May 20, 8:30 am - 12:30 pm, Banyan Breezeway

33.311 Bottom-up processing of intermediate visual features is sufficient for animate/inanimate object categorization. Amanda C. Del Giacco, Valentinos Zachariou, Leslie G. Ungerleider, Xiaomin Yue

33.312 Prefrontal and category-selective ventro-temporal regions exhibit differential interactions between stimulus visibility and task Lior Bugatus, Kalanit Grill-Spector

33.313 Changes in Visual Scanning Strategies Accompany the Acquisition of Perceptual Expertise Allison N Carr, Andrea Cataldo, Hillary Hadley, Erik Arnold, James Tanaka, Tim Curran, Lisa S Scott

33.315 Gist Perception and Holistic Processing in Rapidly Presented Mammograms. Michael D Chin, Karla K Evans, Jeremy M Wolfe, Jim W Tanaka

33.316 A large-scale object database based on representative sampling of the English language Adam H Dickter, Martin N Hebart, Alexis M Kidder, Wan Y Kwok, Chris I Baker

33.317 Human Object Detection in Natural Scenes: Evidence From a New Dot Probe Task Colin S Flowers, Mary A Peterson

# Sunday Morning Posters

33.318 Examining within-category discrimination of faces and objects of expertise. Simen Hagen, James W. Tanaka

33.319 The effect of task on categorization behavior and its relationship to brain and deep neural networks Martin N Hebart, Charles Y Zheng, Chris I Baker

33.320 Categorical Targets Can Be Identified without Localization Shekoofeh Hedayati, Brad Wyble

33.321 Automatic categorical abstraction during visual statistical learning in children and adults Yaelan Jung, Dirk B. Walther, Amy S. Finn

33.322 Drawings as a window into the development of object category representations Bria L. Long, Judith Fan, Michael C. Frank

33.323 Using frequency tagging to study the effect of category learning on visual attention to object parts Yue Meng, Jonathan R Folstein

33.324 Spatiotemporal dynamics of categorical representations in the human brain and deep convolutional neural networks Yalda Mohsenzadeh, Caitlin Mullin, Bolei Zhou, Dimitrios Pantazis, Aude Oliva

33.325 Depth sensitivity of category-selective visual areas to preferred and non-preferred stimuli Samoni Nag, Daniel Berman, Julie D Golomb

33.326 **Awareness of category rule learning** Pooja Patel, Audrey Hill Zlatkin, Andrew Wismer, Corey Bohil

33.327 **Sampling from object and scene representations using deep feature spaces** Joshua C Peterson, Krishan Aghi, Jordan W Suchow, Alexander Ku, Thomas L Griffiths

33.328 **Towards using human-surrogate models to optimize training sequences during visual category learning** Brett D Roads, Michael C Mozer

33.329 The effect of familiarity and novelty on preference of paintings modulated by complexity and categories Jiwon Song, Yuna Kwak, Chai-Youn Kim

### **Object Recognition: Features, parts, models**

Sunday, May 20, 8:30 am - 12:30 pm, Banyan Breezeway

33.330 Preferential use of local visual information in individuals with many autistic traits Arjen Alink, Ian Charest

33.337 Minimal Recognizable Configurations (MIRCs) elicit category selective responses in high order visual cortex Galia Avidan, Yael Holzinger, Shimon Ullman, Marlene Behrmann

33.332 **The Fusiform Body Area Represents Spatial Relationships Between Pairs of Body Parts** Alexander Bratch, Stephen A Engel, Philip C Burton, Daniel J Kersten

33.333 Axes of Real-World Objects: Evidence from Orientation Reflection Errors Thitaporn Chaisilprungraung, Michael McCloskey

33.334 Implicit visual recollection: Connecting the dots without top-down knowledge Rosemary A Cowell, Patrick S Sadil, Kevin W Potter, David E Huber

33.335 **Rod-mediated contour integration measured under scotopic conditions using radial frequency patterns** Oliver J Flynn, Brett G Jeffrey

33.336 Convergent evidence for global processing of shape Robert J Green, Edwin Dickinson, David R Badcock

33.337 **Real-time Optimization for Visual Feature Identification** Jayanth Koushik, Austin Marcus, Aarti Singh, Michael J Tarr

33.338 Large-scale identification of the visual features used for object recognition with ClickMe.ai Drew Linsley, Dan Shiebler, Sven Eberhardt, Andreas Karagounis, Thomas Serre

33.339 **The underlying mechanism for detecting straight lines.** Marie Morita, Takao Sato

33.340 Symmetry produces distinctive, not greater BOLD activation in object-selective cortex RT Pramod, SP Arun

33.341 Infants distinguish light from pigment using temporal, not motion, cues when forming object representations Rebecca J Woods, Savanna Jellison, Shea M. Lammers

33.342 Bayesian shape similarity based on 3D shape skeletons Nathan R J Destler, Manish Singh, Jacob Feldman

33.343 Tuning of a Deep Neural Network to object and surroundings colors for object recognition. Alban C Flachot, Karl R Gegenfurtner

33.344 Nonlinear visual mechanisms for 2D shape discrimination with pose uncertainty Ingo Fruend, John D Wilder, James H Elder

33.345 **Convolutional neural networks represent shape dimensions—but not as accurately as humans** Mark D Lescroart, David F Fouhey, Jitendra Malik

33.346 **Predicting object shape and curvature judgments with a new parameterization of shape** Caterina Magri, Andrew Marantan, L. Mahadevan, Talia Konkle

33.347 A brain-mediated computational model to estimate perceptual experiences evoked by arbitrary naturalistic visual scenes Satoshi Nishida, Shinji Nishimoto

33.348 **Understanding visual recognition via self-supervised deep neural networks** Kandan Ramakrishnan, Bolei Zhou, David Bau, Antonio Torralba, Aude Oliva

### Perception and Action: Neural mechanisms

Sunday, May 20, 8:30 am - 12:30 pm, Banyan Breezeway

33.349 Lateralized modulation of self-generated visual stimuli Batel Buaron, Daniel Reznik, Roee Gilron, Roy Mukamel

33.350 Interaction of visual and semantic features in actionbased prediction Emily Avery, Nicholas C Hindy, Nicholas B Turk-Browne

33.351 Decoding identity and action properties of tools for viewing and pantomiming Stephanie Rossit, Diana Tonin, Fraser W. Smith

33.352 Encoding of reaching and grasping intentions from monkey medial parietal cortex Patrizia Fattori, Elisa Santandrea, Rossella Breveglieri, Annalisa Bosco, Claudio Galletti

33.353 **Predicting the Behavioral Similarity Structure of Visual Actions** Leyla Tarhan, Talia Konkle

33.354 Mirror neuron system activation differs in experienced golfers compared to controls watching videos of golf compared to novel sports depending on conceptual versus motor familiarity. Georgina A Amos, Philippe A Chouinard

33.355 Neural model for the recognition of agency and interaction from motion Mohammad Hovaidi Adestani, Nitin Saini, Martin Giese

33.356 Flexibility of categorical body representation following limb-loss and prosthesis usage in the occipitotemporal cortex Roni O Maimon-Mor, Heidi Johansen-Berg, Jody C Culham, Tamar R Makin 33.357 **Psychophysiology of Visual-Motor Learning during a Simulated Marksmanship Task in Immersive Virtual Reality** Lawrence Appelbaum, Jillian Clements, Elayna Kirsch, Hrishikesh Rao, Nicholas Potter, Regis Kopper, Marc Sommer

33.358 Using EEG to compare brain responses to graspable real-world objects versus 2D images Francesco Marini, Katherine A Breeding, Jacqueline C Snow

33.360 Mechanisms of Neuromodulation by Transcranial Current Stimulation Yinghua Liu, Kohitij Kar, Jacob Duijnhouwer, Pierre-Olivier Polack, Bart Krekelberg

33.367 **Touchpoints reveal sensitivity to object shape in an individual with visual agnosia and in another who is cortically blind** Robert L Whitwell, Melvyn A Goodale, James T Enns

33.362 Decoding auditory motion direction and location in hMT+/V5 and Planum Temporale of sighted and blind individuals Ceren Battal, Mohamed Rezk, Stefania Mattioni, Roberto Bottini, Giorgia Bertonati, Valeria Occelli, Stefano Targher, Olivier Collignon

33.363 **The role of alpha-band frequency activity during performance of a visual-motoric interhemispheric transfer task.** Stephanie L Simon-Dack, Brian Kraus, Zachary Walter, Chelsea Cadle, Shelby Smith

33.364 **The Emergent Encoding of Human Interactions in the Brain** Jon Walbrin, Kami Koldewyn

33.365 fMRI response patterns in human somato-motor cortex predict memory advantage for real objects versus their images Sara Fabbri, Michael T. Compton, Edward B. O'Neil, Lars Strother, Jacqueline C. Snow

33.366 **EEG decoding reveals functionally independent neural signatures for perceptual maintenance and confidence-based maintenance during conscious perception** Matthew Weaver, Johannes J Fahrenfort, Artem V Belopolsky, Simon van Gaal

# Perceptual Organization: Grouping and segmentation

Sunday, May 20, 8:30 am - 12:30 pm, Banyan Breezeway

33.367 Modeling perceptual grouping in peripheral vision for information visualization Shaiyan O Keshvari, Dian Yu, Ruth Rosenholtz

33.368 **Perceptual Grouping of Dichoptic Plaids** Emily Slezak, Andrew J Coia, Steven K Shevell

33.369 The perceptual capacity of concurrent grouping of colored dots by similarity and by dissimilarity Peng Sun, Chales Chubb, Charles Wright, George Sperling

33.370 **Contrast dependency of Gestalt proximity principle** Lee Lin, Chien-Chung Chen

33.371 Is configural superiority associated with a cost in processing spatial information? Pieter Moors, Thiago Leiros Costa, Johan Wagemans

33.372 Testing Levelt's laws for interocular grouping using contrast- and luminance-modulated stimuli Jan Skerswetat, Monika A. Formankiewicz, Sarah J. Waugh

33.373 The role of perceptual and contextual information in social event segmentation Nida Latif, Francesca Capozzi, Jelena Ristic

33.374 Bound Together: Social binding leads to faster processing, spatial distortion and enhanced memory of interacting partners. Tim Vestner, Steven P Tipper, Tom Hartley, Harriet Over, Shirley-Ann Rueschemeyer 33.375 Spatial Representations of the Visual World are not Coordinate Reference Systems Pedro Sztybel, Bradley S Gibson, Michael J Wenger

### Attention: Capture

Sunday, May 20, 8:30 am - 12:30 pm, Pavilion

33.401 **Revisiting Attention Capture by Motion Onset** Kendra C Smith, Richard A Abrams

33.402 Investigating the role of the Frontal Eye Field (FEF) and of the Intraparietal Sulcus (IPS) in attentional capture: A TMS study Carlotta Lega, Oscar Ferrante, Elisa Santandrea, Luigi Cattaneo, Leonardo Chelazzi

33.403 10Hz Transcranial Alternating Current Stimulation (tACS) Transiently Reduces Visual Distraction Yao Li, Fang Fang

33.404 Tracking frontal involvement in the control of attention with EEG: frontal signal related to both termination and prevention of attention misallocations Heinrich R. Liesefeld, Anna M. Liesefeld, Hermann J. Müller

33.405 A potential benefit of eye blinks? Performance in RSVP tasks after blinks (and blanks) Jit Wei (Aaron) Ang, Gerrit Maus

33.406 The role of probabilistic expectations on the suppression of salient distractor Bo-Yeong Won, Joy J Geng

33.407 Capturing the response dynamics of attention capture with mouse tracking Michael Dieciuc, Walter R Boot

33.408 No suppression of stimulus-driven capture with distractor and target singletons of the same (color) dimension Hanna Weichselbaum, Ulrich Ansorge

33.409Attentional capture within and between depthplanesThorsten Plewan, Gerhard Rinkenauer

33.410 Attentional capture by contextual cues can cause inverse cueing effects (same location costs) Josef G. Schönhammer, Stefanie I. Becker, Dirk Kerzel

33.411 Errors without doubt: Stimulus-driven attentional capture leads to feature-binding errors but no loss in confidence Jiageng Chen, Julie D Golomb

33.412 Peripheral Cueing of Attention: No Selective Attention Capture by Top-Down Matching Singleton Cues in the Presence of Top-down Matching Non-Singletons Tobias Schoeberl, Florian Goller, Ulrich Ansorge

33.413 Altering oculomotor capture by manipulating expectation breadth for a singleton color Daniel Ernst, Gernot Horstmann

33.414 Do Top-Down Search Templates for Color Depend on Language? Diane Baier, Ulrich Ansorge

33.415 Search efficiency is not enough; the nature of search task modulates attentional capture by a salient distractor in inefficient visual search Koeun Jung, Suk Won Han, Yoonki Min

33.416 Set size matters when capturing attention in a hybrid visual-memory search Katherine S Moore, Jaimie Jasina, Ariel Kershner, Aziza Ransome

33.417 Saliency capture, contingent capture and onset capture in visual search and spatial cueing Stefanie I. Becker, Courtney Judd

33.418 Suppression of Attention Capture: The Role of Selection History Nicholas Gaspelin, John M Gaspar, Steven J Luck

33.419 Working memory prioritization impacts the dynamics of attentional capture Remington Mallett, Jarrod A. Lewis-Peacock

33.420 Attentional capture by redundant visual information Jiyeong Ha, Hee-kyung Park, Yoonjung Lee, Do-Joon Yi 33.421 **The Attentional "White Bear" Evades Visual Working Memory** Ryan S Williams, Robert Newman, Jay Pratt, Susanne Ferber

33.422 The Power of Negative Thinking: Paradoxical but Effective Ignoring of Salient-but-Irrelevant Stimuli by a Spatial Cue Seah Chang, Corbin A. Cunningham, Howard E. Egeth

33.423 Whereof one cannot speak: How language and capture of visual attention interact Florian Goller, Soonja Choi, Ulrich Ansorge

33.424 **Reaching behavior reveals outsized impact of distractor salience and selection history in young children** Jeff Moher, Christopher D Erb, Stuart Marcovitch

### Attention: Resources divided and suppressed

Sunday, May 20, 8:30 am - 12:30 pm, Pavilion

33.425 **ERP measures of target and distractor processing are affected by attentional prioritization** Christine Salahub, Blaire Dube, Naseem Al-Aidroos, Stephen M. Emrich

33.426 A Binding Illusion of Ambiguous Color Location Between Two Locations Cristina R Ceja, Steven L Franconeri

33.427 Perceptual as well as conceptual similarity factors drive competitive relations among irrelevant visual distractors Nurit Gronau, Hanna Benoni, Anna Izoutcheev

33.428 **Suppression history of spatial locations biases attentional and oculomotor control** Valeria Di Caro, Jan Theeuwes, Chiara Della Libera

33.429 Fatigue causes lengthened giving-up times when the task is hard Gemma L Hanson, Dominic Taunton, Tamaryn Menneer, Nicholas Donnelly

33.430 Evaluation of visual sensitivity across the visual field under varying levels of cognitive load Simona Buetti, Sophie I Leib

33.431 Reconceptualizing perceptual load as a rate problem: The role of time in the allocation of selective attention Zhi Li, Keyun Xin, Wei Li, Yanzhe Li

33.432 **Competition for attentional selection between reward and loss value associations** Jaclyn Dell, Melissa Cloutier, Heather Crews, Brianna Suite, Andrea Veramendi, Jennifer L. O'Brien

33.433 Scarcity biases attention to motivationally relevant distractors Brandon M Tomm, Jiaying Zhao

33.434 Social presence and multimodal presentation of attentional cues: possible moderators of the Stroop effect Anika L Gearhart, Basil Wahn, Scott Sinnett

33.435 Walk the line: Pedestrian distraction and cross walk safety Bonnie Angelone, Megan Brown, Emily Diana

33.436 Effects of simulated vision impairment and auditory distraction on the detection of hazards while driving Ting Zhang, Steven W Savage, Alex R Bowers

33.437 Musical expertise modulates the cost of crossmodal divided attention between vision and audition in behavior but not in tonic pupil dilation Hiu Mei Chow, Vivian Ciaramitaro

33.438 Attentional Effort and Efficiency in Expert Dancers Anna Riley-Shepard, George A Alvarez

### 3D Perception: Depth and cue combination

Sunday, May 20, 8:30 am - 12:30 pm, Pavilion

33.439 Texture compression and scaling both contribute to perception of 3D slant from texture Jeffrey A Saunders, Zhongting Chen

Sunday AM

33.440 Perceptual integration of perspective and stereoscopic cues in macaque monkeys Ting-Yu Chang, Byounghoon Kim, Adhira Sunkara, Ari Rosenberg

33.441 Shape constancy in anaglyphs: Effects of drawing training Kelly Edwards, Alexander J. Bies, Atsushi Kikumoto, Stefanos Lazarides, Margaret E. Sereno

33.442 Microparallax is preferred over blur as a cue to depth order at occlusion boundaries Dmitrii Tiron, Michael Langer

33.443 An object's material properties provide motion cues to three-dimensional shape Masakazu Ohara, Juno Kim, Kowa Koida

33.444 **Tight shadows shrink depth** Patrick Cavanagh, Roberto Casati, James H Elder

33.445 The influence of a shadow cognitively casted on surfaces on the depth perception in the stereopsis Ouri Fujiya, Tatsuya Yoshizawa, Tsutomu Kusano, Shinya Saida

33.446 Reflections on Depth from Reflections: Discounting Surfaces Michael A Crognale

33.447 Face superiority - Cartoon 3-D faces produce a stronger depth-inversion illusion than geometric objects that share the same basic bounding contour. Attila Farkas, Thomas V Papathomas, Steven M Silverstein, Tome Grace

33.448 The role of binocular disparity in depth-inversion illusions studied with synopters and pseudoscopes Thomas V Papathomas, Nicola Bruno, Attila Farkas

33.449 **The combination of 3D motion cues in Virtual Reality** Mohan Ji, Jacqueline M Fulvio, Bas Rokers

33.450 **Perception of Object Movement in Virtual Reality** Rowan T Hughes, Peter Scarfe, Paul B Hibbard, Loes C J van Dam

33.451 Driving accommodation using simulated higher-order aberrations Steven A Cholewiak, Gordon D Love, Martin S Banks

### **3D Perception: Space**

Sunday, May 20, 8:30 am - 12:30 pm, Pavilion

33.452 Explicit estimates of angular direction are more expanded in elevation than in azimuth, even with sideways observers Umi I Keezing, Frank H Durgin

33.453 Distinguish egocentric distance perception from traveled distance perception. Thomas Rousset, Christophre Bourdin, Jean-Louis Vercher

33.454 **Detecting 3D location change in the presence of grouping cues** Ellis L Gootjes-Dreesbach, Peter Scarfe, Andrew Glennerster

33.455 Searching for Invariance: Geographical and Optical Slant Olivia C Cherry, Geoffrey P Bingham

33.456 Pathing judgment on planes and spheres: Accurate intuitions about shortest paths Matthew Jordan, Yuval Hart, Moira R Dillon

33.457 Gravity and ground plane geometry in perspective images. Elodie Fourquet, Flip Phillips

*33.458* Distance perception in the VR was determined by where you virtually are and where you really are Junjun Zhang, Xiaoyan Yang

33.459 **Depth constancy for virtual and physical objects** Brittney A Hartle, Matthew D Cutone, Laurie M Wilcox

33.460 **The effects of environmental context upon distance bisection** Catherine J Dowell, J. Farley Norman, Alexia J. Higginbotham, Nicholas W. Fedorka, Hideko F. Norman

33.461 Virtual Reality study of the influence of environment color and luminosity in depth perception Ruggero Micheletto, Tomoharu Nagahama

33.462 **Percept- driven versus data-driven pupil's response: effects of illusory depth.** Michael Wagner, Ronen Hershman, Avishai Henik

33.463 **Perceptually optimized view density for continuous par-allax** Christos Kaspiris-Rousellis, Adam Simmons, Jenny C. A. Read

33.464 Using Visual Snapshots to Estimate Egocentric Orientation in Natural Environments Max T Kinateder, Emily A Cooper

33.465 Facial orientation biases in visual vs. pictorial space Niko Troje, Dean H. Rosen, Siavash Eftekharifar

33.466 Shape and Size Constancy in Consumer Virtual Reality Rebecca L Hornsey, Paul B Hibbard

#### Visual Search: Models and mechanisms

Sunday, May 20, 8:30 am - 12:30 pm, Pavilion

33.467 Incidental Learning of Context-Feature Associations Impacts Attentional Set Sunghyun Kim, Melissa R Beck

33.468 Large field and high resolution: detecting needle in a haystack Hadar Gorodissky, Daniel Harari, Shimon Ullman

33.469 **Training a Convolutional Neural Network to Detect the Gist of Breast Cancer** Gaeun Kim, Arkadiusz Sitek, Jian Chen, Karla K Evans, Jeremy M Wolfe

33.470 The high prevalence effect meets the low prevalence effect Todd Horowitz

33.471 The unique face-centered human strategy to search for people in the wild Miguel P Eckstein, Thuyen V Ngo, B.S. Manjunath

33.472 Does this grab your attention? A comparison of attention and memory resources deployed during search for artificial and real world objects. Christopher M Jones, Lauren H Williams, Trafton Drew

33.473 Effects of Saccade Magnitude, Spatial Frequency, and Ocular Artifact Removal on the Fixation-related Lambda Response Anthony J Ries, David Slayback, Jon Touryan

33.474 Fixation Selection for Categorical Target Searches in Real-World Scenes Nicholas Kleene, Melchi Michel

33.475 Display repetitions do not improve search efficiency in parallel search tasks. Gavin JP Ng, Simona Buetti, Alejandro Lleras

33.476 Is there a relationship between object recognition ability and visual search efficiency? Jing Xu, Alejandro Lleras, Simona Buetti

33.478 Are rejected distractors maintained in working memory? Evidence from the Contralateral Delay Activity Lauren H Williams, Trafton Drew



# Attention: Models, methods and multiple targets

Sunday, May 20, 2:30 - 4:15 pm, Talk Room 1 Moderator: Iris Wiegand

*34.11, 2:30 pm* **Modeling the neural underpinnings of attentional suppression as constrained by EEG and behavioral data** Chloe Callahan-Flintoft, Brad Wyble

34.12, 2:45 pm In pursuit of visual attention: SSVEP frequency-tagging targets in a smooth-pursuit paradigm Peter de Lissa, Roberto Caldara, Victoria Nicholls, Sebastien Miellet

*34.13, 3:00 pm* **Probabilistic perceptual landscapes** Andrey Chetverikov, Gianluca Campana, Árni Kristjánsson

34.14, 3:15 pm Subjective inflation in the unattended periphery in a naturalistic environment Brian A Odegaard, Musen Li, Hakwan Lau

34.15, 3:30 pm Hybrid visual and memory search is preserved in older age Iris Wiegand, Jeremy M Wolfe

34.16, 3:45 pm Single-target visual search tasks provide only a snap-shot of attentional orienting: New insights from visual foraging tasks. Arni Kristjansson, Ian M Thornton, Tómas Kristjansson

34.17, 4:00 pm Modelling complex perception-action choices Ruohan Zhang, Jake A Whritner, Zhuode Liu, Luxin Zhang, Karl S Muller, Mary M Hayhoe, Dana H Ballard

# Sunday Afternoon Talks

### **Binocular Vision: Neural mechanisms**

Sunday, May 20, 2:30 - 4:15 pm, Talk Room 2 Moderator: Frederick Kingdom

34.21, 2:30 pm Interocular normalization in monkey primary visual cortex Alexandre Reynaud, Sébastien Roux, Sandrine Chemla, Frédéric Chavane, Robert F Hess

34.22, 2:45 pm Cocktails anyone? Revisiting ocular dominance and opponent cortical processing Daniel Y Tso, Ronald Miller, Momotaz Begum

34.23, 3:00 pm A hierarchical Bayesian model for inferring neural tuning functions from voxel tuning functions Patrick Sadil, David E. Huber, John T. Serences, Rosemary A. Cowell

34.24, 3:15 pm Levelt's propositions examined at the level of mutually inhibiting pyramidal cells in primary visual cortex Naoki Kogo, Felix Kern, Thomas Nowotny, Raymond van Ee, Richard van Wezel, Takeshi Aihara

34.25, 3:30 pm Adaptation to interocular decorrelation Frederick Kingdom, Ben J Jennings, Mark A Georgeson

34.26, 3:45 pm Visual dominance for darks increases in amblyopia. Carmen Pons, Reece Mazade, Jianzhong Jin, Mitchell Dul, Qasim Zaidi, Jose-Manuel Alonso

34.27, 4:00 pm Stereo perimetry reveals a foveal impairment of stereopsis in amblyopia. Saeideh Ghahghaei, Preeti Verghese

### **Development and Disorders**

Sunday, May 20, 5:15 - 7:15 pm, Talk Room 1 Moderator: Catherine Manning

35.11, 5:15 pm Coherent motion evoked responses in school-aged children Catherine Manning, Gaia Scerif, Anthony M Norcia

35.12, 5:30 pm Gray Matter Thinning in Ventral Temporal Cortex from Childhood to Adulthood is Associated with Increased Myelination Vaidehi S Natu, Jesse Gomez, Michael Barnett, Brianna Jeska, Zonglei Zhen, Evgeniya Kirilina, Carsten Jaeger, Siobhan Cox, Kevin S Weiner, Nikolaus Weiskopf, Kalanit Grill-Spector

35.13, 5:45 pm Fiber-tract differences in people with congenital and acquired blindness Katherine E.M. Tregillus, Lora T Likova

35.14, 6:00 pm Motion cues aids perception of implied motion in amblyopia Mahesh Raj Joshi, Anita J Simmers, Seong Taek Jeon

35.15, 6:15 pm Abnormal visual crowding and developmental dyslexia: Cause or effect? Simone Gori, Sara Bertoni, Sandro Franceschini, Luca Ronconi, Andrea Facoetti

35.16, 6:30 pm Global motion and form processing and attention deficits in multiple child cohorts with neurodevelopmental disorders: Dorsal vulnerability or dorsal/ventral integration? Janette Atkinson, Fleur Corbett, Elisa Fazzi, Serena Micheletti, Jessica Galli, Paola Mattei, Daniela Ricci, Giorgia Coratti, Maria Mallardi, Morag Andrew, Peter Sullivan, Jeremy Parr, Christine Montague-Johnson, Oliver Braddick

35.17, 6:45 pm Atypical visual motion prediction in autism spectrum disorder Woon Ju Park, Kimberly B Schauder, Oh-Sang Kwon, Loisa Bennetto, Duje Tadin

35.18, 7:00 pm Weaker neural suppression in autism spectrum disorder Michael-Paul Schallmo, Alex M Kale, Tamar Kolodny, Rachel Millin, Raphael A Bernier, Scott O Murray

### **Object Recognition: Categories**

Sunday, May 20, 5:15 - 7:15 pm, Talk Room 2 Moderator: Wilson Geisler

35.21, 5:15 pm **Understanding camouflage detection** Abhranil Das, Wilson S Geisler

35.22, 5:30 pm Interdigitation of words and faces in the ventral visual stream: reevaluating the spatial organization of category selective cortex using intracranial EEG Matthew J Boring, Edward H Silson, Yuanning Li, Michael J Ward, Chris I Baker, Mark R Richardson, Avniel S Ghuman

35.23, 5:45 pm A preference for mathematical tasks outweighs the selectivity for Arabic numbers in the inferior temporal gyrus Mareike Grotheer, Brianna Lynn Jeska, Kalanit Grill-Spector

35.24, 6:00 pm The ventral visual pathway represents animal appearance rather than animacy, unlike human behavior and deep neural networks Stefania Bracci, Ioannis Kalfas, Hans Op de Beeck

35.25, 6:15 pm Endogenous oscillatory activity modulates category tuning in ventral temporal cortex Yuanning Li, Michael J Ward, Mark Richardson, Max G G'Sell, Avniel S Ghuman

35.26, 6:30 pm The balanced act of crossmodal and intramodal plasticity: Enhanced representation of auditory categories in the occipital cortex of early blind people links to reduced temporal coding Stefania Mattioni, Mohamed Rezk, Ceren Battal, Jyothirmayi Vadlamudi, Olivier Collignon

35.27, 6:45 pm Curved features are critical for animate/inanimate categorization in macaques Marissa A Yetter, Mark Eldridge, Grace Mammarella, Leslie G Ungerleider, Xiaomin Yue

35.28, 7:00 pm **One shot learning of novel object classes** Yaniv Morgenstern, Filipp Schmidt, Roland W Fleming



### Faces: Learning, development, aging

Sunday, May 20, 2:45 - 6:45 pm, Banyan Breezeway

36.301 Building a representation of newly encountered faces: A role for context? Kristen A Baker, Catherine J Mondloch

36.302 The effect of practice with inverted faces on behavioural and ERP horizontal bias. Ali Hashemi, Matthew V Pachai, Patrick J Bennett, Allison B Sekuler

36.303 Does categorization training change the encoding of face identity? Fabian A Soto

36.304 Effectiveness of a Facial Forensic Training Course P Jonathon Phillips, Rebecca Heyer, Dana Michalski

36.305 Does face-drawing experience enhance face processing abilities? Evidence from hidden Markov modeling of eye movements Janet H. Hsiao, Hui Fei Chan, Tze Kwan Li, Antoni B. Chan

36.306 Greeble Training in Adolescents Increases Neural Activation in the FFA Giorgia Picci, Marlene Behrmann, Suzanne Scherf

36.307 **Neural sensitivity to face animacy in childhood** Benjamin Balas, Laurie Bayet, Alyson Saville

36.308 Categorization of face race and sex in preschool-aged children by means of fast periodic visual stimulation. Ryan A Barry-Anwar, Stefania Conte, Lisa S Scott

36.309 Seeing morphing faces of own- and other-race: the development of face discrimination in 3- to 7-year-old Taiwanese children Sarina Hui-Lin Chien, Shu-Fei Yang, En-Yun Hsiung, Chun-Man Chen

36.310 **Recognition of approaching walkers in infancy** Megumi Kobayashi, So Kanazawa, Masami K Yamaguchi, Alice J O'Toole

36.371 **The development of emotion perception strategies in children.** Victoria Foglia, Haichao Zhang , Jennifer A. Walsh, M.D. Rutherford

36.312 Impact of Expressive Intensity on Age Differences in Fear and Anger Detection in the Periphery Andrew Mienaltowski, Brittany Groh, Dixi Secula, Allison Rinne, Connor Rogers

36.313 Age Differences in Emotional Enhancement of Visually-Evoked Early Posterior Negativity during Peripheral Emotion Detection Shelby A King, Dixi S Secula , Allison Rinne, Alyssa Minton, Ashley Gilliam, Andrew Mienaltowski

36.374 Processing speed and fluid intelligence contribute towards decline in facial emotion recognition ability across the adult lifespan Jennifer J Murphy, Hayley Geary, Edward Millgate, Caroline Catmur, Geoff Bird

36.315 **The Eyes Have It: Age Differences in Emotion Detection for Open and Closed Mouth Expressions** Allison M Rinne, Dixi Secula, Shelby King, Alyssa Minton, Miriam Chinkers, Hannah Heisler, Greta Glide, Andrew Mienaltowski

36.316 **The effects of aging in neural processing of facial threat cues via magnocellular and parvocellular pathways.** Hee Yeon Im, Reginald B Adams, Jr., Cody A Cushing, Jasmine Boshyan, Noreen Ward, Kestutis Kveraga

36.317 The role of response inconsistency in older adults' face discrimination ability Sarah E. Creighton, Patrick J. Bennett, Allison B. Sekuler

# Sunday Afternoon Posters

36.318 **Recognizing Faces Despite Variability in Appearance:** Learning Mechanisms are Largely Intact in Older Adults Claire M Matthews, Harmonie S.J. Chan, Catherine J. Mondloch

## Color and Light: Psychophysical and neural mechanisms

Sunday, May 20, 2:45 - 6:45 pm, Banyan Breezeway

36.379 **SSVEP amplitudes reflect hue selectivity in the human brain** Sae Kaneko, Ichiro Kuriki, Søren K Andersen

36.320 Any double representation of the fovea? If there are ipsilateral connection from the eye to the LGN, why is there no cortical representation? Mark M Schira

36.327 Population receptive fields in V1 enlarge as luminance is reduced from photopic to scotopic levels Antony B Morland, Barbar Molz, Rebecca Lowndes, Andre Gouws, Heidi Baseler

36.322 Why are hV4 maps incomplete in the left visual cortex but complete in the right hemisphere? Harriet G Boyd Taylor, Mark M Schira, Zoey J Isherwood, Alexander M Puckett

36.323 Dynamics of contrast adaptation in central and peripheral vision Yi Gao, Michael A. Webster, Fang Jiang

36.324 Examining the effect of context on the watercolor illusion Ralph G Hale, James M Brown

36.325 Color AfterImages Determined in Non-Cardinal Color Axes Clemente Paz-Filgueira, Sarah Elliot, Michael Tan, Dingcai Cao

36.326 ChromaBlur: Rendering natural chromatic aberration drives accommodation effectively Martin S Banks, Steven A Cholewiak, Gordon D Love

36.327 Changes in the pupillary and accommodative responses of the human eye under different illuminations Maydel Fernandez-Alonso, Abigail P. Finch, Gordon D. Love, Jenny C. A. Read

36.328 Perceptual effects of delayed cone-opponent signals from an extended surround network: In memory of Daniel J. Plummer Andrew Stockman, Bruce Henning, Andy T. Rider

36.329 S-Cone Filling-in Studied with a Forced-Choice Method Jingyi He, Yesenia Taveras Cruz, Rhea T. Eskew, Jr.

36.330 Ambiguity contributes to grouping of color objects Sunny Meongsun Lee, Emily Slezak, Steven K Shevell

36.337 Separate color systems for different spatial scales Laysa Hedjar, Arthur G. Shapiro

36.332 Chromatic differences between colours retrieved from RGB and hyperspectral images Joao Manuel Maciel Linhares, Cristina Montagner, Ana Bailão, Nobuyo Okada, Kanako Maruchi, Taisei Kondo, Shigeki Nakauchi, Sérgio M. C. Nascimento

36.333 PsychoPysics: a suite of tools for teaching Psychophysics using PsychoPy James A Ferwerda

### Eye Movements: Pursuit, vergence, blink

Sunday, May 20, 2:45 - 6:45 pm, Banyan Breezeway

36.334 Novel Blink Detection Method Based on Pupillometry Noise Ronen Hershman, Avishai Henik, Noga Cohen

36.335 Role of SEF on attentional distribution during smooth pursuit eye movements Zhenlan Jin, Xuejin Ni, Junjun Zhang, Ling Li 36.336 Am I going fast enough to enter the traffic circle? Judging the relative velocities of moving objects Jie Wang, Eileen Kowler

36.337 Assessing Strategies for Involuntary Saccadic Control during Pursuit of Transiently Occluded Targets Conor V Shea, Daniel Bullock, Arash Yazdanbakhsh

36.338 The relative contributions of area MT and the frontal eye fields to the latency of smooth pursuit J. Patrick Mayo, Stephen G. Lisberger

36.339 Eye Movement Correlates of Figure-Ground Segregation and Border-Ownership Mohammad Keshtkar, Shigeaki Nishina, Arash Yazdanbakhsh

36.340 Pursuit eye movements enhance decision making and hitting accuracy in a go/no-go manual interception task Jolande Fooken, Miriam Spering

36.341 Humans compensate for the angular acceleration of an approaching ball-in-flight by coupling movement of the gaze vector to the ball's rate of optical expansion. Gabriel J Diaz, Catherine A Fromm

36.342 Judgments of a target's speed are more precise when the eyes pursue the target Cristina de la Malla, Jeroen B.J. Smeets, Eli Brenner

36.343 **Reinforcement contingencies affect pursuit target selection in healthy and Parkinson's disease participants** Jean-Bernard Damasse, Gurkiran K Mann, Christina B Jones, Martin J McKeown, Miriam Spering, Montagnini Anna

36.344 Anisotropic gaze adaptation in reflexive and voluntary blinks Wee Kiat Lau, Gerrit W Maus

#### **Faces: Emotions**

Sunday, May 20, 2:45 - 6:45 pm, Banyan Breezeway

36.345 **Spatial frequencies for accurate categorization and discrimination of facial expressions** Isabelle Charbonneau, Stéphanie Cormier , Joël Guérette, Marie-Pier Plouffe-Demers, Caroline Blais, Daniel Fiset

36.346 **Spatial frequencies for the visual processing of the facial expression of pain** Joël Guérette, Stéphanie Cormier, Isabelle Charbonneau, Caroline Blais, Daniel Fiset

36.347 A Gaze-Contingent Investigation of the Effect of Perceptual Field Size on Processing Identity and Expression of Faces Jin-Rong Lu, Gary C.-W. Shyi

36.348 Effects of face direction and duration in facial emotion estimation Moeka Nakajima, Katsunori Okajima Moeka Nakajima, Katsunori Okajima

36.349 Perceived gaze direction affects basic cognitive and affective theory of mind processes – an ERP study Sarah D McCrackin, Roxane J Itier

36.350 **Deep Neural Network Identifies Dynamic Facial Action Units from Image Sequences** Tian Xu, Oliver Garrod, Chaona Chen, Rachael E Jack, Philippe G Schyns

36.351 Are face identity and expression processed independently or interactively? A study controlling stimulus and decisional factors Claudia G. Wong, Fabian A. Soto

36.352 **Ten angry men: Serial reproduction of faces reveals that angry faces are represented as more masculine** Stefan Uddenberg, Brian Scholl

36.353 Short exposure duration reveals a smooth transition from priming to adaptation Ka Lon Sou, Hong Xu

36.354 Capacity limitations to extract the mean emotion from multiple facial expressions depend on emotion variance Luyan Ji, Gilles Pourtois

36.355 Attention Modulates the Ensemble Coding of Facial Expressions Haojiang YING, Hong Xu

36.356 Representing Facial Expressions in Visual Working Memory: A Novel Adaptation of the Continuous Response Paradigm Catherine J Mondloch, Abbie L Coy

36.357 **The eyes react to emotional faces in the absence of awareness** Petra Vetter, Stephanie Badde, Elizabeth A Phelps, Marisa Carrasco

36.358 Does the composite face illusion modulate breakthrough of eye-regions from CFS? Katie L.H. Gray, Richard Cook

36.360 Labeling Emotion: Semantic Processing of Facial Expressions Yi-Chen Kuo, Chon-Wen Shyi, Ya-yun Chen

36.367 Negative facial expressions are seen as more intense when viewed in the evening Paul E Moon, Elli B Recht, Hillary R Rodman

36.362 I See What You Mean: The Influence of Alexithymia on the Processing of Nonverbal Cues Pauline Pearson, Lorna S Jakobson

### Spatial Vision: Textures and statistics

Sunday, May 20, 2:45 - 6:45 pm, Banyan Breezeway

36.363 **A Texture Representation Account of Ensemble Perception** Sasen S Cain, Matthew S. Cain

36.364 **Co-circularity aftereffect in texture perception** Hiromi Sato, Frederick A. A. Kingdom, Isamu Motoyoshi

36.365 Estimating number from dot displays relies on a visual sense of number – not on size or spacing Emily M Sanford, Justin Halberda

36.366 **Binocular integration of simultaneous density contrast** Hua-Chun Sun, Curtis L. Baker, Frederick A. A. Kingdom

36.367 The unitary percept of object orientation is achieved through conjoint, not separate processing of horizontal and vertical axes. Lavinia Carmen Uscatescu, Martin Kronbichler, Thomas FitzGerald, Dragan Rangelov

36.368 **Different symmetries, different mechanisms** Ben J Jennings, Frederick AA Kingdom

36.369 **Contextual Effects of High Dynamic Range (HDR) Luminance on Orientation Discrimination** Chou Po Hung, Onyekachi O Odoemene, Andre V Harrison, Anthony J Walker, Min Wei, Anthony Ries, Barry D Vaughan

36.370 Modeling visual sensitivity to spatial correlations in graylevel textures Jonathan Victor, Lilah Evans, Mary M. Conte

36.371 Interaction between form and motion processing contributes to habituation to distortions of the natural visual world Selam Wondimu Habtegiorgis, Caroline Erlenwein, Katharina Rifai, Siegfried Wahl

36.372 Optimal binocular disparity estimation in the presence of natural depth variation Arvind V Iyer, Johannes Burge

36.373 **Temporal Cues to Defocus in Emmetropia and Myopia** Michele Rucci, Jonathan D Victor

36.374 Ideal observer for detection of occluding targets in natural scenes in the fovea and periphery. R Calen Walshe, Stephen Sebastian, Wilson Geisler

### Visual Search: Attention

#### Sunday, May 20, 2:45 - 6:45 pm, Pavilion

36.401 Ignorance vs. laziness: Why do people use suboptimal attentional control strategies? Jessica Irons, Andrew Leber

36.402 Mechanisms behind learned distractor suppression in visual search Marian Sauter, Heinrich R Liesefeld, Hermann J Müller

36.403 Stronger top-down control due to preview visual search produces distractor suppression Kenji Yamauchi, Jun Kawahara

36.404 Not Worth the Effort: Distributed displays and larger set sizes encourage efficient deployment of attention in visual search Stephen C Walenchok, Stephen D Goldinger

36.405 A secondary task leads to poorer selection of attentional control strategies Heather A Hansen, Jessica L Irons, Andrew B Leber

36.406 **Understanding Visual Search and Foraging in Cognitive Development** Beatriz Gil-Gómez de Liaño, María Quirós-Godoy, Elena Pérez-Hernández, Matthew S Cain, Jeremy M Wolfe

36.407 Feature integration across the dorsal and ventral streams in childhood Andrew Lynn, Elena K Festa, William C Heindel, Dima Amso

36.408 Individual Differences in Visual Search and Foraging in children María Quirós-Godoy, Elena Pérez-Hernández, Matthew S Cain, Jeremy M Wolfe, Beatriz Gil-Gómez de Liaño

36.409 Visual search slopes are not caused by increased distractor numbers: Insights from visual foraging Tomas Kristjansson, Árni Kristjánsson

36.410 The Flux Capacitor Account: A New Account of Multiple Target Visual Search Errors Stephen Adamo, Joseph C Nah, Andrew J Collegio, Paul S Scotti, Sarah Shomstein

36.411 What Can Intraindividual Variability Teach Us About Dual-Target Visual Search? Robert Sall, Emily Lefebvre, Shevaun D Neupert, Jing Feng

36.412 **Abolition of Search Asymmetry** Ronald A Rensink, Sogol Ghattan-Kashani, Emily S Cramer

36.413 Distractor specificity leads to contextual cueing effects in target-absent search condition Jeunghwan Choi, Sang Chul Chong

36.414 Task relevance affects the context-dependency of implicit learning Injae Hong, Su Keun Jeong, Min-Shik Kim

36.415 When does implicitly-learned spatial context bias attention? Yoolim Hong, Andrew B. Leber

36.416 How do 25,000+ visual searches change the visual system? Igor S. Utochkin, Jeremy M. Wolfe

36.417 Active response inhibition impairs subsequent search efficiency Yoojeong Choo , Do-Joon Yi

36.418 The influence of temporal structure on visual search: How prediction shapes top-down and bottom-up attention Danlei Chen, J. Benjamin Hutchinson

### Visual Search: Real world

Sunday, May 20, 2:45 - 6:45 pm, Pavilion

36.419 Exploring the Effect of Task Complexity, Presentation, and Input Device on the Near-Hands Advantage Ronald Andringa, Nelson A Roque, Walter R Boot

36.420 How optimal strategies evolve in memory-guided visual search: evidence from eye movement patterns. Alicia Weisener, Roger Johansson

36.421 Exploring the utility of incidental fixations in dynamic real-world visual search through mobile eye tracking Grace L Nicora David Alonso Kristina M Rand Sarah Groom Rogehr Trafto

Nicora, David Alonso, Kristina M Rand, Sarah Creem-Regehr, Trafton Drew

36.422 Don't Look Now: The influence of distractor features vs. spatial relevance on attentional deployment Ellen O'Donoghue, Monica S Castelhano

36.423 Visual Search for Medication Vials Evan M Palmer, Logan M Gisick

36.424 Sequence Learning in Hybrid Visual Search Erica Westenberg, Jeremy Wolfe, Iris Wiegand

36.425 **Detecting and localizing prostate lesions within half a second** Melissa Trevino, Todd S Horowitz, Ismail B Turkbey, Peter L Choyke, Marcin Czarniecki

36.426 Examining the effects of task-irrelevant emotional scenes and individual differences in personality characteristics on performance in a visual search task Monica L Rosen, Lauren Bandel, Karl Kuntzelman, Michael D Dodd

36.427 Differences in Search Mechanics for Anxious Individuals and Individuals with an Autism Spectrum Disorder During Real-World Visual Search Tasks Nicholas C.C. Russell, David N. Top, Mikle South, Steven Luke

36.428 Using Virtual Reality [VR] to assess the effects of asymmetric vision loss on visual search performance Hugo T Chow-Wing-Bom, Tessa M Dekker, Pete R Jones

### Perception and Action: Decision making

Sunday, May 20, 2:45 - 6:45 pm, Pavilion

36.430 Sequential Effects in Confidence Shannon M Locke, Pascal Mamassian, Michael S Landy

36.431 Serial dependence for discriminating grating orientation at threshold contrast is driven by perceptual decisions Huihui Zhang, David Alais

36.432 **Perceptual explaining away in depth judgements** Nils Neupärtl, Constantin A. Rothkopf

36.433 **The Neurodynamic Decision Variable in Human Multi-Alternative Perceptual Choice** Kielan Yarrow, Carmen Kohl, Laure Spieser, Bettina Forster, Sven Bestmann

36.434 Understanding the accuracy-RT relationship: Model-free approaches and limitations of the drift diffusion model Farshad Rafiei, Dobromir Rahnev

36.435 Decision-stage representation: Full distribution over possible choices or information about the most likely choice only? Jiwon Yeon, Dobromir Rahnev

36.436 HD-tDCS over right frontal eye field biases expectation in a free choice saccade task Brandon J Caie, Jerrold Jeyachandra, Aarlenne Z Khan, Gunnar Blohm

36.437 Distinguishing the roles of dorsolateral and anterior PFC in visual metacognition Medha Shekhar, Dobromir Rahnev

36.438 **Prospective decision making for dynamic visual stimuli** Ryuto Yashiro, Isamu Motoyoshi

36.439 Motion fluency and object preference: Robust perceptual but fragile memory effects. Jonathan C Flavell, Bryony McKean, Steven P Tipper, Alexander J Kirkham, Tim Vestner, Harriet Over

36.440 **Feature-continuous motion judgements: Assessing different random dot motion displays** Riccardo Barbieri, Felix Töpfer, Joram Soch, Carsten Bogler, John-Dylan Haynes 36.441 **Cognitive models modulate action-perception coupling in perceptual multistability** Peter Veto, Marvin Uhlig, Nikolaus F. Troje, Wolfgang Einhäuser

36.442 That was awkward! How greetings go awry Hongjing Lu, Akila Kadambi, Nick Ichien, Shuwen Qiu

#### Visual Memory: Working memory

Sunday, May 20, 2:45 - 6:45 pm, Pavilion

36.443 We are not all the same: Different memory limits reveal different memory processes. Young Seon Shin, Summer Sheremata

36.444 No distinction between capacity and resolution in working memory: A single memory strength parameter explains the shape of visual working memory response distributions Timothy F Brady, Mark W Schurgin, John T Wixted

36.445 Sources of Error Underlying Visual Working Memory Manipulation Hrag Pailian, George Alvarez

36.446 Distinct Attention and Working Memory Mechanisms Protect Internal Representations from Interruption Nicole Hakim, Tobias Feldmann-Wustefeld, Edward Awh, Edward K Vogel

36.447 The role of feature binding in the relationship between visual attention and visual short-term memory Ivan D Annicchiarico, Summer Sheremata

36.448 Both bottom-up and top-down control influence multiple working memory-driven attentional selection Lingxia Fan, Xuemin Zhang

36.449 **Contextual information of a memory episode influences serial dependence** Cora Fischer, Stefan Czoschke, Benjamin Peters, Benjamin Rahm, Jochen Kaiser, Christoph Bledowski

36.450 **Probabilistic retro-cues do not determine representational state in visual working memory** Blaire Dube, Alanna Lumsden, Naseem Al-Aidroos

36.451 Similar items repel each other in visual working memory Chaipat Chunharas, Timothy F Brady, Rosanne L Rademaker, John T Serences

36.452 Reduced oculomotor capture by working memory contents under two- vs. one-item memory load suggests one item at a time is held in an active state Valerie M Beck, Timothy J Vickery

36.453 Independent stores for relative and absolute spatial location in visuospatial working memory David Aagten-Murphy, Paul M Bays

36.454 **Multiple visual working memory items can guide attention and facilitate perceptual processing** Jamal R Williams, Timothy F Brady, Viola S Störmer

36.455 The Effects of Structural Regularity on Working Memory Representations Lilian Azer, Weiwei Zhang

36.456 Is source information automatically available in working memory? Hui Chen, Richard Carlson, Brad Wyble

36.457 Strategic working memory performance may confound the interpretation of cumulative task statistics Benjamin E Cuthbert, Dominic Standage, Martin Paré, Gunnar Blohm

36.458 **The role of task-irrelevant space in non-spatial working memory** Masih Rahmati, Thomas C Sprague, Clayton E Curtis, Kartik K Sreenivasan

36.459 Using affective ratings to test competing hypotheses about differences in active and accessory states in visual working memory. David De Vito, Mark J. Fenske 36.460 Cerebellum added to Working Memory Networks revealed by Meta-analysis of Activation Likelihood Estimation of fMRI sites in n-back tasks Sheila Crewther, Gemma Lamp, Peter Goodin, Robin Laycock, David Crewther

36.461 Atomoxetine has no effects on visual working memory but benefits motivation Mavis Kusi, Lindsey T. Thurston, Catherine Crandell, Martin Paré

36.462 The impact of topological change on visual working memory updating ning wei, tiangang zhou, yan zhuo, lin chen

36.463 Visual interference does not contaminate working memory: Testing the "perceptual reuse" theory Qian Yu, Chaz Firestone, Jonathan I. Flombaum, Marina Bedny, Justin Halberda

36.464 Efficient coding in visual working memory accounts for stimulus-specific variations in orientation recall Robert Taylor, Paul M Bays

36.465 From location to configuration: Does the Structure of a Display stick in memory as strongly as target location? Ryan E O'Donnell, Hui Chen, Baruch Eitam, Brad Wyble

36.466 The minimal proactive interference observed with realworld objects in a visual working memory task is not location-specific Robert Walter, Timothy F Brady

36.467 Comparing the capacity limitations of working memory for locations and features Cody W McCants, Tobias Katus, Martin Eimer

36.468 Working memory for sequentially presented objects does not rely on location to bind features Sebastian Schneegans, William J Harrison, Paul M Bays

36.469 How does aging affect the human visual short-term memory task for object-location and name-location binding? Raju P Sapkota, Ian van der Linde, Shahina Pardhan

36.470 Using performance discontinuities to estimate individual Working-Memory Capacities in serial recall tasks Jonas K Lindeløv

36.471 Does visual working memory adapt to the nature of anticipated interference? Benchi Wang, Jan Theeuwes, Christian N.L. Olivers

36.472 Real-world objects are not stored in bound representations in visual working memory Yuri A. Markov, Igor S. Utochkin, Timothy F Brady

36.473 The Capacity for Depth: Working Memory in Multiple Depth Planes Dawn M Sarno, Mark B Neider

36.474 Working memory for depth indicates a serial-position effect Ke Zhang, Jiehui Qian

36.475 Agent Identity Drives Adaptive Encoding of Biological Motion into Working Memory Quan Gu, Zaifeng Gao, Xiaochi Ma, Xiqian Lu, Hui Chen, Mowei Shen

36.476 The effects of aroma on capacity and precision of working memory Motohiro Ito, Jun I Kawahara

36.477 The Mental Muscle: Effects of Concurrent Effortful Physical Action on Visual Working Memory Marcus J Cappiello, Weizhen Xie, Weiwei Zhang

36.478 Attentional responses while looking for changes: effect of pathological ageing. Moreno I Coco, Carolina Maruta, Mário Carvalho, Catarina Campos, José Santos Victor, Isabel Pavâo Martins, Sergio Della Sala



### Faces: Development and disorders

Monday, May 21, 8:15 - 9:45 am, Talk Room 1 Moderator: Sheng He

41.11, 8:15 am Infants preferentially attend to faces when viewing them with the left eye but not the right eye Kirsten A Dalrymple, Brad Duchaine, Jed T Elison

41.12, 8:30 am Early visual exposure to faces is sufficient and necessary for prepping the FFA for future specialization in tactile face processing in the blind Rui Dai, Zirui Huang, Xuchu Weng, Sheng He

41.13, 8:45 am **The Perceptual Deficit in Congenital Prosopagnosia** Irving Biederman, Emily X Meschke, Rafael S Maarek, Eshed Margalit, Sarah B Herald

41.14, 9:00 am Deficient learning from unfamiliar face repetitions in developmental prosopagnosia: evidence from diminished fMRI repetition suppression of the FFA and decreased multivoxel pattern similarity of the MTL Yuan-Fang Zhao, Yiying Song, Jia Liu

41.15, 9:15 am Mismatch of face fixation preference and retinotopic tuning of face perception in autism spectrum condition Matthew F Peterson, Amanda J Haskins, Ian Zaun, Nancy Kanwisher

41.16, 9:30 am Reduced neural sensitivity for implicit individual face discrimination in autism Sofie Vettori, Milena Dzhelyova, Stephanie Van der Donck, Corentin Jacques, Jean Steyaert, Bruno Rossion, Bart Boets

### 3D Perception: Objects and surfaces

Monday, May 21, 10:45 am - 12:15 pm, Talk Room 1 Moderator: Erich Graf

42.11, 10:45 am Monocular and binocular recovery of 3D symmetrical and near-symmetrical shapes Vijai Thottathil Jayadevan, Tadamasa Sawada, Edward Delp, Zygmunt Pizlo

42.12, 11:00 am Changes in Viewing Distance Produce Systematic Distortions of the Apparent 3D Shapes of Symmetric Polyhedra Ying Yu, James T Todd, Alexander A Petrov

42.13, 11:15 am Which parts of a shaded image relate invariably to which parts of a 3D shape? Benjamin S Kunsberg, Steven W Zucker

42.14, 11:30 am **Binocular depth cues break camouflage** Wendy J Adams, Matt Anderson, Erich W Graf

42.15, 11:45 am Half-occlusion boundary detectors in computational stereo vision Jialiang Wang, Daniel Glasner, Todd Zickler

42.16, 12:00 pm Use of continuous 3D target-tracking in VR to measure response latency to changes in depth Benjamin T. Backus, James J. Blaha, Lawrence K. Cormack, Kathryn L. Bonnen

# Monday Morning Talks

### **Temporal Processing**

Monday, May 21, 8:15 - 9:45 am, Talk Room 2 Moderator: David Alais

41.21, 8:15 am Differential recalibrations of perception and decision underlying the central tendency of time perception Saya Kashiwakura, Isamu Motoyoshi

41.22, 8:30 am When a visual event is perceived depends on where it is presented Ljubica Jovanovic, Pascal Mamassian

41.23, 8:45 am Interhemispheric visual temporal order adaptation Zhimin Chen, Ikuya Murakami, David Whitney

41.24, 9:00 am Reverse Radial Bias: Temporal Orientation Bias Compensation in Early Visual Areas Revealed by MEG Huining Wu, Ikegaya Yuji, Hiroshi Ban

41.25, 9:15 am **Convolutional recurrent neural network models** of dynamics in higher visual cortex Aran Nayebi, Jonas Kubilius, Daniel Bear, Surya Ganguli, James J DiCarlo, Daniel L K Yamins

41.26, 9:30 am Information sampling and processing during visual recognition Laurent Caplette, Karim Jerbi, Frédéric Gosselin

### Attention: Temporal, tracking and divided

Monday, May 21, 10:45 am - 12:15 pm, Talk Room 2

Moderator: Yuhong Jiang

42.21, 10:45 am Flanking Distractors are Recognized and Suppressed Before the Target is Identified Ricardo Max, Yehoshua Tsal, Marisa Carrasco

42.22, 11:00 am Characteristics of sustaining attention in a gradual-onset continuous performance task Jihyang Jun, Roger Remington, Wilma Koutstaal, Yuhong V. Jiang

42.23, 11:15 am Attention explores space at the theta frequency Laura Dugué, Mehdi Senoussi, James C Moreland, Niko A Busch

42.24, 11:30 am Tracking of moving players in soccer: Multiple object tracking in real-life environment Lauri O Oksama, Teemu Leino, Jukka Hyönä

42.25, 11:45 am Mapping glaucomatous visual fields during panoramic driving simulation David E Anderson, Deepta Ghate, Sachin Kedar, Vikas Gulati, Madeleine Sharp, Matthew Rizzo

42.26, 12:00 pm Anxious Anticipation Prolongs the Emotion-induced Blindness Effect Nadia Haddara, Jonathan Ravid, Erica Miller, Molly O'Hagan, Chris Caracciolo, Ryan O'Rourke, Jourdan Pouliot, Stacey Davis, L. Jack Rhodes, Vladimir Miskovic

# Monday Morning Posters

### Scene Perception: Mechanisms and models

Monday, May 21, 8:30 am - 12:30 pm, Banyan Breezeway

43.301 Neural representation of the intuitive physical dimension of mass Sarah E Schwettmann, Jason Fischer, Joshua B. Tenenbaum, Nancy Kanwisher

43.302 Scaling Up Neural Datasets: A public fMRI dataset of 5000 scenes Nai Chen Chang, Elissa Aminoff, John Pyles, Michael Tarr, Abhinav Gupta

43.303 Early electrophysiological markers of navigational affordances in scenes Assaf Harel, Jeffrey D Nador, Michael F Bonner, Russell A Epstein

43.304 Investigating the temporal dynamics of object-scene integration using MVPA: The role of the N300/N400 complex in object perception Dejan Draschkow, Edvard Heikel, Melissa L.-H. Võ, Christian Fiebach, Jona Sassenhagen

43.305 Dynamic Construction of Feature-Based Representations for Perceptual Decisions in the Occipito-Ventral Pathway Jiayu Zhan, Robin Ince, Nicola Van Rijsbergen, Philippe Schyns

43.306 Transfer of Diagnostic Features from Occipital Cortex to right Fusiform Gyrus for Perceptual Decisions Yaocong Duan, Jiayu Zhan, Robin Ince, Nicola van Rijsbergen, Philippe Schyns

43.307 Mapping the neuroelectric state-space geometry of natural scenes Bruce C Hansen, David J Field, Michelle R Greene, Cassady Olson, Vladimir Miskovic, L Jack Rhodes

43.308 The contrast response function is enhanced according to local subjective importance in natural images Wietske Zuiderbaan, Serge O Dumoulin

43.309 Coding of navigational distance in the visual scene-selective cortex Jeongho Park, Soojin Park

43.310 **Dynamics of "Gist" Processing** Karla K Evans, Lucy J Spencer, Daniel H Baker

43.311 Strategic Deployment of Attention in Online Causal Judgment: A Computational Model Andrew Lovett, Gordon Briggs, Kevin O'Neill, Paul Bello

43.312 Dissociable dynamic network organization states for representations of relative and absolute spatial relations Xin Hao, Zhencai Chen, Yiying Song, Xiangzhen Kong, Jia Liu

43.313 Neural representations of reachspaces dissociate from scenes and objects Emilie L Josephs, Talia Konkle

43.314 A Graph-like Neural Representation of Indoor Spaces Revealed Using fMRI Liwei Sun, Sebastian M. Frank, Peter U. Tse

43.315 **Perceiving the average blur in images** Siddhart Srivatsav Rajendran, Courtney Matera, Michael A Webster

43.316 A Top-Down, Scene Model-Based Perceptual Aftereffect Allan C. Dobbins, Jon K. Grossmann

43.317 Separable effects of similarity and contrast on detection in natural backgrounds Carlos Dorronsoro, Calen Walshe, Steve Sebastian, Wilson S Geisler

43.318 High-level image structure modulates low-level orientation sensitivity Christianne JH Jacobs, Charlotte Raskopf, Kirsten Petras, Valerie Goffaux

43.319 **Measuring local symmetry in real-world scenes** John D Wilder\*, Morteza Rezanejad\*, Kaleem Siddiqi, Sven Dickinson, Allan Jepson, Dirk B Walther \*contributed equally

43.320 A causal model of recursive scene parsing in human perception Ning Tang, Haokui Xu, Jifan Zhou, Rende Shui, Mowei Shen, Tao Gao

### Perceptual Learning: Models and neural mechanisms

Monday, May 21, 8:30 am - 12:30 pm, Banyan Breezeway

43.321 Estimates of category means are biased away from the category boundary following an orientation-categorization task Chris W Grimmick, Elyse H Norton, Michael S Landy

43.322 Modelling network mechanisms for maintaining neural population homeostasis in visual adaptation Xuexin Wei, Kenneth D Miller

43.323 **A Large Scale Video Dataset for Event Recognition** Mathew Monfort, Bolei Zhou, Sarah Adel Bargal, Alex Andonian, Kandan Ramakrishnan, Carl Vondrick, Aude Oliva

43.324 Task Difficulty Mediates the Effects of Roving on Performance Gizay Ceylan, Aaron M Clarke

43.326 **Perceptual learning trial-by- trial in a task-roving paradigm** Jiajuan Liu, Barbara Dosher, Zhong-Lin Lu

43.327 **Perturbation Tolerance of Deep Neural Networks and Humans in Material Recognition** Xing Liu, Masataka Sawayama, Ryusuke Hayashi, Mete Ozay, Takayuki Okatani, Shin'ya Nishida

43.328 Effect of perceptual training on neural correlates of radial-tangential anisotropy in visual crowding Mark Greenlee, Maka Malania, Maja Traurig, Tina Plank

43.329 Global network reorganization induced by short-term visual association learning Mengxia Yu, Yiying Song, Jia Liu

43.330 Feature-based plasticity revealed by decoded fMRI neural feedback (DecNef) Zhiyan Wang, Masako Tamaki, Kazuhisa Shibata, Michael S. Worden, Yuka Sasaki, Takeo Watanabe

43.331 Finding the baby in the bath water – evidence for training-specific changes in MRI measures of brain structure and function Cibu P Thomas, Adam Steel, Aaron Trefler, Elizabeth Aguila, Gang Chen, Carlo Pierpaoli, Chris Baker

43.332 Early visual cortex underlies modulation of reactivated perceptual learning Dean Shmuel, Haggai Sharon, Nitzan Censor

43.333 Indirect measures of visual cortex plasticity and GABA concentration are not correlated in adults with normal vision Dania Abuleil, Daphne L McCulloch, Benjamin Thompson

43.334 Changing object representations during visual production training Jeffrey D Wammes, Judith Fan, Rachel Lee, Jordan Gunn, Daniel Yamins, Kenneth Norman, Nicholas Turk-Browne

43.335 Later visual areas can adapt to adapted input from earlier visual areas. Xinyu Liu, Juraj Mesik, Stephen A Engel

43.336 Long-term contrast deprivation increases neural gain in early visual cortex Stephen A Engel, Juraj Mesik, Mark Vergeer

43.337 **Transcranial random noise stimulation over early visual cortex improves processing of noisy visual stimuli** Michael D Melnick, Woon Ju Park, Sholei Croom, Shuyi Chen, Ania C Busza, Lorella Batelli, Krystel R Huxlin, Duje Tadin

43.338 Changes in Extrastriate Cortical Thickness Caused by Macular Degeneration Matthew K Defenderfer, Leland L Fleming, Kristina M Visscher 43.339 Using fMRI to Identify Neuronal Mechanisms of Motion Detection Underlying Blindsight Michèle W MacLean, Vanessa Hadid, Latifa Lazzouni, Franco Lepore

43.340 **Cortical reorganization but no recovery of visual function following an optic nerve injury in mice** Jacqueline L Higgins, Marianne Groleau, Jérôme Anton, Mojtaba Nazari, Matthieu Vanni, Majid H Mohajerani, Elvire Vaucher

### Development: Lifespan and models

Monday, May 21, 8:30 am - 12:30 pm, Banyan Breezeway

43.341 Computational Study of Changes to Cortical Vision with Age Sarah Cavanagh, Daniel D Leeds

43.342 **Pinwheel-like Iso-Orientation Domains in a Convolutional Neural Network Model** Eshed Margalit, Hyodong Lee, James J DiCarlo, Daniel LK Yamins

43.343 Body Coding Mechanisms in 9- to 10-Year-Old Children and Young Adults Astrid Hönekopp, Annika C. Just, Sarah Weigelt, Kami Koldewyn

43.344 Heritability of the human visual connectome Koen V Haak, Christian F Beckmann

43.345 Malleability of speed accuracy trade-offs across the adult lifespan Jutta Billino, Elena Hitzel, Constanze Hesse

43.346 **Age effects on category rule learning** Clay D Killingsworth, Audrey Hill, Pooja Patel, Anna Guidubaldi, Drew Gillett, Mark Neider, Corey Bohil

43.347 How to classify visual illusions? The role of intellectual development. Aline F. Cretenoud, Lukasz Grzeczkowski, Michael H. Herzog

43.348 **The Development of Social Interaction Perception in the Brain** Kami Koldewyn, Ioana Mihai, Jon Walbrin

43.349 **Development of the contrast sensitivity function** Jessica Tardif, Laveniya Kugathasan, Frédéric Gosselin, Deborah Giaschi

43.350 Maturation of visuomotor coordination and motion-defined form perception in typically-developing children Deborah Giaschi, Kimberly Meier, Violet Chu, Pamela Bryden, Ewa Niechwiej-Szwedo

43.351 Multiple object tracking via sustained multifocal attention in children Tashauna L Blankenship, Roger W Strong, Melissa M Kibbe

43.352 Visual temporal integration windows are adult-like in typically developing 5-7-year-old children. Julie Freschl, David Melcher, Zsuzsa Kaldy, Erik Blaser

43.353 **Investigating the development of the human visual system with fMRI in awake, behaving infants** Cameron T Ellis, Lena J Skalaban , Natalia I Cordova, Javier S Turek, Vikranth R Bejjanki, Nicholas B Turk-Browne

43.354 **The psychophysics of newborn infant vision assessment** Angela M Brown, Faustina O Opoku, Delwin T Lindsey

43.355 **Development of Pursuit of a Random Walk by Infants aged 4 to 17 Week** Colin O Downey, Griffin C Pace, Larry K Cormack, Scott B Stevenson, Tracey Rowan Candy

43.356 Infants' detection of self-shadow change and object's shape change Kazuki Sato, So Kanazawa, Masami K. Yamaguchi

43.357 Infants' ability to detect and learn faces during rapid serial visual presentation Shuma Tsurumi, So Kanazawa, Masami K Yamaguchi, Jun Kawahara 43.359 Maternal odor shapes rapid face categorization in the 4-month-old infant brain Arnaud Leleu, Diane Rekow, Fanny Poncet, Bruno Rossion, Karine Durand, Benoist Schaal, Jean-Yves Baudouin

### Multisensory Processing: Vision, vestibular, models

Monday, May 21, 8:30 am - 12:30 pm, Banyan Breezeway

43.360 Experimentally disambiguating models of sensory cue combination Peter Scarfe, Andrew Glennerster

43.361 Differential processing delays cause the onset of the rodand-frame illusion to precede the onset of the frame Jeffrey M Peterson, Paul Dassonville

43.362 Dynamics of spatial updating during whole-body passive translation Florian Perdreau, Pieter W Medendorp

43.363 Sensitivity to visual gain modulation in head-mounted displays depends on fixation Matthew J Moroz, Garzorz Isabelle, MacNeilage Paul, Folmer Eelke

43.364 **Perceived size during visually simulated self-motion** JongJin Kim, Laurence R Harris

43.365 **Gender bias in the influence of gravity on perception** Laurence Harris, Sandra Felsner, Michael Jenkin, Rainer Herpers, Alexandra Noppe, Timo Frett, David Scherfgen

## Perceptual Organization: Contours and surfaces

Monday, May 21, 8:30 am - 12:30 pm, Banyan Breezeway

43.366 The Motion-Induced Contour Revisited: Rotations in depth reveal novel illusory contours Gideon P. Caplovitz, Gennady Erlikhman

43.367 How texture elements are combined to detect boundaries: A machine learning approach Christopher J DiMattina, Curtis L Baker

43.368 **Examining the influence of edge length, distance, and orientation on the Motion-Induced Contour** Mengzhu Fu, Gennady Erlikhman, Gideon P Caplovitz, Michael D Dodd

43.369 Detecting mean shift integrality using the Hering illusion: initial results using general recognition theory and systems factorial theory Michael Wenger, Douglas Bryant, James Townsend, Ru Zhang, Yanjun Liu

43.370 **EEG Correlates of Contour Integration in Younger and Older Adults** Allison B Sekuler, Eugenie Roudaia, Ali Hashemi, Jessica N Cali, Patrick J Bennett

43.371 Does cultural background influence a viewer's Muller-Lyer illusion? Milena Krstic, Zili Liu

43.372 **Comparing the ability of humans and DNNs to recognise closed contours in cluttered images** Christina M Funke, Judy Borowski, Thomas S. A. Wallis, Wieland Brendel, Alexander S. Ecker, Matthias Bethge

43.373 Border Ownership Assignment based on Dorsal and Horizontal Modulations Paria Mehrani, John K. Tsotsos

43.374 **The event-related potential signature of adaptation to contours and textures** Damien Wright, Jasna Martinovic, Elena Gheorghiu

43.375 **The dynamics of eye movement behavior during a contour integration task** Carly J. Leonard, Caleb Dewey, Alexa Steed

43.376 Comparing filling-in of spatiotemporal patterns in the blind spot, under occlusion, and across artificial scotomata Yulia Revina, Gerrit Maus 43.377 Using artificial scotoma fading to explore antagonistic interactions in figure-ground perception. Richard W Plummer, James M Brown, Jaeseon Song

43.378 Surface integration tendency determines relative depth order between two perceptually interpolated surfaces Chao Han, Teng Leng Ooi, Zijiang He

43.379 Motion tuning and element lifetime properties of symmetry detection mechanisms Rebecca J Sharman, Elena Gheorghiu

43.380 Visual cortex is sensitive to order-disorder phase transition Mikhail Katkov, Francesca Strappini , Tomer Livne, Sabrina Pitzalis, Dov Sagi, Rafi Malach

### Visual Search: Memory

Monday, May 21, 8:30 am - 12:30 pm, Pavilion

43.401 An individual difference examination of the relationship between spatial working memory abilities and contextual cueing. Kirk Ballew, Alejandro Lleras, Simona Buetti

43.402 Target Category Repetition Reduces the Reliance on Visual Working Memory as Measured by Contralateral Delay Activity Ashley M Ercolino, Joseph Schmidt

43.403 **Relevance Effects in Repeated Visual Search** Sebastian A. Bauch, Christof Körner, Iain D. Gilchrist, Margit Höfler

43.404 How information in working memory affects attentional control in older and young adults? Jian Guo, Takatsune Kumada

43.405 Enhanced distractor memory following difficult search: The role of attention allocation in incidental encoding Juan D Guevara Pinto, Megan H Papesh, Stephen D Goldinger, Michael C Hout

43.406 **Cued by the bzzzzzzz?! The influence of object sounds on visual search and memory performance** Caroline D Seidel, Dejan Draschkow, Melissa L.-H. Võ

43.407 How NOT to cure the incidental finding problem in radiology: Experience with "mixed hybrid" visual and memory search Makaela S. Nartker, Jeremy M. Wolfe

### **Visual Memory: Contents**

Monday, May 21, 8:30 am - 12:30 pm, Pavilion

43.408 Binding of Color and Shape in Visual Working Memory Survives Dynamic Object Tracking Jun Saiki

43.409 Examining the Impact of Item-Distractor Similarity Using a Validated Circular Shape Space Aedan Y Li, Celia O Fidalgo, Jackson Liang, Andy C H Lee, Morgan D Barense

43.410 Similarity-based clusters are the representational units of visual working memory Gaeun Son, Byung-Il Oh, Min-Suk Kang, Sang Chul Chong

43.411 The time course of selective encoding and maintenance of task-relevant object features in working memory. Andrea Bocincova, Jeffrey S. Johnson

43.412 Objects are represented as integrated items in visual memory Dana Assaf, Halely Balaban, Roy Luria

43.413 Knowledge about real-world objects influences visual working memory capacity Ariel Starr, Mahesh Srinivasan, Silvia A Bunge

43.414 The Number of Representations within the Focus of Attention in Visual Working Memory Hyung-Bum Park, Weiwei Zhang

43.415 Capacity for Visual Features in Mental Rotation is Persistently Low Nicole L Jardine, Steven L Franconeri

43.416 The psychophysical properties of working memory and mental rotation reveal different processes Joel Robitaille, Stephen M. Emrich

43.417 **Comparing memory based on visual recall, visual recognition, and verbal recall** Elizabeth H. Hall, Wilma A. Bainbridge, Chris I. Baker

43.418 **Do occluding boundaries extend in visual memory?** Carrick C Williams, Kelly Edwards

43.420 **Representational dynamics of number processing in symbolic and non-symbolic formats** Daniel Janini, Brett B Bankson, Chris I Baker

### Visual Memory: Encoding and retrieval

Monday, May 21, 8:30 am - 12:30 pm, Pavilion

43.421 Quantifying sensory noise in serial dependence experiments with a two alternative forced choice (2AFC) paradigm Fraser R Aitken, Justin M Ales

43.422 **Flexible visual memory encoding revealed by probing method** Arni Gunnar Asgeirsson, Christian Barckmann, Sandra Dögg Þórudóttir, María Jóhannesdóttir Peteresn

43.423 **The efficacy of retroactive control of visual memory encoding depends on preceding oscillatory activities.** April E Pereira, Keisuke Fukuda

43.424 The magical number 4 limits selection of object categories for encoding into visual long-term memory Derek K McClellan, D. Alexander Varakin, Amanda J Renfro, Jason Hays

43.425 Characterizing Memory Allocation Strategies in Transsaccadic Integration Jennifer L Bittner, Melchi M Michel

43.426 Implicit ensemble bias in feature recall Ke Tong, Chad Dubé

43.427 **Perceptual blurring and recognition memory: A differential memory effect in pupil responses** Hanae Davis, Ali Hashemi, Bruce Milliken, Patrick J Bennett

43.428 Decoding retrieved episodic memory in the prefrontal and parietal cortex Gayoung Kim, Sue-Hyun Lee

43.429 **Context-based competition during memory retrieval triggers forgetting** Stephanie Jeanneret, Evan Roche, Augustin Hennings, Anthony Dutcher, Mark Hollenbeck, Jarrod A Lewis-Peacock

43.430 Effects of title wording on memory of trends in line graphs Anelise P Newman, Zoya Bylinskii, Steve Haroz, Spandan Madan, Fredo Durand, Aude Oliva

### Perception and Action: Arm movements and tools

Monday, May 21, 8:30 am - 12:30 pm, Pavilion

43.431 Relative Phase Coordination at 900 Does Not Exhibit Phase Switching, as Does 1800 Rachel A Herth, Winona Snapp-Childs, Geoff P Bingham

43.432 Visual Biases Near Hand-held and Remotely Controlled Tools Robert McManus, Laura E. Thomas

43.433 **The effect of prolonged exposure to feedback delay on body ownership, agency and presence in virtual reality** Loes CJ van Dam, Josie R. Stephens

43.434 Sensitivity to Illusory Target Motion in Elderly and Association with Problems in the Activities of Daily Life Alix L de Dieuleveult, Anne-Marie Brouwer, Petra C Siemonsma, Jan BF van Erp

43.435 **Perceive Bigger, Hit Better** Misong Kim, Seung-hoon Choi, Hwa-kyoung Jung, Na-ri Jung, Hoon Choi

**Monday AM** 

43.436 Influence of background optical illusions on guided hand movements Kazuki Konno, Ruggero Micheletto

43.437 Is deciding to act or executing the action critical for the action effect? Blaire J Weidler, Richard A Abrams, Jay Pratt

43.438 **Transfer of visuomotor adaptation between eye and hand tracking** James Mathew, Cedric Goulon, Frederic Danion

43.439 Different ways of correcting for previous temporal errors in interception tasks. Joan López-Moliner, Cécile Vullings, Laurent Madelain, Robert J van Beers

43.440 **Priming with flash-lag illusion is percept-dependent** Marjan Persuh, Dinara Guliyeva

#### Spatial Vision: Crowding and eccentricity

Monday, May 21, 8:30 am - 12:30 pm, Pavilion

43.441 Visual crowding effect in the Parvocellular and Magnocellular visual pathways Nilsu Atilgan, Sheng He

43.442 Characterizing neural processing in foveal primary visual cortex Felix Bartsch, Daniel A Butts, Bruce G Cumming

43.443 **Appearance of complex stimuli in the peripheral visual field** Matteo Valsecchi, Jan Koenderink, Andrea van Doorn, Karl R. Gegenfurtner

43.444 Do you see how many I see? Quantifying human crowd counting accuracy over natural scenes Logan Blake, Ali Borji

43.445 The Effect of Multiple Object Tracking on Peripheral Crowding Lilit G. Dulyan, Igor S. Utochkin

43.446 Separating effects of texturization and segmentation in visual crowding Cathleen M Moore, Marisol Lauffer

43.447 Revealing the mechanisms underlying inner-outer asymmetry and visual crowding Jun-Yun Zhang, Gong-Liang Zhang, Cong Yu

43.448 Age-related loss of retinal ganglion cells and its impact on spatial integration Rong Liu, MiYoung Kwon

43.449 **Crowding distance in healthy children.** Sarah J Waugh, Denis G Pelli, Leticia Álvaro, Monika A Formankiewicz

43.450 **Conservation of crowding distance in human V4** Jingyang Zhou, Noah C Benson, Jonathan Winawer, Denis G Pelli

43.451 Repetitive visual pattern masking enlarges the perceived distance between stimuli (but does not diminish crowding) Sabine Born

### Color and Light: Cognition and preference

Monday, May 21, 8:30 am - 12:30 pm, Pavilion

43.452 **Sound symbolism expressing visual texture on different linguistic backgrounds** Kohta Wakamatsu, Jinhwan Kwon, Maki Sakamoto, Shigeki Nakauchi

43.453 Interpreting color-coding systems: the effects of concept activation on color inference Kathleen C. Foley, Laurent Lessard, Karen B. Schloss

43.454 What does color sorting tell us about lexical color categorical structure? Delwin Lindsey, Aimee Violette, Angela M Brown, Prutha Deshpande

43.455 Tomatoes are red, cucumbers are green: Decoding the temporal dynamics of object-colour knowledge using Magnetoencephalography Lina Teichmann, Tijl Grootswagers, Thomas A Carlson, Anina N Rich

43.456 Isolating perception by fooling cognition: Does color knowledge alter color appearance? J.J. Valenti, Chaz Firestone

43.457 **Paradoxical memory color for faces** Rosa Lafer-Sousa, Maryam Hasantash, Arash Afraz, Bevil R Conway

43.458 **Task-dependent biases in a delayed color matching paradigm** Maria Olkkonen, Toni P Saarela

43.459 Noncategorical color perception in multiple object tracking Mengdan Sun, Xuemin Zhang

43.460 Effect of imagining another culture on color preference Erika Kumakura, Annette Werner, Kazuhiko Yokosawa

43.461 **Color statistics underlying preference judgement for art paintings** Shigeki Nakauchi, Taisei Kondo, Hiroshi Higashi, João M.M. Linhares, Sérgio M.C. Nascimento

43.462 Naturalness and aesthetics of colors in the human brain Sérgio M Nascimento, Anke Marit Albers, Karl R Gegenfurtner

43.463 **Color categories in aesthetic preferences for paintings** Anke Marit Albers, Florian Schiller, Karl R. Gegenfurtner, Sérgio M.C. Nascimento

43.464 The neural substrate for semantic associations underlies color preference judgments Chris Racey, Ruyuan Zhang, Kendrick Kay, Karen B. Schloss

43.465 Human V4 Activity Patterns Predict Behavioral Performance in Imagery of Object Color Michael M Bannert, Andreas Bartels

43.466 Identifying multivariate patterns for illusory color perception using decoded fMRI neurofeedback JD Knotts, Aurelio Cortese, Mitsuo Kawato, Hakwan Lau

### Eye Movements: Pupil and melanopsin

Monday, May 21, 8:30 am - 12:30 pm, Pavilion

43.467 Longitudinal study of relationships between psychomotor vigilance, tonic and phasic pupil responses, and natural sleep history across 16 weeks Steven M Thurman, Nick Wasylyshyn, Javier O Garcia, Gold Okafor, James Elliott, Barry Giesbrecht, Scott Grafton, Erin Flynn-Evans, Jean M Vettel

43.468 Association between pupil constriction and aesthetic preference/naturalness in art-paintings Yuma Taniyama, Yuta Suzuki, Taisei Kondo, Tetsuto Minami, Shigeki Nakauchi

43.469 The effect of changes in screen luminance and lighting on pupillary response during web-surfing Evgeni Shelepin, Katerina Malakhova

43.470 **The differential effect of glowing appearance in the glare illusion: evidence from pupillometry** Yuta Suzuki, Tetsuto Minami, Bruno Laeng, Shigeki Nakauchi

43.471 Does the spectral sensitivity of melanopsin in ipRGCs suggest a role in chromatic adaptation? Daniel Garside, Lindsay MacDonald, Kees Teunissen

43.472 The population mean pupil response to melanopsin stimulation is reliable across sessions and background light levels Harrison M McAdams, Aleksandra Igdalova, Manuel Spitschan, David H Brainard, Geoffrey K Aguirre

43.473 **Binocular Summation in the Melanopsin Pathway in Visually Normal Observers** Marija Zivcevska, Al Blakeman, Shaobo Lei, Xingqiao Chen, Herbert C. Goltz, Agnes M.F. Wong

43.474 Effect of background melanopsin activation levels on contrast sensitivity mediated by postreceptoral pathways Michael R Tan, Clemente Paz-Filgueira, Pablo Barrionuevo,

Dingcai Cao

# Tuesday Morning Talks

### Visual Memory: Encoding and recall

Tuesday, May 22, 8:15 - 9:45 am, Talk Room 1 Moderator: Stefanie Becker

*51.11, 8:15 am* **Stimuli are encoded relationally, not independently in visual short-term memory** Aimee Martin, Stefanie I Becker

51.12, 8:30 am Preexisting spatial biases influence the encoding of information into visual working memory Colin Quirk, Kirsten Adam, Edward Vogel

51.13, 8:45 am The Effects of Prior Stimulus Familiarity on Visual Working Memory Maintenance and Retrieval Weiwei Zhang, WeiZhen Xie

*51.14, 9:00 am* Visual recall memory contains highly detailed and precise object and spatial information Wilma A Bainbridge, Elizabeth H Hall, Chris I Baker

*51.15, 9:15 am* **Neural Tuning Curves in Visual Working Memory** Chunyue Teng, Dwight J. Kravitz

*51.16, 9:30 am* Swap Errors in Spatial Working Memory are Informed Guesses, Not Binding Errors Michael S Pratte

### Attention: Spatial modulation

Tuesday, May 22, 10:45 am - 12:30 pm, Talk Room 1 Moderator: Martina Poletti

52.11, 10:45 am Measuring presaccadic attention without distorting it: A novel dynamic noise paradigm to investigate visuospatial attention Nina M Hanning, Heiner Deubel

*52.12, 11:00 am* **Attention and eye movements at the foveal scale** Martina Poletti

52.13, 11:15 am Adaptation of Visuospatial Attention Andrew I Wilson, Michael S A Graziano

52.14, 11:30 am The Neglected Contribution of Memory Encoding in Spatial Cueing effects: A New Theory of Costs and Benefits Brad Wyble, Hui Chen

52.15, 11:45 am Prismatic adaptation modulates inter-hemispheric balance with a subsequent change in visual field coverage Selene Schintu, Edward H. Silson, Zaynah M. Alam, Eric M. Wassermann, Sarah Shomstein

52.16, 12:00 pm Emergence of visuospatial attention in a brain-inspired deep neural network Gregory J. Zelinsky, Hossein Adeli

52.17, 12:15 pm Unimpaired habit-guided spatial attention in patients with Parkinson's disease Caitlin Sisk, Emily Twedell, Wilma Koutstaal, Scott E Cooper, Yuhong V Jiang



### Color and Light: Higher level

Tuesday, May 22, 8:15 - 9:45 am, Talk Room 2 Moderator: Anya Hurlbert

*51.21, 8:15 am* Effects of illumination on the perceptual categorization of surface materials Farley Norman, James T. Todd

51.22, 8:30 am Distinguishing Glossy from Matte Textured Materials Konrad E Prokott, Hideki Tamura, Roland W Fleming

51.23, 8:45 am Illusory transparency and optical blur induced by single shaded surfaces Scott W.J. Mooney, Barton L. Anderson

51.24, 9:00 am Reconstructing subjective color experiences across the human visual hierarchy Insub Kim, Sang Wook Hong, Steven K. Shevell, Won Mok Shim

51.25, 9:15 am **#TheShoe is the new #TheDress - a colour ambiguity involving the red-green axis needs a new explanation** Annette Werner, Sabrina Fuchs, Ylva Kersten, Martha Salinas

*51.26, 9:30 am* Finding the right light in the face of colour inconstancy: paintings and preferences Anya C Hurlbert, Naomi Gross, Gaurav Gupta

### **Object Recognition: Neural networks**

Tuesday, May 22, 10:45 am - 12:30 pm, Talk Room 2 Moderator: Philip Kellman

52.21, 10:45 am Comparing perception in deep neural networks and humans Georgin Jacob, RT Pramod, Harish Katti, SP Arun

52.22, 11:00 am **Population receptive fields in high-level visual cortex are tuned for specific categories** Edward H Silson, Richard C Reynolds, Daniel Janini, Chris I Baker, Dwight J Kravitz

52.23, 11:15 am **Do Deep Neural Networks Suffer from Crowding?** Gemma Roig, Anna Volokitin, Tomaso Poggio

*52.24, 11:30 am* Can deep learning networks acquire the robustness of human recognition when faced with objects in visual noise? Hojin Jang, Frank Tong

52.25, 11:45 am Deep Convolutional Networks do not Make Classifications Based on Global Object Shape Nicholas Baker, Hongjing Lu, Gennady Erlikhman, Philip J Kellman

52.26, 12:00 pm Using multiple optimization tasks to improve deep neural network models of higher ventral cortex Chengxu Zhuang, Daniel L.K. Yamins

52.27, 12:15 pm The essential role of recurrent processing during object recognition under occlusion Karim Rajaei, Yalda Mohsenzadeh, Reza Ebrahimpour, Seyed Mahdi Khaligh Razavi



### Faces: Neural mechanisms 1

Tuesday, May 22, 8:30 am - 12:30 pm, Banyan Breezeway

53.301 Isolating rapid and automatic human facial expression categorization Fanny Poncet, Milena P Dzhelyova, Jean-Yves Baudouin, Bruno Rossion, Arnaud Leleu

53.302 An objective signature of emotional expressions and context integration within a single glance: evidence from electroencephalographic frequency-tagging Stéphanie Matt, Joan Liu-Shuang, Louis Maillard, Joëlle Lighezzolo-Alnot, Bruno Rossion, Stéphanie Caharel

53.303 **N170 sensitivity to the horizontal information of facial expressions** Justin Duncan, Frédéric Gosselin, Caroline Blais, Daniel Fiset

53.304 Cortical activation of fearful faces requires central resources: multitasking processing deficits revealed by event-related potentials Amélie Roberge, Justin Duncan, Ulysse Fortier-Gauthier, Daniel Fiset, Benoit Brisson

53.305 Nasal Oxytocin produces emotion dependent effects on early visual evoked potentials. David P Crewther, Laila Hugrass, Ariane Price, Izelle Labuschagne

53.306 Sustained attention for categorical decision of uncanny faces as marked by delayed latency of P3 component Daegyu Kim, Hyeri Moon, Minkyu Hwang, Phil-sik Jang, Woo Hyun Jung, Joo-seok Hyun

53.307 Decoding facial expressions across non-overlapping face features in early visual cortex Fraser W Smith, Lucy S Petro, Lars Muckli, Vicky S Adams

53.308 Emotion-specific categorization-relevant information reconstructed from Right and Left Fusiform Gyri Nicola van Rijsbergen, Robin A.A. Ince, Philippe G. Schyns

53.309 Neural mechanisms of perceptual confusion of facial emotions Yingying Wang, Fang Fang

53.310 Decoding dynamic facial expressions in both macaque and human hui zhang, Shruti Japee, Leslie G. Ungerleider

### **Faces: Disorders**

Tuesday, May 22, 8:30 am - 12:30 pm, Banyan Breezeway

53.311 An updated cortical face network analysis of the prosopagnosic patient PS with fast periodic stimulation Xiaoqing Gao, Quoc Vuong, Bruno Rossion

53.312 **Developmental prosopagnosics have widespread selectivity reductions in category-selective areas** Jiahui Guo, Hua Yang, Brad Duchaine

53.313 Varieties of holistic processing deficits in developmental prosopagnosia Angus Chapman, Lauren Bell, Brad Duchaine, Tirta Susilo

53.314 Facial identity and facial expression processing dissociate in developmental prosopagnosia Lauren C Bell, Tirta Susilo

53.315 The scan-paths of acquired and developmental prosopagnosic subjects during a face memorization task Dong-Ho Lee, Sherryse Corrow, Jason JS Barton

53.316 Neural origins of cuteness perception and caregiving motivation: evidence from developmental and acquired prosopagnosia Edwin J Burns, Ebony Murray, Rachel Bennetts, Sarah Bate, Alice HD Chan, Hong Xu

# Tuesday Morning Posters

53.317 Reduced Perceptual Narrowing in Autism: Evidence from the Other-Race Face Effects Sivan Schwartz, Batsheva Hadad

53.378 Higher levels of autistic traits are linked to poorer face recognition performance but not reduced adaptive coding in 6-8 year-old children Linda R Jeffery, Kate Crookes, Ellen Bothe, Marianne Thorburn, Natalie Kaiko, Chloe Giffard, Romina Palermo

53.319 Effect of the noxious stimuli used on empathy-related activations in people with and without Autism Spectrum Disorder (ASD) Amandine Lassalle, Nicole R Zürcher, Loyse Hippolyte, Eva Billstedt, Carlo A Porro, Francesca Benuzzi, Patricia Solomon, Kenneth M Prkachin, Eric Lemonnier, Christopher Gillberg, Jakob A Johnels, Nouchine Hadjikhani

53.320 Individuals with Autism Spectrum Disorder utilize local viewing strategies for facial identity discrimination: an eye tracking study Kirsty Ainsworth, Domenico Tullo, Massimo Pietracupa, Jacalyn Guy, Armando Bertone

53.321 Reduced sensitivity to static and dynamic eye gaze cues in adolescents with autism Jason W Griffin, K. Suzanne Scherf

53.322 **Coarse information drives confusion of perceived emotion in schizophrenia** Simon Faghel-Soubeyrand, Tania Lecomte, Antoine Pennou, Frédéric Gosselin

53.324 Visual agnosic people don't optimize the use of relevant piecemeal information when they see new faces Ela I Olivares, Ana S Urraca, Jaime Iglesias

53.325 **Investigating the recognition of static and dynamic facial expressions of emotion in MCI patients** Anne-Raphaelle Richoz, Junpeng Lao, Martino Ceroni, Leonardo Sacco, Riccardo Pignatti, Roberto Caldara

53.326 Are you looking at me? The effects of hemianopia on perception of mutual gaze Alex R Bowers, Sarah S Sheldon, Heiko Hecht

### Faces: Individual differences

Tuesday, May 22, 8:30 am - 12:30 pm, Banyan Breezeway

53.327 Assessing the reliability of neural face discrimination with fast periodic visual stimulation Lisa Stacchi, Meike Ramon, Joan Liu-Shuang, Roberto Caldara

53.328 Individual differences in face identification correlate with face detection ability Virginie Burns, Guillaume Lalonde-Beaudoin, Justin Duncan, Stéphanie Bouchard, Caroline Blais, Daniel Fiset

53.329 The relation between facial recognition response time and facial recognition ability: task demands modulate its direction and magnitude Joseph Arizpe, Elyana Saad, Jeremy B Wilmer, Joe M DeGutis

53.330 **Task-specific extraction of horizontal information in faces** Gabrielle Dugas, Jessica Royer, Justin Duncan, Caroline Blais, Daniel Fiset

53.337 Matching Depth-Rotated Faces at Varying Degrees of Physical Similarity Tianyi Zhu, Miles Nelken, Catrina M. Hacker, Emily X. Meschke, Irving Biederman

53.332 Still Rough Around the Edges – Effects of Age and Individual Differences on Neural Network Organization in Young Adults Daniel Elbich, Suzy Scherf

53.333 How holistic processing of faces relates to cognitive control and intelligence Isabel Gauthier, Kao-Wei Chua, Jennifer J Richler

53.334 I Can Read You Like a Book: Expression Recognition is Positively Correlated with the Fantasy Empathy Subscale. Cindy Bukach, Rebecca Nguyen, Tessa Rinnen, Pascaline Munezero, Peter Kade, Ana Deutsch

53.335 The relationship between one's own interoceptive abilities and recognition of others' non-emotional internal state Rebecca Brewer, Jennifer McBride

53.336 Size doesn't matter. It's the quality of people's social networks that predicts individual differences in face recognition ability. Laura M Engfors, Romina Palermo, Linda Jeffery

53.337 Eye Movements During Face Viewing Predict Individual Differences in Noisy Audiovisual Speech Perception Johannes Rennig, Kira Wegner-Clemens, Micael S Beuachamp

### Binocular Vision: Rivalry and suppression

Tuesday, May 22, 8:30 am - 12:30 pm, Banyan Breezeway

53.338 Visual plasticity induced by short-term monocular deprivation recovers without visual input Seung Hyun Min, Alex S Baldwin, Robert F Hess

53.339 Comparison of Vergence and Accommodation Responses of Strabismic and Non-strabismic hyperopic, and emmetropic children Sonisha Neupane, Yifei Wu, Vidhyapriya Sreenivasan, Don W Lyon, Katie S Connolly, T. Rowan Candy

53.340 Assessing the generalizability of eye dominance across binocular rivalry, onset rivalry, and continuous flash suppression Yun Ding, Marnix Naber, Surya Gayet, Stefan Van der Stigchel, Chris Paffen

53.341 A model of the development of anisometropic amblyopia through recruitment of interocular suppression Samuel Eckmann, Lukas Klimmasch, Bertram Shi, Jochen Triesch

53.342 Get real: Suppressing the real world from awareness using augmented reality goggles Uri Korisky, Liad Mudrik

53.343 Ocular dominance plasticity in obese subjects can be restored by weight loss Claudia Lunghi, Giuseppe Daniele, Paola Binda, Angela Dardano, Annamaria Ciccarone, Santini Ferruccio, Giovanni Ceccarini, Laura Giusti, Stefano Del Prato, Maria Concetta Morrone

53.344 Conservative Criterion Explains The Non-Conscious Perception of Facial Expression Under Continuous Flash Suppression Ali Pournaghdali, Bennett L. Schwartz

53.346 Dealing with dynamic masks: Interocular image similarity delays access to awareness during continuous flash suppression Sjoerd Stuit, Stefan Van der Stigchel

53.347 Tilt illusion affected from invisible surroundings in binocular rivalry; Can interocular grouping occur without awareness? Yeonghun Seon, Woo Hyun Jung

53.348 Visual awareness requires the integration of higher-level brain regions with the stimulus-selective regions Tian Xue, Xu Shan, Chen Chen, Hu Si Yuan, Song Yi Ying, Liu Jia

53.349 **The Processing Status of Binocular Rivalry without Attention** Stella C Qian, Jan W Brascamp

53.350 Sequence learning causes perceptual suppression of expected stimuli Elizabeth A Lawler, Michael A Silver

53.351 Auditory cues for gender modulate attention in a binocular rivalry paradigm Jennifer A Day, Brent Hickey, Jeremy Saal, Nicolas Davidenko

53.352 Vestibular signals modulate perceptual alternations in binocular rivalry from motion conflict Chris Paffen, Robert Keys, Hamish MacDougall, David Alais, Frans AJ Verstraten 53.353 Binocular Color Grouping of Different Spatial Patterns Andrew J Coia, Emily A Slezak, Steven K Shevell

53.354 Idiosyncratic preferences in motion transparency and binocular rivalry are dissociable Byung-Woo Hwang, Alexander C. Schütz

53.355 **BOLD signal modulated with perception in the superficial layer of human V1 during binocular rivalry** Chencan Qian, Chengwen Liu, Jinyou Zou, Yan Zhuo, Sheng He, Peng Zhang

53.356 Causal Push-and-Pull Modulation of Binocular Rivalry Dynamics using GABAergic Drugs Jeff Mentch, Alina Spiegel, Catherine Ricciardi, Nancy Kanwisher, Caroline E. Robertson

53.357 Neural representations of orientation and motion direction in human visual cortex during binocular rivalry Junshi Lu, Chao Shi, Fang Fang

53.358 Interocular interaction for second-order stimuli depends on interocular noise correlation and eye dominance Jian Ding, Dennis M Levi

53.359 Dis-continuous flash suppression: A novel masking technique reveals temporal integration of subliminal linguistic information Shao-Min (Sean) Hung, Po-Jang (Brown) Hsieh

53.360 Low-level properties of dynamic Mondrians, not their predictability, empower continuous flash suppression Shui'Er Han, David Alais, Randolph Blake

### **Temporal Processing: Neural mechanisms**

Tuesday, May 22, 8:30 am - 12:30 pm, Banyan Breezeway

53.362 **The spatial representation of time in visual cortex** Gianfranco Fortunato, Tatiana Kénel-Pierre, Micah Murray, Domenica Bueti

53.363 A fronto-parietal network of visual event duration-tuned topographic maps Ben M Harvey, Serge O Dumoulin, Alessio Fracasso

53.364 **Chronotopic maps in human premotor cortex** Foteini Protopapa, Masamichi J Hayashi, Wietske van der Zwaag, Giovanni Battistella, Micah M Murray, Ryota Kanai, Domenica Bueti

53.365 **Theta-cyclic binding of visual features** Ryohei Nakayama, Isamu Motoyoshi

53.366 **MEG and fMRI dynamics during movie viewing** Kaisu Lankinen, Jukka Saari, Yevhen Hlushchuk, Pia Tikka, Lauri Parkkonen, Riitta Hari, Miika Koskinen

53.367 **Repetitive Stimulation Enhances V1 Encoding Efficiency** Jacob A Westerberg, Michele A Cox, Kacie Dougherty, Alexander Maier

53.368 Larger time dilation induced by 10-Hz flicker is associated with larger 10-Hz neural entrainments Hiroshi Yoshimatsu, Yuki Hashimoto, Yuko Yotsumoto

53.369 **Cholinergic dysfunction might affect backward masking performance: evidence from schizophrenia** Janir R da Cruz, Maya Roinishvili, Eka Chkonia, Patrícia Figueiredo, Michael H Herzog

# Attention: Neural mechanisms and attentional modulation

Tuesday, May 22, 8:30 am - 12:30 pm, Pavilion

53.401 **Testing the Link Between Feature-Selective Attention and Choice-Probabilities in Primate V2** Katrina R Quinn, Stephane Clery, Paria Pourriahi, Hendrikje Nienborg

Tuesday AM

53.403 Feature-based attention causes a ring-like modulation of motion direction tuning curves in areas MT and MST of macaques Sang-Ah Yoo, Julio Martinez-Trujillo , Stefan Treue, John K Tsotsos, Mazyar Fallah

53.404 The Impact of Self-Relevance and Valence on Word Processing: an ERP study Anna Hudson, McLennon J.G. Wilson, Emma S. Green, Roxane J. Itier, Henderson A. Henderson

53.405 Data-driven region-of-interest selection for visual and attention ERP studies controls Type I error and increases power Joseph L Brooks, Alexia Zoumpoulaki, Howard Bowman

53.406 Variability in Visuocortical Activation Biases Semantic Decisions Alexandra Theodorou, Emily Benny, Olivia Krieger , Jesse Bengson

53.407 The PR: An ERP index of the reactivation of spatially-specific memories Hayley EP Lagroix, Taylor Cork, Nadja Jankovic, Elijah Mudryk, Aaron Richardson, Kristen Thompson, Vincent Di Lollo, Thomas Spalek

53.408 Comparing the neural dynamics of voluntary feature-based and spatial attention Mehdi Yazid Senoussi, Niko A. Busch, Laurie Galas, Laura Dugué

53.409 Neural Markers of Switch-Cost Predict Cognitive Demand Avoidance. Jeffrey D Nador, Ion Juvina, Brad Minnery, Assaf Harel

53.410 **The Role of Bottom-Up Visual Representations in Emo-tional Decision-Making** Stephen J Phillips, Olivia R Krieger, Alexandra Theodorou, Jesse J Bengson

53.411 Alpha power, working memory (WM) and Attention Deficit Hyperactivity Disorder (ADHD) symptoms among children with ADHD Shira Frances-Israeli, Inbar L Trinczer, Shlomit Greenberg-Yuval, Roy Amit, Noa Rotman, Lilach Shalev

53.412 The role of pre-stimulus alpha oscillation in distractor filtering during a Visual Search task Aleksandra Pastuszak, Kimron L Shapiro, Simon Hanslmayr

53.413 **Age-mediated parietal contribution to salience suppresion** Carmel Mevorach, Brandon K Ashinoff, Stephen D Mayhew

53.414 Frontoparietal cortex encodes task set only when it is **needed** Shinyoung Jung, Suk Won Han\*

53.415 Dissociating proactive from reactive control in multiple-target visual search Eduard Ort, Johannes J. Fahrenfort, Michael Hanke, Falko Kaule, Reshanne Reeder, Stefan Pollmann, Christian N. L. Olivers

53.416 Change Blindness: Is V1 change blind ? Akhil Edadan, Wietske Zuiderbaan, Alessio Fracasso, Serge O Dumoulin

53.417 **How Top-down Attention Alters Bottom-up preconscious operations** Peter U Tse, Peter J Kohler, Eric A Reavis, LiWei Sun, Kevin Hartstein, Gideon Caplovitz

53.418 Continuous theta burst TMS of area MT impairs attentive motion tracking Tiffany T Tran, Arijit Chakraborty, Deborah Giaschi, Benjamin Thompson

53.419 Long-Term Functional Connectivity Changes Across The Dorsal Attention Network After Transcranial Electrical Stimulation Federica Contò, Grace Edwards, Lorella Battelli

### **Binocular Vision: Stereopsis**

Tuesday, May 22, 8:30 am - 12:30 pm, Pavilion

53.420 Perceptual adaptation to disparity is not well explained by responses in V1 Paul L Aparicio, Bruce G. Cumming 53.421 The effect of edge separation and orientation on the perception of depth in anti-correlated random dot stereograms Jordi M Asher, Paul B Hibbard

53.422 The spatial frequency effect on perceived depth from disparity Pei-Yin Chen, Chien-Chung Chen

53.423 Adaptive spatial re-weighting in stereoscopic depth perception revealed by disparity reverse correlation Takahiro Doi, Johannes Burge

53.424 Why is horizontal disparity important for stereo depth? Bart Farell, Cherlyn J. Ng

53.425 **Behavioural sensitivities to disparity-defined faces** Idy Wing-yi Chou, Dorita H.F Chang

53.426 Human binocular disparity estimation with natural stereo-images David N White, Johannes Burge

53.427 **The effects of object plausibility on disparity perception** Nicole Wong, Dorita H.F. Chang

53.428 Vergence adaptation in hyperopic children with and without a strabismic history Yifei Wu, Sonisha Neupane, Vidhyapriya Sreenivasan, Don W. Lyon, Katie S. Connolly, T. Rowan Candy

53.429 Stereo perimetry reveals peripheral loci mediating coarse stereopsis in macular degeneration Preeti Verghese, Saeideh Ghahghaei

53.430 The role of binocularly asymmetric peripheral field loss in abnormal binocular function in glaucoma Marguerite M Devereux, Rong Liu, MiYoung Kwon

53.431 Effects of short-term monocular deprivation on response time Cherlyn J Ng, Bart Farell

53.432 Eye fatigue in Augmented Reality at different vergence distances Moqian Tian, Joshua A Hernandez, Rosemary Le, Stefano Baldassi

### Eye Movements: Saccade

Tuesday, May 22, 8:30 am - 12:30 pm, Pavilion

53.433 **Unifying the Quantification of Fixation Stability** Susana T.L. Chung, Mehmet N. Ağaoğlu, Arun K. Krishnan

53.434 Classical conditioning of saccadic latencies using gap and overlap paradigms Cécile Vullings, Laurent Madelain

53.435 **Temporal Precision of Directly Controlled Eye Movements** Jonathan P Batten, Tim J Smith

53.436 Saccadic temporal recalibration alters action and perception Brent Parsons, Dunia Giomo, Domenica Bueti

53.437 **The time-course of trans-saccadic integration** Emma E.M. Stewart, Alexander C Schütz

53.438 The effects of binocular instability and saccadic overshoot on the performance of educationally relevant tasks. Matthew H Schneps, Marc Pomplun, Pavlo Antonenko, Do Hyong Koh, Richard Lamb, Andreas Keil

53.439 Effects of visual and tactile distractors on eye and hand movement curvature Tom Nissens, Katja Fiehler

53.440 Where am eye? Subjective gaze moves continuously across space before saccade onset Meng Fei Ngan, Nina M Hanning, Heiner Deubel

53.441 **Pre-saccadic motion integration drives pursuit for saccades to motion apertures.** Sunwoo Kwon, Martin Rolfs, Jude Mitchell 53.442 Curvature of saccades to moving targets corrects for initial directional errors Alexander Goettker, Doris I Braun, Karl R Gegenfurtner

53.443 **Investigating eye movements in enumeration using saccade-terminated trials** Jacob M Paul, Robert A Reeve, Jason D Forte

53.444 **Frequency Content of Saccade Transients** Zhetuo Zhao, Naghmeh Mostofi, Jonathan D Victor, Michele Rucci

53.445 Fixating an imaginary foveal stimulus increases microsaccades Scott Watamaniuk, Jeremy Badler, Stephen Heinen

53.446 **The human saccadic adaptation field across time** Eef Joosten, Therese Collins

53.447 Memory-guided saccades to visual stimulus sequences: influence of set-size and spatiotemporal structure on recall accuracy Sharmini Atputharaj, David C Cappadocia, J. Douglas Crawford

53.448 Visual-motor transformation in the multiunit activity of the frontal eye fields (FEF) during the head-unrestrained gaze shifts in rhesus monkeys Vishal Bharmauria, Amirsaman Sajad, Xiaogang Yan, Hongying Wang, John Douglas Crawford

53.449 **Reading from right to left: oculomotor adaptations** Johan Chandra, André Krügel, Ralf Engbert

53.450 Reduced sensitivity to trial pacing in Parkinson's disease saccadic eye movements. Mark Harwood, Annabelle Blangero

### Attention: Tracking

Tuesday, May 22, 8:30 am - 12:30 pm, Pavilion

53.457 A capacity limit for the rapid parallel selection of multiple target objects Anna Grubert, Martin Eimer

53.452 Strategic Search for Camouflaged Targets: Training Type Impacts Oculomotor Behavior Joanna Lewis, Dawn Sarno, Ada Mishler, Alyssa Hess, Corey Bohil, Art Kramer, Mark Neider

53.453 Your hidden capacity revealed! The Multiple Object Awareness (MOA) paradigm. Chia-Chien Wu, Jeremy M Wolfe

53.454 Object size affects multiple object tracking performance (but not via frequency of close encounters) Shanmukha A Upadhyayula, Jonathan I Flombaum

53.455 Examining the benefits of training attention with Multiple Object-Tracking for individuals diagnosed with a neurodevelopmental condition: A cross-over, cognitive training study Domenico Tullo, Jocelyn Faubert, Armando Bertone

53.456 Attention to objects at different depths is affected by their layout in depth and the plane of fixation, but is unaffected by aging. Eugenie Roudaia, Maya Labrèche, Delphine Bernardin, Aarlenne Z Khan, Jocelyn Faubert

53.457 Eye Movements Indicate Implementation of Mental Simulation to Assess Future Object Movement Aarit Ahuja, David Sheinberg

53.458 Measuring the Effect of Event Boundaries on Visuospatial Attention During Event Perception Ryan V Ringer, Zachary Throneburg, Bretney Belvill, Amber Craig, Sarah Albert, Nicole Bartel, Anna Cook, Lester C. Loschky

#### Attention: Temporal

Tuesday, May 22, 8:30 am - 12:30 pm, Pavilion

53.459 **Temporal Dynamics of Visual Attention Allocation** Seonggyu Choe, Jongmin Moon, Oh-sang Kwon

53.460 **Temporal attention improves perception at foveal and parafoveal locations equally** Antonio Fernandez, Rachel N Denison, Marisa Carrasco 53.461 **Sustained spatial attention can affect feature fusion** Ilanit Hochmitz, Marc M Lauffs, Michael H Herzog, Yaffa Yeshurun

53.462 Get ready! Mental alertness enhances perceptual processing and visual awareness Mathieu Landry, Jason Da Silva Castanheira, Amir Raz

53.463 Temporal attention enhances vision by a combination of signal amplification and noise reduction Luis D Ramirez, Sam Ling

53.464 The Effects of Rhythmic Structures on Visual Attention Parameters Nir Shalev, Anna Christina Nobre

53.465 Microsaccades reveal the temporal dynamics of template and response preparation during visual search. Katya Olmos Solis, Anouk M van Loon, Sander A Los, Christian N.L. Olivers

53.466 Voluntary temporal attention affects the rate and timing of microsaccades Rachel Denison, Shlomit Yuval-Greenberg, Marisa Carrasco

53.467 Get more out of your data: Breaking down response time to improve its usefulness Michelle R Kramer, Dwight J Kravitz, Stephen R Mitroff

## Perception and Action: Walking, navigating, driving

Tuesday, May 22, 8:30 am - 12:30 pm, Pavilion

53.468 Testing models of speed control in 1D pedestrian following Jiuyang Bai, William H. Warren

53.469 Metric vs. Topological Models of Collective Motion in Human Crowds Trenton D Wirth, Gregory C Dachner, William H Warren

53.470 Comparing Simple-radius and Doughnut Models of Collective Crowd Motion William Warren, Gregory Dachner

53.471 A vision-based model of following in a human crowd Gregory C Dachner, William H Warren

53.472 **Optical Variables Influencing Barrier Avoidance** Brittany A. Baxter, William H. Warren

53.473 Individual Differences in Self-recognition from Body Movements Akila Kadambi, Hongjing Lu

53.474 Learning to Integrate Egocentric and Allocentric Information using a Goal-directed Reward Signal Arthur W Juliani, Margaret E Sereno

53.475 Models of navigation and pointing in non-metric environments Alexander A. Muryy, Andrew Glennerster

53.476 Steering a car to intercept a moving target: Can people learn a better interception solution? Huaiyong Zhao, Dominik Straub, Constantin A. Rothkopf

53.477 The effects of age and following a lead car on scanning for and detection of motorcycle hazards at intersections Steven W Savage, Lily Zhang, Garrett S Swan, Dora Pepo, Alex R Bowers

53.478 **The effects of simulated acuity and contrast sensitivity impairments on detection of pedestrian hazards** Garrett Swan, Maha Shahin, Jacqueline Albert, Joseph Herrmann, Alex Bowers

53.479 Optimal integration of heading specified by optic flow and target egocentric direction Wei Sun, Zhenyu Zhu, Jing Chen, Guangtao Zhai, Michael Landy, Li Li



### Perception and Action: Decisions

Tuesday, May 22, 2:30 - 4:15 pm, Talk Room 1 Moderator: Mike Landy

54.11, 2:30 pm **Modeling contextual flexibility in visual communication** Judith E Fan, Robert X.D. Hawkins, Mike Wu, Noah D Goodman

54.12, 2:45 pm Assessing the role of rewards and priors on confidence judgments Elon Gaffin-Cahn, Shannon M Locke, Nadia Hosseinizaveh, Pascal Mamassian, Michael S Landy

54.13, 3:00 pm Confidence predicts variability but not biases in perceptual decisions andrea bertana, Ruben S. van Bergen, Sam Ling, Janneke F.M. Jehee

54.14, 3:15 pm The influence of low-level stimulus characteristics on metacognitive efficiency Dobromir Rahnev, Ji Won Bang, Medha Shekhar

54.15, 3:30 pm Laws of concatenated perception: Vision goes for novelty, Decisions for perseverance David Pascucci, Giovanni Mancuso, Elisa Santandrea, Chiara Della Libera, Gijs Plomp, Leonardo Chelazzi

54.16, 3:45 pm Body positioning in realistic ball interception accounts for visuomotor idiosyncrasies Imogen Large, Jeroen Smeets, Eli Brenner, Tessa Dekker

54.17, 4:00 pm Expectations about low-level visual features influence late stages of cortical information processing Nuttida Rungratsameetaweeman, Sirawaj Itthipuripat, Annalisa Salazar, John T. Serences

# Tuesday Afternoon Talks

### Perceptual Organization

Tuesday, May 22, 2:30 - 4:15 pm, Talk Room 2 Moderator: Elisha Merriam

54.21, 2:30 pm Stimulus vignetting and orientation selectivity in human visual cortex Zvi N Roth, David J Heeger, Elisha P Merriam

54.22, 2:45 pm Representation and remapping of occluded objects in the activity of V4 Rudiger von der Heydt, Shude D Zhu

54.23, 3:00 pm Shape scission: causal segmentation of shape Filipp Schmidt, Flip Phillips, Roland W. Fleming

54.24, 3:15 pm Curious objects: Preattentive processing of object complexity Zekun Sun, Chaz Firestone

54.25, 3:30 pm **A New Class of Motion Induced Illusory Contours** Barton L Anderson, Kairen Tan, Phillip J Marlow

54.26, 3:45 pm Representational dynamics of perceptual mean of sequentially presented objects varies with sequence variability Jongrok Do, Kang Yong Eo, Oliver James, Sangkyu Son, Joonyeol Lee, Yee-Joon Kim

54.27, 4:00 pm Electrophysiological Footprints of Grouping by Synchrony Benay Başkurt, Aaron M Clarke

### Motion

Tuesday, May 22, 5:15 - 7:15 pm, Talk Room 1 Moderator: John Perrone

55.11, 5:15 pm Visual motion statistics during real-world locomotion Karl Muller, Jonathan S Matthis, Kathryn Bonnen, Lawrence K Cormack, Mary M Hayhoe

55.12, 5:30 pm The computation of angular velocity and the perceived speed of a rotating line Kyle W Killebrew, Gideon P Caplovitz

55.13, 5:45 pm Defining and discriminating perceptual systems that extract the direction of visual motion. George Sperling, Peng Sun

55.14, 6:00 pm Noise, multisensory integration, and previous response in perceptual disambiguation Cesare V Parise, Marc O Ernst

55.15, 6:15 pm Characterizing late-developing binocular motion mechanisms in human visual cortex Peter J Kohler, Wesley Meredith, Anthony M Norcia

55.16, 6:30 pm Non-isotropic heading errors while moving along curved paths: Another reason to look where we are going? John A Perrone

55.17, 6:45 pm Multi-modal representation of visual and auditory motion directions in hMT+/V5 Mohamed Rezk, Stephanie Cattoir, Ceren Battal, Olivier Collignon

55.18, 7:00 pm Sensitivity to Sensory Cues Predicts Motion Sickness in Virtual Reality Jacqueline M Fulvio, Bas Rokers

### Perceptual Learning: Applied

Tuesday, May 22, 5:15 - 7:15 pm, Talk Room 2 Moderator: Krystel Huxlin

55.21, 5:15 pm Establishing a preferred retinal annulus (PRA): A new training paradigm to improve vision in patients with central scotoma Xinyu Xie, Lei Liu, Cong Yu

55.22, 5:30 pm Assessing the trial-by-trial time course of perceptual sensitivity change in perceptual learning using the quick Change Detection method zhang pan, Yukai Zhao, Barbara Dosher, Zhong-Lin Lu

55.23, 5:45 pm Visual Timing Sensitivity in a World Class Drum Corps Nestor Matthews, Leslie Welch, Elena Festa

55.24, 6:00 pm **Perceptual learning in police fingerprint detectives.** Parker J Banks, Ralph Gutoskie, Allison B Sekuler, Patrick J Bennett

55.25, 6:15 pm Using Eye Tracking to Develop Classification Images for Perceptual Learning Theodore Jacques, Aaron Seitz

55.26, 6:30 pm **Diminished contextual learning in autism spectrum disorders** Ari Rosenberg, Adhira Sunkara, Haorui Jiang, Ting-Yu Chang, Byounghoon Kim, Kailey Sabel, Sarah Jacquot, Ashley Dinges, Brittany Travers

55.27, 6:45 pm The Psychophysics of Algebra: Mathematics Perceptual Learning Interventions Produce Lasting Changes in the Perceptual Encoding of Mathematical Objects Philip J Kellman, Everett Mettler, Carolyn A. Bufford

55.28, 7:00 pm Visual recovery in chronic cortically-blind patients relies on spared cortical activity and increased V1 coverage of the blind field Antoine Barbot, Michael D. Melnick, Matthew R. Cavanaugh, Anasuya Das, Elisha P. Merriam, David J. Heeger, Krystel R. Huxlin


#### Faces: Neural mechanisms 2

Tuesday, May 22, 2:45 - 6:45 pm, Banyan Breezeway

56.301 Intracranial EEG recordings from face-selective temporal cortex show enhanced response to contralateral face information Brett B Bankson, Edward H Silson, Michael J Ward, R. Mark Richardson, Chris I Baker, Avniel S Ghuman

56.302 A comprehensive investigation of face recognition lateralisation in the posterior superior temporal sulcus. Magdalena W Sliwinska, David Pitcher

56.303 Holistic face processing and hemispheric competition during face recognition Matthew T Harrison, Lars Strother

56.304 fMRI gender classification of faces, bodies, and common names in the left occipitotemporal cortex Zhiheng Zhou, Lars Strother

56.305 FPVS reveals an upper visual field advantage for face categorization Genevieve L Quek, Bruno Rossion

56.306 Spatiotemporal dynamics of view-invariant face identity perception Joan Liu, Charles C.-F. Or, Bruno Rossion

56.307 Rapid decoding of face identity, familiarity, gender and age Katharina Dobs, Leyla Isik, Dimitrios Pantazis, Nancy Kanwisher

56.308 Multivariate classification of EEG data reveals spatial frequency dominance patterns during broad band image processing Kirsten Petras, Christianne Jacobs, Sanne Ten Oever, Valerie Goffaux

56.309 Predicting the location of macaque face patches with functional connectivity David E Osher, Josh Fuller-Deets, Bevil Conway

56.370 Functional connectivity of ventral temporal cortex reveals category-specificity in medial parietal areas Adam D Steel, Edward H Silson, Chris I Baker

*56.311* **Neural Correlates of Holistic Face Processing** Celia Foster, Mintao Zhao, Andreas Bartels, Isabelle Bülthoff

56.312 Repetitive TMS to right OFA enhances part-based but not holistic face encoding Elyana Saad, Joseph M. Arizpe, Michael Esterman, Joseph M. DeGutis

56.313 Is there a Bias to Encode Peer Faces in the FFA? Junqiang Dai, Suzy Scherf

56.314 An Investigation of Neural Mechanisms for Reversed Inversion Effect in Learning Faces Varying in Pose Gary C.W. Shyi, Peter K.-H. Cheng, Becky Y.-C. Chen, Tina S.-T. Huang, Alex Y.-C. Kuo, Yun Lee

56.315 The neural basis of face ensemble processing: An EEGbased investigation of facial identity summary statistics Tyler Roberts, Jonathan S Cant, Adrian Nestor

56.376 Putting the face and body back together: The neural representation of the whole person Libi Kliger, Galit Yovel

56.317 Differential responses across body- and face-selective cortex predict visual categorization behavior Mona Rosenke, Nicolas Davidenko, Kalanit Grill-Spector, Kevin S Weiner

# Tuesday Afternoon Posters

#### Faces: Familiarity and other-race effects

Tuesday, May 22, 2:45 - 6:45 pm, Banyan Breezeway

56.318 A neural index of rapid and automatic recognition of face familiarity Xiaoqian Yan, Bruno Rossion

56.319 **Face Familiarity in Deep Convolutional Neural Networks** Eilidh C Noyes, Y. Ivette Colon, Matthew Q Hill, Connor J Parde, Carlos D Castillo, Swami Sankaranarayanan, Alice J O'Toole

56.320 Comparing the perceptual separability of familiar and unfamiliar face dimensions S. Sanaz Hosseini, Fabian A. Soto

56.321 Implicit recognition of one's own and familiar faces Ilona Kotlewska, Matteo Visconti di Oleggio Castello, Anna Nowicka, Maria I. Gobbini

56.322 Analytical Match-Mismatch Detection with Holistically Processed Faces Mitchell A Meltzer, Anjali Nair, John P Quinonez, James C Bartlett

56.323 Decisional space modulates saccadic reaction times towards personally familiar faces in healthy observers and acquired prosopagnosia Meike Ramon, Nayla Sokhn, Junpeng Lao, Roberto Caldara

56.324 Ethnicity and gender effects in the perception of age in faces Seyed Morteza Mousavi, Mengqi Chen, Ipek Oruc

56.325 Does Observer's Ethnicity Affect Perceived Face Lightness? A Study of the Face-Lightness Distortion Effect for African American and Caucasian Observers Nikolay Nichiporuk, Kenneth Knoblauch, Clement Abbatecola, Steven K Shevell

56.326 Is there more to a pretty face than it being one's "ownrace"? Attractiveness ratings vary by skin tone, hair style, rater race and gender Cheryl M Newsome, Briana N Cutliff, Brandy Hudson, Katherine R Torres, Alexander J Bies

56.327 The interaction between self-face, own-gender and left field biases in chimeric faces Manuela Malaspina, Roberta Daini, Jason JS Barton

56.328 The big nose bias, or when distinctiveness hinders face learning: Evoking an other-race effect with selectively manipulated same-race faces Jürgen M Kaufmann, Sandro Vogt, Stefan R Schweinberger

56.329 **Preference for attractive faces is species-specific** Fabrice Damon, Zhihan Li, Yin Yan, Wu Li, Kun Guo, Paul C Quinn, Olivier Pascalis, David Méary

56.330 Cultural differences in spatial frequency utilisation do not generalize across various object classes Caroline Blais, Amanda Estéphan, Michael N'Guiamba N'Zie, Marie-Pier Plouffe-Demers, Ye Zhang, Dan Sun, Daniel Fiset

56.337 Examining cultural differences in naturalistic face scanning: A data-driven approach to analysing head-mounted eye-tracking data Jennifer X Haensel, Matthew Danvers, Mitsuhiko Ishikawa, Shoji Itakura, Tim J Smith, Atsushi Senju

56.332 Strategies for improving own-and other-race face recognition with learning context and multiple image training Jacqueline G Cavazos, Eilidh Noyes, Alice J O'Toole

56.333 Cross-Cultural and Cultural-Specific Visual Perception of Facial Expressions of Emotion in the Wild Ramprakash Srinivasan, Aleix M Martinez 56.334 The impact of culture on visual strategies underlying the judgment of facial expressions of pain. Camille Saumure, Marie-Pier Plouffe-Demers, Daniel Fiset, Stéphanie Cormier, Dan Sun, Zhang Ye, Miriam Kunz, Caroline Blais

56.335 **The impact of culture on the visual representation of pain facial expressions** Marie-Pier Plouffe Demers , Camille Saumure, Stéphanie Cormier, Daniel Fiset, Miriam Kunz, Dan Sun, Zhang Ye, Caroline Blais

#### Attention: Inattention and attentional blink

Tuesday, May 22, 2:45 - 6:45 pm, Banyan Breezeway

56.336 **Do we understand the paradoxical effect of attention on visual adaptation?** Jan Brascamp, Cheng Stella Qian, Alexis Mareschi

56.337 Perceptual similarity and working memory load in visual search for multiple targets Elena S Gorbunova, Kirill S Kozlov

56.338 The attentional blink and repetition blindness redux: Testing the perceptual wink model Lucas Huszar, David E Huber

56.339 **Confidence blinks before attention** Samuel Recht, Pascal Mamassian, Vincent de Gardelle

56.340 iBlindness: Restoring Situational Awareness to Pedestrians Using Smartphones Joshua James New, Nechama Kaiser

56.341 Kanizsa-figure object completion determines attentional selection in time: Evidence from the attentional blink Markus Conci, Qi-Yang Nie, Hermann J. Müller, Siyi Chen

56.342 Expectation Blindness: Seeing a face when there is none. Muge Erol, Arien Mack, Jason Clarke

56.343 **The Power of Hypnosis to Reduce the Attentional Blink.** Oksana Freedman, Arien Mack

56.344 Attenuation of Inattentional Blindness in Individuals who are HIV Positive Maegen Walker, Cecilia Shikuma, Scott Sinnett

#### Attention: Individual differences

Tuesday, May 22, 2:45 - 6:45 pm, Banyan Breezeway

56.345 Distinct correlates of perceptual capacity and working memory capacity in brain structure and behaviour Joshua O Eayrs, Nilli Lavie

56.346 Pupillometry as a window into the content and strength of attention sets Nelson A Roque, Walter R Boot

56.347 Enhanced visual attention in university hockey players Kait Clark, Michael Maddocks

56.348 Evidence for a broader allocation of attention in emmetropes over myopes during three visual processing tasks Amanda Estéphan, Carine Charbonneau, Hana Furumoto-Deshaies, Marie-Pier Plouffe-Demers, Daniel Fiset, Roberto Caldara, Caroline Blais

56.349 Heterogeneous cognitive profiles among children with Attention Deficit/Hyperactivity Disorder (ADHD) Inbar L Trinczer, Lilach Shalev

56.350 **Mental rotation performance in aphantasia** Zoe Pounder, Jane Jacob, Christianne Jacobs, Catherine Loveday, Tony Towell, Juha Silvanto

56.351 Autistic and positive schizotypal traits modulate cognitive control tendencies Ahmad Abu-Akel, Julie Ramain, Chrisitne Mohr

56.352 Approach motivation and narrowed attentional breadth following self-control: investigating the role of asymmetrical frontal activity Brent Pitchford, Karen M Arnell 56.353 **Exposure to acute psychosocial stress modulates the effect of cue validity in an attention orienting task.** Stuart M Pugh, Tamaryn Menneer, Dominic Taunton, Matt J Garner, Nick Donnelly

56.354 Instructor presence, working memory capacity and learning from instructional video Jiahui Wang, Palvo Antonenko , Ethan Fieldman, Ashley Fieldman

56.355 Motivated attention in the perception and action of climate change Jiaying Zhao, Yu Luo

56.356 **Transfer of Pseudoneglect in a Theory of Mind Task** Branden J Bio, Taylor W Webb, Michael SA Graziano

#### Multisensory Processing: Vision and audition

Tuesday, May 22, 2:45 - 6:45 pm, Banyan Breezeway

56.357 Both Intra- and Supra-Modal Time Perception Mechanisms Exist: Evidence from Debut Chronostasis Shinsuke Shimojo, Yong-Jun Lin, William Liang

56.358 Hand Dominance Can be Effectively Eliminated by Sensory Dominance during Multisensory Competition Shiyong Chen, You Li, Lu Shen, Jing Xia, Yizhou Jiang, Yuqian Yang, Qi Chen

56.359 Audiovisual combination with temporal correlation and time pressure Robert Sekuler, Yile Sun, Timothy J Hickey

56.360 **Complex interactions across modalities in audio-visual cross-modal statistical learning** Helga Reguly, Márton Nagy, József Fiser

56.361 Acquirement of cross-modal correspondence from mere experience Asumi Hayashi, Kazuhiko Yokosawa

56.362 Audiovisual Competition in the Line Motion Illusion Amanda J Sinclair, Aidan J Wickenhauser, Chamin D Wanasundara, Steven L Prime

56.363 **A common mechanism processes auditory and visual motion** David Alais, Uxía Fernández Folgueiras, Johahn Leung

56.364 Visual motion perception is influenced by sound pitch and location Prachi FNU, Steven L Prime

56.365 Does audible sound modulate the potency of visual motion when that motion is suppressed from awareness by continuous flash suppression? Minsun Park, Chai-Youn Kim

56.366 Beep, be-, or -ep: The impact of auditory transients on perceived bouncing/streaming. Hauke S Meyerhoff, Satoru Suzuki

56.367 Faces and voices in the brain: RSA reveals modality-general person-identity representations in the STS Maria S Tsantani, Nikolaus Kriegeskorte, Carolyn McGettigan, Lúcia Garrido

56.368 **Comprehension of an audio versus an audiovisual lecture at 50% time-compression** Nicole Perez, Michael J Kleiman, Elan Barenholtz

56.369 **The Contribution of Facial Motion to Voice Recognition** Noa Simhi, Itai Linzen, Galit Yovel

56.370 Weems vs Wums: Random Shapes with Distinct Edges and Fast Motion are More Often Classified as "Weems", and One's that are Blurry and Slow as "Wums" Michael K. McBeath, R. Chandler Krynen, K. Jacob Patten, Seth D. Gory

56.371 An Electroencephalography Investigation of the Differential Effects of Visual versus Auditory Attention on Crossmodal Temporal Acuity Leslie D Kwakye, Kathryn K Hirabayashi, Zoii Barnes-Scott, Samantha L Papadakis

56.372 Does a salient auditory stimulus always impair visual memory? Keiji Konishi, Ryoichi Nakashima, Kazuhiko Yokosawa

#### 56.373 Cross-modal attenuation of misophonic

**responses** Patrawat Samermit, Jeremy Saal, John Collins, Nicolas Davidenko

#### **Object Recognition: Neural Mechanisms**

Tuesday, May 22, 2:45 - 6:45 pm, Pavilion

56.401 Is the use of visual predictions dependent on expected target difficulty? Sage EP Boettcher, Freek van Ede, Anna C Nobre

56.402 Electrophysiological Evidence for the Tripartite Organization of the Ventral Stream by Animacy and Object Size Joseph D Borders, Birken T Noesen, Assaf Harel

56.403 **Object Ambiguity Gates Access to Visual Awareness** Alisa M Braun, Timothy D Sweeny

56.404 **Neural Substrates of Ensemble Perception** Michael L Epstein, Tatiana A Emmanouil

56.405 Eccentricity drives developmental organization of human high-level visual cortex Jesse Gomez, Michael Barnett, Kalanit Grill-Spector

56.406 The Time Courses of Object Category and Location Representations in the Human Brain Depend on Clutter Monika Graumann, Caterina Ciuffi, Radoslaw M. Cichy

56.407 **The neural encoding of object hardness** Li Guo, Alissa Stafford, Susan Courtney, Jason Fischer

56.408 Using HD-EEG to Explore Spatiotemporal Representations of Object Categories in Visual Cortex Gennadiy Gurariy, Jacqueline C. Snow, Ryan E.B. Mruczek, Matthew R. Johnson, James Mardock, Gideon P. Caplovitz

56.409 Shape changes in global properties weaken the innate defensive responses to visual threats of mice Yan Huang, Lei Li, Kun Dong, Yundan Liao, Xianglian Jia, Hongsi Tang, Liping Wang

56.410 **Typical real-world locations facilitate object processing** Daniel Kaiser, Merle M Moeskops, Radoslaw M Cichy

56.411 **Serial Dependence on a Large Scale** Mauro Manassi, Yuki Murai, David Whitney

56.412 The effect of expertise upon behavioral and neural representational spaces Hans P Op de Beeck, Farah Martens

56.413 Using Neural Distance to Predict Reaction Time for Categorizing Animacy, Shape, and Abstract Properties J.Brendan W Ritchie, Hans P Op de Beeck

56.415 Visual Scenes Prime Associated Novel Objects as a Function of Prime-Target Delay, Temporal Expectancy, and Hemispheric Lateralization Cybelle M Smith, Kara D Federmeier

56.416 Transcranial direct current stimulation (tDCS) on the left dorsolateral prefrontal cortex (IDLPFC) selectively modulates our sense of beauty Kuri Takahashi, Yuko Yotsumoto

56.417 **Decoding face- and house-associated eye-movement patterns in FFA and PPA** Lihui Wang, Florian Baumgartner, Michael Hanke, Stefan Pollmann

56.418 Neural Representation of Spatial Layout and Relational Information among Multiple Objects Ruosi Wang, Yaoda Xu

#### **Object Recognition: Reading and other**

Tuesday, May 22, 2:45 - 6:45 pm, Pavilion

56.419 The fine-grained sub-millisecond objective and subjective psychophysics of stimulus representation Dalila Achoui, Axel Cleeremans 56.420 How does reading expertise influence letter representations in the brain? An fMRI study Aakash Agrawal, K.V.S. Hari, S. P. Arun

56.421 Visual word classification and image reconstruction from EEG-based time-domain and frequency-domain features Shouyu Ling, Andy C.H. Lee, Blair C. Armstrong, Adrian Nestor

56.422 Is the critical print size for reading linked to letter recognition? Steve Mansfield, Taylor R. West, Zierra Dean

56.423 **Test-Retest Reliability of the quick Reading method** Timothy G Shepard, Zhong-Lin Lu, Deyue Yu

56.424 Left-lateralized interference of letter recognition on mirror-invariant object recognition Lars Strother, Matthew T. Harrison

56.425 Visual and Motor Experiences of Handwriting Independently Contribute to Gains in Visual Recognition Sophia Vinci-Booher, Neha Sehgal, Karin James

56.426 Anterior Fusiform Naming Area: a Patch at the Anterior Tip of the Fusiform Causally Linked to Reading and Language Michael J Ward, Matthew Boring, Edward Silson, Mark Richardson, Chris Baker, Julie Fiez, Avniel Ghuman

56.427 **Probing the serial bottleneck in visual word recognition** Alex L White, John Palmer, Geoffrey M Boynton

56.428 Reading with Letter Transpositions in Central and Peripheral Vision Ying-Zi Xiong, Chenyue Qiao, Gordon E. Legge

56.429 **Letter recognition in different fonts** Deyue Yu, Emily Watson

56.430 **Visual hemifields are a bottleneck for awareness** Evan A Reierson, Timothy D Sweeny

56.431 **The Ebbinghaus illusion changes numerosity perception** Saki Takao, Katsumi Watanabe

56.432 Measuring face-name integration with fast periodic visual stimulation Angelique Volfart, Louis Maillard, Bruno Rossion

56.433 Shaping perception of individual objects through summary statistical perception Allison Yamanashi , Kristin Donnelly, David Whitney

56.434 Tracking two pleasures Aenne A Brielmann, Denis G Pelli

56.435 Detection of people in natural images can be done with as few as 9x13 samples Douglas A Addleman, Sha Li, Alexander Bratch, Daniel Kersten

#### Attention: Space

Tuesday, May 22, 2:45 - 6:45 pm, Pavilion

56.436 What does it mean to visually estimate: Re-understanding internal noise as internal confidence for time, space and number Justin Halberda

56.437 Temporal order dynamically modulates the interaction between ground suppression and top-down inhibition. Paige E Scalf, Adam S Richardson

56.438 Looking for something big: attentional capture by illusory object size in natural scenes Surya Gayet, Marius Peelen

56.439 Internal Attention Elicits Surround Suppression in Visuospatial Working Memory Wanghaoming Fang, Susan Ravizza, Taosheng Liu

56.440 Visual short-term memory load does not enhance attentional selection Hyuksu Lee, Do-Joon Yi

56.441 Learning-induced changes in attentional priority map are task-specific Sha Li, Roger R Remington, Yuhong V Jiang

56.442 Dissociating two forms of inhibition of return using temporal order judgments Ralph S. Redden, Austin J. Hurst, Raymond M. Klein

56.443 Cueing effects for simple detection are best accounted for by a decision model of selective attention Miranda Petty, John Palmer, Cathleen M Moore, Geoffrey M Boynton

56.444 Rethinking capacity limits in visual processing: Peripheral vision, attention, and decision limits Ruth Rosenholtz

56.445 Effect of background texture on target detection: masking or differential processing for near and far pictorial depth? Jiali Song, Hong-Jin Sun, Patrick J. Bennett, Allison B. Sekuler

56.446 Inhibition of return at different eccentricities in visual field under three-dimensional (3D) world Aijun Wang, Xiaole Liu, Ming Zhang

56.447 Dissociating attentional shifting and attentional engagement: behavioral and ERP evidence Alon Zivony, Ayala Allon, Roy Luria, Dominique Lamy

56.448 Late enhancement of visual attention after multi-method brain stimulation Grace CA Edwards, Federica Contò, Loryn Bucci, Lorella Battelli

56.449 The minimal size of the attentional window is larger when measured via the pupillary light response Shira Tkacz-Domb, Yaffa Yeshurun

56.450 Facilitation and inhibition in selective attention: Two sides of the same coin? Dirk van Moorselaar, Heleen A Slagter

56.451 The effects of attentional scope on voxel receptive fields and population codes for space Vy A Vo, John T Serences

56.452 Is Spatial Attention-Modulated Surround Suppression Observed Across Development? Audrey Wong-Kee-You, Scott A. Adler

#### Attention: Eye movements

Tuesday, May 22, 2:45 - 6:45 pm, Pavilion

56.453 Impact of Birth Experience on Adults' Selective Attention and Eye Movements Scott A Adler, Audrey M.B. Wong-Kee-You, Kyle J Comishen, Solomon Sabovich

56.454 The degree of gaze-induced shifts in overt attention explains inter-subject variability in long-term memory performance Touchai Thawai, Sakol Teeravarunyou, Geoffrey F Woodman, Sirawaj Itthipuripat

56.455 Attentional Repulsion Effect: the influence of response mode and microsaccades Denise Baumeler, Sabine Born

56.456 **An oculomotor contribution to the attentional blink** Dorothy L Ayres, Stephen Heinen, Scott Watamaniuk

56.457 **Attentional fingerprints: Individual differences in gaze behaviour** Ben de Haas, Alexios I Iakovidis, D. Samuel Schwarzkopf, Karl R Gegenfurtner

56.458 **The Wandering Eye: A novel method for the objective measurement of mind wandering in real time** Geoffrey W Harrison, Eden Shaul, Philip Aucoin, Jordan Poppenk, Daryl E Wilson

56.459 Dissociating spatial orienting biases from selection demands with eye movements Matthew D Hilchey, Mark Mills, Jay Pratt

56.460 Attention operates in saccade coordinates, not perceptual coordinates Sirui Liu, Kevin Hartstein, Peter Ulric Tse, Patrick Cavanagh

56.461 Oculomotor behavior during non-visual tasks: the role of visual saliency Dekel Abeles, Roy Amit, Shlomit Yuval-Greenberg

56.462 Visual Salience Model of Active Viewing in 360° Real-World Scenes Caroline E Robertson, Jefferey S Mentch, Nancy G Kanwisher

56.463 Fixation Patterns to Celebrities and Selfies following Image and Task Modification Tiffany Arango, Peter Bex

56.464 Reward-predicting stimuli accelerate contextual cueing and modulate eye movements Nils Bergmann, Dennis Koch, Anna Schubö

56.465 **Coarse and Fine Visual Attention Strategies during a 3D Mental Rotation Task** Stephanie M Saltzmann, Katherine C Moen, Leslie G Butler, Jagannathan Ramanujam, Alex S Cohen, Steve G Greening, Melissa R Beck

# Eye Movements: Attention, salience, search, reading

Tuesday, May 22, 2:45 - 6:45 pm, Pavilion

56.466 Including temporal information into prediction of gaze direction by webcam data Katerina Malakhova, Evgenii Shelepin

56.467 Flow of the eye: Gaze direction as an objective measure of flow experience Mohammad Shehata, Salma Elnagar, Shota Yasunaga, Shigeki Nakauchi, Shinsuke Shimojo

56.468 Characterizing the gain change underlying presaccadic attention Jasmine Pan, Hsin-Hung Li, Marisa Carrasco

56.469 **Exogenous Orienting of Peri-Saccadic Spatial Attention** Ilana Naveh, Yuval Porat, Ehud Zohary

56.470 Endogenous spatial and feature-based attention outside the saccadic range Gozde Senturk, Taosheng Liu

56.471 Saliency Map Classification Using Capsule-based CNNs Michael J Kleiman, William E Hahn, Elan Barenholtz

56.472 Human Saliency Prediction using Conditional Generative Adversarial Neural Networks William Hahn, Mark Lenson, Elan Barenholtz

56.473 **Predicting fixation densities over time from early visual processing** Heiko H Schütt, Lars O M Rothkegel, Hans A Trukenbrod, Ralf Engbert, Felix A Wichmann

56.474 Assessing the dynamic visual processing of informative local features with eye movements Anna Montagnini, Anna Paola Benini, Maria M. Del Viva

56.475 Effects of visual search target-distractor congruence on stimulus-response mapping in macaques: Performance strategies Kaleb A Lowe, Thomas R Reppert, Jeffrey D Schall

56.476 Effects of visual search target-distractor congruence on stimulus-response mapping in macaques: Saccade timing and vigor Thomas Reppert, Kaleb A Lowe, Jeffrey D Schall

56.477 Send Help! SOS Effects Arise in Proofreading, as Revealed by Eye Movements Eliza Barach, Heather Sheridan

56.478 Suppressing the Magnocellular Pathway in Skilled Readers: An Eye Movement Study Stephen J Agauas, Laura E Thomas

56.479 Eye movements reveal the visual component of music expertise: Evidence from a music-related visual search task Kinnera S Maturi, Heather Sheridan

56.480 Visual expertise in a music reading flicker paradigm: Evidence from eye movements Abigail L Kleinsmith, Heather Sheridan



#### Attention: Neural mechanisms

Wednesday, May 23, 8:15 - 10:00 am, Talk Room 1 Moderator: Yaoda Xu

61.11, 8:15 am Visual selective attention in mice Richard Krauzlis, Lupeng Wang

61.12, 8:30 am A node for hemi-spatial neglect in macaque temporal cortex Amarender R Bogadhi, Leor N Katz, Anil Bollimunta, Richard J Krauzlis

61.13, 8:45 am **The N2pc does not reflect a shift of covert spatial attention** Joshua J Foster, Emma M Bsales, Edward Awh

61.14, 9:00 am Theta-band oscillations track the time course of attentional suppression Tobias Feldmann-Wüstefeld, Edward Awh

61.15, 9:15 am The visual representation of templates for rejection Reshanne Reeder, Christian N. L. Olivers, Stefan Pollmann

61.16, 9:30 am Statistical learning shapes distractor suppression Jan Theeuwes, Benchi Wang, Joram van Driel, Cristian N.L. Olivers

61.17, 9:45 am **Probing mixed selectivity with fMRI voxel analysis** Yaoda Xu, JohnMark Taylor, Maryam Vaziri-Pashkam

#### Faces: Neural mechanisms

Wednesday, May 23, 11:00 am - 12:45 pm, Talk Room 1 Moderator: Daniel Baldauf

62.11, 11:00 am Amygdala damage eliminates monkeys' viewing preference for real and illusory faces. Jessica Taubert, Susan G Wardle, Molly Flessert, Benjamin M Basile, Elissa Koele, Clarissa James, Elisabeth A Murray, Leslie G Ungerleider

62.12, 11:15 am A face is more than just the eyes, nose, and mouth: fMRI evidence for the role of external face features in face recognition Frederik S Kamps, Ethan J Morris, Daniel D Dilks

62.13, 11:30 am Dissociating unfamiliar and familiar face discrimination processes over the course of natural familiarization Alison C. Campbell, James Tanaka

62.14, 11:45 am Distinct neural processes for the perception of familiar versus unfamiliar faces along the visual hierarchy revealed by frequency tagging Elliot Collins, Amanda Robinson, Marlene Behrmann

62.15, 12:00 pm Symmetrical Viewpoint Representations in Face-Responsive Regions of the Human Brain Convey an Advantage in Face Learning Tessa R Flack, Richard J Harris, Andrew W Young, Timothy J Andrews

62.16, 12:15 pm Top-down attention in the face-processing network: an MRI-guided MEG study using multiple simultaneous frequency tags Daniel Baldauf, Eelke de Vries

62.17, 12:30 pm Serial dependence fluctuates at alpha rhythms Yuki Murai, Mauro Manassi, Bill Prinzmetal, Kaoru Amano, David Whitney

# Wednesday Morning Talks

#### Multisensory

Wednesday, May 23, 8:15 - 10:00 am, Talk Room 2 Moderator: Loes van Dam

61.21, 8:15 am Tracking tactile braille brain responses in space and time Santani Teng, Radoslaw Cichy, Dimitrios Pantazis, Aude Oliva

61.22, 8:30 am Cross-modal Plasticity After Early Blindness Co-opts Persisting Visual Archetecture. Tristram Savage, Ione Fine, Fang Jiang

61.23, 8:45 am Humans Combine a New Auditory Cue to Distance with Vision After Less Than 3 Hours of Training Marko Nardini, James E Negen, Lisa Wen, Lore Thaler

61.24, 9:00 am The mapping and reconstruction of the brain's mind eye in the absence of visual experience: a population receptive field mapping of soundscape space Shir Hofstetter, Wietske Zuiderbaan, Serge Dumoulin, Amir Amedi

61.25, 9:15 am When visuomotor adaptation fails, 3D perception changes Evan Cesanek, Fulvio Domini

61.26, 9:30 am A common cause in the phenomenological and sensorimotor correlates of body ownership Majed J Samad, Cesare Parise, Sean Keller, Massimiliano Di Luca

61.27, 9:45 am Visual and tactile working memory stores have independent capacity limitations Tobias Katus, Martin Eimer

#### Scene Perception

Wednesday, May 23, 11:00 am - 12:45 pm, Talk Room 2 Moderator: Miguel Eckstein

62.21, 11:00 am The Parahippocampal Place Area is involved in scene categorization, not landmark recognition Andrew S Persichetti, Daniel D Dilks

62.22, 11:15 am The Foreground Bias: Initial scene representations dominated by foreground information Monica S. Castelhano, Suzette Fernandes

62.23, 11:30 am Scene content is predominantly conveyed by high spatial frequencies in scene-selective visual cortex Dirk B. Walther, Daniel Berman, Julie D. Golomb

62.24, 11:45 am Object cues facilitate the multivariate representations of scene layout in human fMRI and MEG Talia Brandman, Marius V. Peelen

62.25, 12:00 pm Neural representation of object-scene scale consistency Lauren E Welbourne, Barry Giesbrecht, Miguel P Eckstein

62.26, 12:15 pm Interpreting Visual Representations of Neural Networks via Network Dissection Bolei Zhou, David Bau, Aude Oliva, Antonio Torralba

62.27, 12:30 pm **BOLD tuning of human visual cortex to natural statistical properties in space and time** Zoey J Isherwood, Colin WG Clifford, Mark M Schira, Branka Spehar

# Wednesday Morning Posters

#### Attention: Reward, motivation, emotion

Wednesday, May 23, 8:30 am - 12:30 pm, Banyan Breezeway

63.307 Reward differentially interacts with physical salience in feature-based attention Mengyuan Gong, Taosheng Liu

63.302 Feature visibility is necessary in reward-based attentional capture Chisato Mine, Jun Saiki

63.303 Value associations combine additively with spatial cues to bias selective visual attention. Jane E Raymond, Kelly G Garner

63.304 Equating Selection History in a Value-driven Capture Paradigm: The Effects of Gains and Losses Mark W. Becker, Eric Chantland, Taosheng Liu

63.305 Reward induces the communication of task-specific visual information between the default mode and dorsal attention networks David Rothlein, Joseph DeGutis, Michael Esterman

63.306 The Impact of Performance-Based Pay and Competition on Rare Target Search Performance Eric C. M. Chantland, Mark W. Becker

63.307 Value-Driven Attentional Capture Under Threat of Shock Andy J Kim, Brian A Anderson

63.308 Neural Mechanisms of Attentional Bias Following Aversive Conditioning Haena Kim, Namrata Nanavaty, Vani A Mathur, Brian A Anderson

63.309 Motivational Trade-Offs Drive Attention Capture Daniel B Dodgson, Jane E Raymond

63.310 No competition between simultaneous task cues and threat cues in visual cortex Maeve R Boylan, Mia Kelly, Andreas Keil

63.311 Slimness Attracts Attention: How Body Weight Modulates Pseudoneglect Nicole A Thomas, Ellie Aniulis

#### Attention: Exogenous and endogenous

Wednesday, May 23, 8:30 am - 12:30 pm, Banyan Breezeway

63.313 **Endogenous Attention in Visually-Typical Children** Priyanka V Ramesh, Lynne Kiorpes

63.314 Associative learning accelerates the temporal dynamics of covert exogenous spatial attention Michael A Grubb, Devin Butler

63.315 Endogenous and exogenous covert attention differentially modulate second-order textures Michael Jigo, Marisa Carrasco

## 63.316 Neural processing of task-irrelevant but salient object: an MEG study Jianrong Jia, Fang Fang, Huan Luo

63.317 A widespread task-related hemodynamic response in human V1 is modulated by task difficulty Minyoung Ryoo, Charlie Burlingham, Zvi N Roth, David J Heeger, Elisha P Merriam

63.318 Involuntary orienting to visual and auditory stimuli elicits similar biasing mechanisms in early visual cortex to facilitate target processing Viola S Störmer, John J McDonald, Steven A Hillyard

63.319 A Rational Analysis Account of Voluntary Symbolic Attention Control Joseph R. Pauszek, Bradley S. Gibson

63.320 Metacognitive judgments and perceptual decisions rely on different information. Kyuin Kim, Sang Chul Chong



Wednesday, May 23, 8:30 am - 12:30 pm, Banyan Breezeway

63.321 **Tool identity and subsequent use affects the kinematics of grasping movements** Diana Tonin, Ralph Pawling, Katrina Leyden, Fraser W Smith, Stephanie Rossit

63.322 Luminance and surface texture discontinuities affect perception of object reachability in virtual reality. Jonathan K Doyon, Joseph D Clark, Tyler Surber, Alen Hajnal

63.323 Learning intermediate features of affordances with a convolutional neural network Aria Y Wang, Michael J Tarr

63.324 Affording Both: Do the Same Underlying Mechanisms Account for Action-specific and Affordance Perception? mike tymoski, Jessica Witt

63.325 Distancces Appear Farther on Hills: Evidence for Top-Down Effects Emily L Laitin, Michael J Tymoski, Nathan L Tenhunfeld, Jessica K Witt

63.326 Action-Specific Perception Depends on Relative Performance when Judging Speed via a Speed-Bisection Task and Absolute Performance when Judging Speed via a Magnitude Estimation Task Jessica K Witt

63.327 Failure is Not an Option: Testing the Effects of Automation Failure on the Perceptual System Nicholas J Fitzgerald, Nathan L Tenhundfeld, Jessica K Witt

63.328 Identifying blurry scenes with translational optic flow, rotational optic flow or combined optic flow Jing Samantha Pan, Hongyuan Wu

63.329 Similarities and differences in the representation of real objects and images: insights from inverse multidimensional scaling Desiree E Holler, Sara Fabbri, Jacqueline C Snow

63.330 Attenuated tilt illusion for real-world displays versus pictorial displays Michael A Gomez, Michael A Webster, Jacqueline C Snow

63.331 With this tilt, I dub you cute: Head tilt increases cuteness in puppies and adult dogs Muna Amry, Catrina H White, Derek K. McClellan, D. Alexander Varakin

#### Eye Movements: Perception and remapping

Wednesday, May 23, 8:30 am - 12:30 pm, Banyan Breezeway

63.332 Evoked responses to transient stimuli are associated with saccade reaction time Jonathan O Touryan, David Slayback, Anthony J Ries

63.333 Detecting motion-changes with peripheral vision: On the superiority of fixating over tracking. Christian Vater, Andre Klostermann, Ernst-Joachim Hossner

63.334 Perceptual enhancements during microsaccade preparation Natalya D Shelchkova, Michele Rucci, Martina Poletti

63.335 **Mapping visibility around the blind spot** Annegret Meermeier, Markus Lappe, Michele Rucci

63.336 **Eye Movements as Indicators of Scene Grammar Inconsistencies** Do Hyong Koh, Akram Bayat, Anubhkaw Kunar Nand, Marc Pomplun, Shaohua Jia

63.337 Fixation stability during global motion discrimination tasks Kimberly Meier, Deborah Giaschi, Miriam Spering

63.338 Binocular coordination when focussing on bright and dark objects Anke Huckauf

63.339 Learning to see through the saccadic veil Yuval Porat, Ehud Zohary

63.340 Distractor displacements during saccades are reflected in the time-course of saccade curvature Artem V Belopolsky, Jonathan van Leeuwen

63.347 From retinal to world-centered perception of intra-saccadic motion streaks: Evidence for high-fidelity eye position information during saccades Richard Schweitzer, Tamara Watson, Tarryn Balsdon, Martin Rolfs

63.342 Does the visual system's perceptual stabilization of small eye movements affect visual performance? Adela SY Park, Andrew B Metha, Phillip A Bedggood, Andrew J Anderson

63.343 Localizing visual targets across saccades: Do nontarget landmarks really help? Xiaoli Zhang, Julie D Golomb

63.344 A blanking effect for trans-saccadic colour changes Carolin Hübner, Alexander C. Schütz

63.345 **Transsaccadic integration is unaffected by saccade landing point** Stefan Van der Stigchel, Nathan Van der Stoep, Martijn Schut

63.346 Transsacadic Integration of Multiple Objects and The Influence of Stable Allocentric Cue George Tomou, Xiaogang Yan, J. Douglas Crawford

63.347 Trans-saccadic feature integration relies on luminance contrast Lukasz Grzeczkowski, Martin Szinte, Heiner Deubel

63.348 **Optimal integration of retinal and extra-retinal information is contingent upon trans-saccadic discontinuity** Avi M Aizenman, Dennis M Levi , Preeti Verghese, Sevda Agaoglu

63.349 Localization errors following saccadic adaptation to a dichoptic step Anna A Kosovicheva, Oishi Hawlader, Peter J Bex

#### Visual Memory: Change detection

Wednesday, May 23, 8:30 am - 12:30 pm, Pavilion

63.401 Pay attention to this, not that: Feature repetition prevents task-irrelevant feature processing Katherine C Moen, Sunghyun Kim, Rebecca R Goldstein, Melissa R Beck

63.402 The role of memory retrieval and decision when dividing attention in a Gabor patch change detection task James C Moreland, John Palmer, Geoffrey M Boynton

63.403 Storage unit in visual working memory depends on the visual information load of a memory display Jiehui Qian, Shengxi Lei, Ke Zhang, Quan Lei

63.404 The capacity of visual working memory for scenes Kazuhiko Yokosawa, Qi Li

63.405 The Effects of Change Probability and Object Typicality on Visual Working Memory and Visual Attention Eduardo E Hernandez, Katherine C Moen, Melissa R Beck

63.407 Apple of my eye: Incidental learning of change probability biases visual attention to food categories Anna M Wright, Katherine C Moen, Melissa R Beck

#### Visual Memory: Long term memory

Wednesday, May 23, 8:30 am - 12:30 pm, Pavilion

63.409 Up-regulatory nature of voluntary control for visual long-term memory encoding and its down-regulatory side effects Caitlin Tozios, Keisuke Fukuda

63.410 The intrinsic memorability of an image is associated with familiarity and recollection Nico Broers, Niko A. Busch

63.411 Visual memorability in the absence of semantic content Qi Lin, Sami R Yousif, Brian Scholl, Marvin M Chun

63.412 **Incidental versus intentional image memorability** Lore Goetschalckx, Jade Moors, Johan Wagemans

63.413 The impact of interruptions on long-term object processing Lisa M Heisterberg, Yoolim Hong, Andrew B Leber

63.414 Prior repetition impairs the accessibility, not the fidelity, of new source memory Do-Joon Yi, Yonsu Kim

63.415 Repetition allows for long-term memories that are as precise as the best working memories Annalise E Miner, Timothy F Brady

63.416 **Temporal visual statistical learning is enhanced by increasing working memory demands related to sequence members** Kenjin B. Chang, Leeland L. Rogers, Timothy J. Vickery

63.417 **Task-relevant category differences strongly influence temporal visual statistical learning** Timothy Vickery, Su Hyoun Park, Marian E. Berryhill, Valerie M. Beck

63.418 Statistical Regularities During Object Encoding Distort Long-term Memory Paul S Scotti, Yoolim Hong, Julie D Golomb, Andrew B Leber

63.419 How abstract are the representations derived from visual statistical learning? Su Hyoun Park, Leeland L Rogers, Timothy J Vickery

63.420 Representation in activated long-term memory is not sufficient to induce an attentional control setting Lindsay Plater, Naseem Al-Aidroos

63.421 Attraction to the recent past in aesthetic judgments: a positive serial dependency for ratings of artwork Sujin Kim, David Alais

#### Perceptual Organization: Shapes and objects

Wednesday, May 23, 8:30 am - 12:30 pm, Pavilion

63.422 Size and Aspect Ratio Judgments in Younger and Older Adults Jessica N Cali, Patrick J Bennett, Allison B Sekuler

63.423 Evaluating Shape Representations using Machine Learning Systems Michael Slugocki, Allison B. Sekuler, Patrick J. Bennett

63.424 Is shape coding elementary? David R Badcock, Yi Shin Victoria Wong, J. Edwin Dickinson

63.425 **Curvature Discrimination through Kinetic Occlusion** Benjamin A Miller, John Andersen

63.426 The automaticity of Tetris: Disconnected 'parts' activate visual representations of their potential 'wholes' Chenxiao Guan, Chaz Firestone

63.427 Vision science at the bar: The role of closure in a powerful geometric illusion Jose Rivera-Aparicio, Chaz Firestone

63.428 **Size-contrast illusion induced by unconscious context** Yusuke Nakashima, So Kanazawa, Masami Yamaguchi, Yoichi Sugita

63.429 **Object memories alter the appearance of blurry object borders** Diana C Perez, Sarah M Cook, Mary A Peterson

63.430 Do Semantic Expectations Arising From Masked Word Primes Aid Object Detection At The Earliest Level? Now You See It, Now You Don't Rachel M Skocypec, Mary A Peterson

63.431 The Effects of Temporal and Featural Dynamics of the Fovea on Peripheral Perception Kaleb T Kinder, Caglar Tas

63.432 Retinotopically specific adaptation reveals different categories of causal events: Launching vs. entraining Jonathan F Kominsky, Brian Scholl

63.433 **The origin of spatial biases: Memory, perception, or action?** Sami R Yousif, Yi-Chia Chen, Brian Scholl

63.434 Decoding and reconstructing summary statistical information from human visual cortex Sol Z Sun, Susanne Ferber, Jonathan S Cant

63.435 **The dimensionality of beauty** Qihan Wu, Aenne A Brielmann, Mika S Simoncelli, Denis G Pelli

63.436 **Perceiving Graphs as Ambiguous Figures** Cindy Xiong, Lisanne van Weelden, Steven L. Franconeri

63.437 A review of objects versus substances in visual thinking with data visualizations Caitlyn M McColeman, Steven L Franconeri

63.438 Give me a hand: Investigating the role of visual and response modalities on object-based warping using VR technolog Joshua E Zosky, Elise R Thayer, Timothy J Vickery, Michael D Dodd

#### Faces: Gaze, attractiveness, social cues

Wednesday, May 23, 8:30 am - 12:30 pm, Pavilion

63.439 Face gaze and identity are rooted in independent orientation ranges Valerie Goffaux

63.440 Contribution of Head and Eye Position to Gaze Discrimination in Human Observers Borna Mahmoudian, Hitarth Dalal, Diego Piza, Rob Nicolson, Julio Martinez-Trujillo

63.441 Integrated effect of gaze cueing and valence of 'gazed' objects on facial trustworthiness Risako Shirai, Hirokazu Ogawa

63.442 Looking into the future: An inward bias in aesthetic experience driven only by gaze cues Yi-Chia Chen, Clara Colombatto, Brian Scholl

63.443 **The role of spatial-frequency channels in the perception of female facial attractiveness.** Sujin Lee, Sohee Jang, Kyoudong Lee, Hoon Choi

63.444 Visual Perception of Facial Attractiveness and Typicality Reflects an Ideal Dimension of Face Category Structure Logan T Trujillo, Erin M Anderson, Judith H Langlois

63.445 Influence of lighting direction on the perception of symmetry and attractiveness of faces Alexandra R Hibble, Paul J Azzopardi

63.446 I get more attractive with a little help from my friends: Dual mechanisms underlie the cheerleader effect Daniel J Carragher, Nicole A Thomas, Mike E R Nicholls

63.447 Eyelashes and Attraction: Eyelash Length and Fullness are Significantly Correlated with Facial Attractiveness Erick Aguinaldo, Maedeh Mousavi, Jessie Peissig

63.448 Rapid categorization of gender from natural face images in the human brain Diane Rekow, Jean-Yves Baudouin, Bruno Rossion, Arnaud Leleu

63.449 **Rapid detection of social interactions in the human brain** Leyla Isik, Anna Mynick, Kami Koldewyn, Nancy Kanwisher

63.450 Looking at faces supports the segmentation of both social and nonsocial events. Francesca Capozzi, Jelena Ristic

63.451 Social Networks: Analyzing Social Information in Deep Convolutional Neural Networks Trained for Face Identification Connor J Parde, Ying Hu, Carlos Castillo, Swami Sankaranarayanan, Alice J O'Toole 63.452 Analysing the facial expressions of large audiences during artistic performances Nick E Barraclough, Richard A Oakes, Lisa Peschel

63.453 **The Strength of Adaptation to Negative versus Positive Emotional Information Depends on Social Anxiety Status** Erinda Morina, Sarah C. Izen, Vivian M. Ciaramitaro

63.454 **Personality trait inferences from three-dimensional body shapes** Ying Hu, Connor J Parde, Matthew Q Hill, Naureen Mahmood, Alice J O'Toole

63.455 How to Get Away with Murder: The Effect of Hoodies and Glasses on Facial Recognition Alexis T Drain, Rebecca Fisk, Cindy M Bukach, Iris Blandon-Gitlin, Jessie J Peissig

# **Topic Index**

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**3D Perception: Mechanisms and models** Poster Presentation (23.419-23.434) Saturday, May 19, 8:30 am - 12:30 pm

**3D Perception: Objects and surfaces** Oral Presentation (42.11-42.16) Monday, May 21, 10:45 am - 12:15 pm

**3D Perception: Space** Poster Presentation (33.452-33.466) Sunday, May 20, 8:30 am - 12:30 pm

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Attention: Exogenous and endogenous Poster Presentation (63.313-63.320) Wednesday, May 23, 8:30 am - 12:30 pm

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Attention: Features and objects Oral Presentation (22.11-22.17) Saturday, May 19, 10:45 am - 12:30 pm

Attention: Features, objects, faces Poster Presentation (26.431-26.451) Saturday, May 19, 2:45 - 6:45 pm

Attention: Inattention and attentional blink

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Attention: Individual differences Poster Presentation (56.345-56.356) Tuesday, May 22, 2:45 - 6:45 pm

Attention: Models, methods and multiple targets

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Attention: Resources divided and suppressed

Poster Presentation (33.425-33.438) Sunday, May 20, 8:30 am - 12:30 pm **Attention: Reward, motivation, emotion** Poster Presentation (63.301-63.311) Wednesday, May 23, 8:30 am - 12:30 pm

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Attention: Temporal, tracking and divided Oral Presentation (42.21-42.26) Monday, May 21, 10:45 am - 12:15 pm

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**Binocular Vision: Neural mechanisms** Oral Presentation (34.21-34.27) Sunday, May 20, 2:30 - 4:15 pm

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**Binocular Vision: Stereopsis** Poster Presentation (53.420-53.432) Tuesday, May 22, 8:30 am - 12:30 pm

Color and Light: Cognition and preference

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**Color and Light: Higher level** Oral Presentation (51.21-51.26) Tuesday, May 22, 8:15 - 9:45 am

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**Color and Light: Lower level** Oral Presentation (31.21-31.26) Sunday, May 20, 8:15 - 9:45 am

## Color and Light: Psychophysical and neural mechanisms

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Color and light: Surfaces, illuminants, materials

Poster Presentation (26.313-26.327) Saturday, May 19, 2:45 - 6:45 pm **Development and Disorders** Oral Presentation (35.11-35.18) Sunday, May 20, 5:15 - 7:15 pm

**Development: Experience and disorders** Poster Presentation (23.301-23.315) Saturday, May 19, 8:30 am - 12:30 pm

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**Eye Movements: Faces, objects, scene recognition** Poster Presentation (26.328-26.343) Saturday, May 19, 2:45 - 6:45 pm

**Eye Movements: Neural mechanisms** Oral Presentation (25.21-25.26) Saturday, May 19, 5:15 - 6:45 pm

**Eye Movements: Perception and remapping** Poster Presentation (63.332-63.349) Wednesday, May 23, 8:30 am - 12:30 pm

**Eye Movements: Performance** Oral Presentation (32.21-32.27) Sunday, May 20, 10:45 am - 12:30 pm

**Eye Movements: Pupil and melanopsin** Poster Presentation (43.467-43.474) Monday, May 21, 8:30 am - 12:30 pm

**Eye Movements: Pursuit, vergence, blink** Poster Presentation (36.334-36.344) Sunday, May 20, 2:45 - 6:45 pm

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**Faces: Emotions** Poster Presentation (36.345-36.362) Sunday, May 20, 2:45 - 6:45 pm Faces: Familiarity and other-race effects Poster Presentation (56.318-56.335) Tuesday, May 22, 2:45 - 6:45 pm

**Faces: Gaze, attractiveness, social cues** Poster Presentation (63.439-63.455) Wednesday, May 23, 8:30 am - 12:30 pm

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Faces: Neural mechanisms 1 Poster Presentation (53.301-53.310) Tuesday, May 22, 8:30 am - 12:30 pm

Faces: Neural mechanisms 2 Poster Presentation (56.301-56.317) Tuesday, May 22, 2:45 - 6:45 pm

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**Motion: Neural mechanisms and models** Poster Presentation (26.462-26.478) Saturday, May 19, 2:45 - 6:45 pm

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## Multisensory Processing: Vision and audition

Poster Presentation (56.357-56.373) Tuesday, May 22, 2:45 - 6:45 pm

## Multisensory Processing: Vision, haptics, body image

Poster Presentation (23.368-23.379) Saturday, May 19, 8:30 am - 12:30 pm

Multisensory Processing: Vision, vestibular, models

Poster Presentation (43.360-43.365) Monday, May 21, 8:30 am - 12:30 pm **Object Recognition: Categories** Poster Presentation (33.311-33.329) Sunday, May 20, 8:30 am - 12:30 pm

**Object Recognition: Categories** Oral Presentation (35.21-35.28) Sunday, May 20, 5:15 - 7:15 pm

Object Recognition: Features, parts, models

Poster Presentation (33.330-33.348) Sunday, May 20, 8:30 am - 12:30 pm

**Object Recognition: Neural Mechanisms** Poster Presentation (56.401-56.418) Tuesday, May 22, 2:45 - 6:45 pm

**Object Recognition: Neural networks** Oral Presentation (52.21-52.27) Tuesday, May 22, 10:45 am - 12:30 pm

**Object Recognition: Reading and other** Poster Presentation (56.419-56.435) Tuesday, May 22, 2:45 - 6:45 pm

## Perception and Action: Affordances and judgments

Poster Presentation (63.321-63.331) Wednesday, May 23, 8:30 am - 12:30 pm

Perception and Action: Arm movements and tools

Poster Presentation (43.431-43.440) Monday, May 21, 8:30 am - 12:30 pm

**Perception and Action: Decision making** Poster Presentation (36.430-36.442) Sunday, May 20, 2:45 - 6:45 pm

**Perception and Action: Decisions** Oral Presentation (54.11-54.17) Tuesday, May 22, 2:30 - 4:15 pm

## Perception and Action: Neural mechanisms

Poster Presentation (33.349-33.366) Sunday, May 20, 8:30 am - 12:30 pm

**Perception and Action: Performance** Oral Presentation (24.11-24.17) Saturday, May 19, 2:30 - 4:15 pm

Perception and Action: Reaching and grasping

Poster Presentation (23.334-23.349) Saturday, May 19, 8:30 am - 12:30 pm

#### Perception and Action: Walking,

navigating, driving Poster Presentation (53.468-53.479) Tuesday, May 22, 8:30 am - 12:30 pm

**Perceptual Learning: Applied** Oral Presentation (55.21-55.28) Tuesday, May 22, 5:15 - 7:15 pm

**Perceptual Learning: Basic** Oral Presentation (21.21-21.26) Saturday, May 19, 8:15 - 9:45 am Perceptual Learning: Models and neural mechanisms Poster Presentation (43.321-43.340) Monday, May 21, 8:30 am - 12:30 pm

Perceptual Learning: Perception and performance Poster Presentation (26.354-26.377) Saturday, May 19, 2:45 - 6:45 pm

**Perceptual Organization** Oral Presentation (54.21-54.27) Tuesday, May 22, 2:30 - 4:15 pm

**Perceptual Organization: Contours and surfaces** Poster Presentation (43.366-43.380)

Monday, May 21, 8:30 am - 12:30 pm Perceptual Organization: Ensembles,

**averaging, numerosity** Poster Presentation (23.350-23.367) Saturday, May 19, 8:30 am - 12:30 pm

Perceptual Organization: Grouping and segmentation

Poster Presentation (33.367-33.375) Sunday, May 20, 8:30 am - 12:30 pm

## Perceptual Organization: Shapes and objects

Poster Presentation (63.422-63.438) Wednesday, May 23, 8:30 am - 12:30 pm

Scene Perception Oral Presentation (62.21-62.27) Wednesday, May 23, 11:00 am - 12:45 pm

## Scene Perception: Categorization and memory

Poster Presentation (23.435-23.453) Saturday, May 19, 8:30 am - 12:30 pm

Scene Perception: Mechanisms and models

Poster Presentation (43.301-43.320) Monday, May 21, 8:30 am - 12:30 pm

Scene Perception: Objects, search, complexity

Poster Presentation (33.301-33.310) Sunday, May 20, 8:30 am - 12:30 pm

**Spatial Vision: Crowding and eccentricity** Poster Presentation (43.441-43.451) Monday, May 21, 8:30 am - 12:30 pm

**Spatial Vision: Modeling and physiology** Oral Presentation (22.21-22.27) Saturday, May 19, 10:45 am - 12:30 pm

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**Spatial Vision: Neural mechanisms** Poster Presentation (26.344-26.353) Saturday, May 19, 2:45 - 6:45 pm

**Spatial Vision: Textures and statistics** Poster Presentation (36.363-36.374) Sunday, May 20, 2:45 - 6:45 pm **Temporal Processing** Oral Presentation (41.21-41.26) Monday, May 21, 8:15 - 9:45 am

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Notes	

# **TradeWinds Island Resort Directory**



#### DINING & ENTERTAINMENT



and cocktails....1







Breakfast & Dinner – Casual dining, steak &

seafood, sunset view . 21



Breakfast pastries, fruit, snacks, beer/wine, sandwiches to order . . . . . . . . 1



Lunch, tropical drinks, and sunset dinners . 12



Casual indoor and outdoor dining for all meals . . . . 29



Pizza, wings, ice cream and sundaes....23



Exceptional cuisine for Lunch and Dinner, Sunday Brunch Buffet ... 4



Live entertainment, bottled beer and 

Tiki bar, tropical drinks, Lunch and lite bites . . . 22





Starbucks<sup>™</sup> coffee, on-the-go-breakfasts, 

> Tropical drinks, beer, wine and appetizers . 31

#### **MEETING & EVENT FACILITIES, ISLAND GRAND**

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Banyan Breezeway5
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Chart Room, 2nd floor 3
Citrus
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Cypress Villa, 2nd floor17
Garden Courtyard 6
Glades
Grand Palm Colonnade 1
Horizons East & West 20
Horizons Portico
Indian Key
Island Ballroom 2
Jacaranda Beach9
Jacaranda Hall 5
Jasmine
Long Key
Palm 5
The Pavilion18
Pirate Island16
Royal Tern, 2nd floor 3
Sabal
Sawgrass
Sawyer Key 2
SeaBreeze Terrace11
South Beach Lawn 8
Snowy Egret, 2nd floor 3
Tarpon Key 2

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#### **GUY HARVEY OUTPOST**

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Guy Harvey Outfitter Shop27
Guy's Gulfside Grill 29
Li'l Guys Activities
North Terrace Courtyard 32
Oasis Adult Courtyard
Perks Up Coffee & more26
Sunset Beach
SandBar

# **Tradewinds Island Grand Resort**



## **Vision Sciences Society** 18<sup>th</sup> Annual Meeting May 18 - 23, 2018

