

# MODVIS 2026: Computational and Mathematical Models in Vision

Blue Heron Room, Tradewinds Island Grand, St Pete Beach FL

**WEDNESDAY MAY 13<sup>th</sup>**

8:30 **Coffee, bagels, pastries, fruit**

9:00 **MODVIS welcome** — *Anne Sereno*

## **Attention**

*Moderator: Anne Sereno*

9:05 **Vision as looking and seeing through a bottleneck: theory and experimental tests**

Li Zhaoping

*Max Planck Institute for Biological Cybernetics and the University of Tübingen*

9:30 **Insights into the development of visual attention using the binding-spiking search over time and space (b-sSoTS) model**

Jennifer Klein [1], Harriet A. Allen [2], John Clibbens [1], Amy Cook [1], Virginia Amanatidou [3], and Eirini Mavritsaki [1]

*[1] Birmingham City University, [2] University of Nottingham, [3] Herefordshire and Worcestershire Health and Care NHS Trust*

9:55 **How attention changes objective performance and subjective strength: Explanation from a population spike model**

Lana Okubo

**10:20 Coffee**

## **Experience**

*Moderator: Jonathan Victor*

10:45 **An empirical test of model predictions for an induced perceptual grouping task**

Maria Kon [1,2], Gregory Francis [3]

*[1] U.S. Naval Research Laboratory, [2] Purdue University, [3] University of Southern Denmark*

11:10 **Inferring Experience-Dependent Changes in Face Neural Encoding Using a Collapsed Population Model**

Fabian Soto

11:35 **Cross-Stream Contrastive Learning Inspired by Feature-Biased Visual Processing**

Zhixian Han [1], Anne B. Sereno [1, 2]

*[1] Purdue University [2] Indiana University School of Medicine*

**12:00 Lunch break**

## Colors

*Moderator: Jeff Mulligan*

**14:00 Natural retinal image statistics and the design of an optimal trichromatic array**

Deepthi Bannai, Alexander Belsten, Bruno Olshausen, Jacob Yates

*University of California, Berkeley*

**14:25 Edge integration in color perception**

Michael Rudd

*University of Nevada, Reno*

**14:50 Quantitative model of parvo and magno components in central and peripheral grating acuity and in motion direction perception**

George Sperling, Lingyu Gan

*University of California, Irvine*

**15:15 Coffee**

## Channels

*Moderator: Tim Oleskiw*

**15:45 Modeling the Local Channel Structure of Human Vision**

Christopher Tyler

*Smith-Kettlewell Eye Research Institute*

**16:10 SimpleStereo: Keeping Stereo Vision in Retinal (vs World) Coordinates + QualiaNet: An Experience-Before-Inference Network**

Paul Linton

*Columbia University*

**16:35 Lattice: A Modular Framework for Scalable Hierarchical Bayesian Inference in Sequential Sampling Models**

Steven Shofner, Paul Dasonville

*University of Oregon*

**17:00 Recovering constraints on recurrent connectivity in primary visual cortex using Bayesian optimization**

Joseph Emerson [1], Brock Carlson [1], Vera Lindh [1], Ryan Holland [2], Yifan Hu [2], Audrey Sederberg [3], Gordon Smith [2], & Cheryl Olman [1,2]

*1 University of Minnesota College of Liberal Arts 2 University of Minnesota School of Medicine*

*3 Georgia Institute of Technology*

**17:25 End of first day**

## THURSDAY MAY 14th

8:30 **Coffee, bagels, pastries, fruit**

9:00 **MODVIS resumes** — *Qasim Zaidi*

### Learning

*Moderator: Qasim Zaidi*

9:05 **Developmental temporal progression promotes integration and robustness in 3D convolutional neural networks**

Marin Vogelsang, Lukas Vogelsang, Pawan Sinha

*MIT*

9:30 **Developmentally degraded visual input promotes Gestalt-like representations in deep neural networks**

Lukas Vogelsang [1], Marin Vogelsang [1], Jeonghwan Cheon [2], Priti Gupta [3], Pragya Shah [3], Purva Sethi [3], Stutee Narang [3], Suma Ganesh [3], Pawan Sinha [1]

*[1] MIT, [2] Independent Researcher, [3] Dr. Shroff's Charity Eye Hospital*

9:55 **Predicting Detail from Blur Enables Learning of Robust Vision Representations**

Akihito Maruya, Hossein Adeli Jelodar, Tian Zeng, Nikolaus Kriegeskorte, Ning Qian

*Columbia University*

10:20 **Coffee**

### Networks

*Moderator: Mengmi Zhang*

10:45 **Perceptual attractive and repulsive biases spontaneously emerge during generative model learning**

Hyun-Jun Jeon, Hansol Choi, Oh-Sang Kwon

*Ulsan National Institute of Science and Technology (UNIST)*

11:10 **A Variational Framework for Adaptive Working Memory: Modeling Goal-Directed Resource Allocation through Sparse Gaussian Process Approximation**

Dongyu Gong, Mario Belledonne, Ilker Yildirim

*Yale University*

11:35 **The gorilla in the machine: Multigranularity Optimization as a new account of inattentive blindness**

Mario Belledonne, Ilker Yildirim

*Yale University*

12:00 **Lunch break**

## Forms

*Moderator: Zygmunt Pizlo*

**14:00 Computational models reveal intuitive physics and statistical cues separately contribute to the visual perception of liquids**

Yuting Zhang [1], Wenyan Bi [1], Yuyang Miao [2], Ilker Yildirim [1]  
[1] *Yale University*, [2] *Columbia University*

**14:25 Sparse coding of natural shape**

Galen Chuang, James H. Elder, Timothy D. Oleskiw  
*UC Berkeley, York University, University of Regina*

**14:50 When Form Meets Motion: Recurrent Connections Enhance Biological Motion Perception**

Shuangpeng Han [1], Ziyu Wang [1], Thomas Serre [2], Mengmi Zhang [1]  
[1] *Nanyang Technological University*, [2] *Brown University*

15:15 **Coffee & business meeting:** *Jeff Mulligan*

## Patterns

*Moderator: Christopher Tyler*

**15:45 Perceptual space for dual-component plaids**

Yi Xu, Qasim Zaidi  
*SUNY Graduate Center for Vision Research*

**16:10 Cross-orientation suppression emerges from a minimal supralinear stabilized network**

Brock Carlson [1], Joseph Emerson [1], Vera Lindh [1], Ryan Holland [2], Yifan Hu [2], Audrey Sederberg [3], Gordon Smith [2], & Cheryl Olman [1,2]  
1 *University of Minnesota College of Liberal Arts* 2 *University of Minnesota School of Medicine* 3 *Georgia Institute of Technology*

## Keynote

16:35 **Introduction** — Qasim Zaidi

**16:40 Texture as a bridge between algorithmically constructed and naturalistic stimuli**

Jonathan Victor  
*Weill Cornell Medical College*

17:40 **MODVIS ends**