

# 2020 Friends of HVEI Banquet

*a gathering for researchers at the intersection of human perception and imaging technology*

Hosted by Human Vision and Electronic Imaging Conference Chairs Damon Chandler, Mark McCourt, and Jeffrey Mulligan

Tannourine Restaurant • 120 W 25th Ave. • San Mateo, CA

**Wednesday, January 29, 7:00 – 10:00 pm**

*featuring*

Bruno Olshausen, professor, School of Optometry and Helen Wills Neuroscience Institute,  
and director, Redwood Center for Theoretical Neuroscience, UC Berkeley

## Perception as Inference

Our subjective experience of the visual world is nothing like the 2D images sensed by our retinæ. We experience a stable world full of well-defined geometric shapes and object boundaries, 3D surfaces with continuous shading and reflectance along with their material properties, yet the retinal image is highly unstable, discretely sampled by a highly non-uniform lattice of retinal ganglion cells, and relayed to the cortex via punctate spike trains. How do we explain this? Or is it even something that needs to be explained? This talk presents the point of view that our subjective experience is a mostly correct hallucination about the external world which the brain works very hard to create. It may be understood in mechanistic terms by expanding upon Helmholtz's notion of 'perception as inference' in a rigorous, mathematical manner. The inferential framework shifts us away from thinking of 'receptive fields' and 'tuning' of individual neurons, and instead toward how populations of neurons interact via horizontal and top-down feedback connections to perform collective computations. An example of this approach to account for how the cortex may achieve high-acuity visual representations from fixational drift motion is described.

**Register online at [www.electronicimaging.org](http://www.electronicimaging.org) (you may add to your existing registration)**

**OR return to [registration@imaging.org](mailto:registration@imaging.org) or via fax to +1 703 642 9094 by January 15. Space is limited.**

For questions or to register for the banquet via phone, contact +1 703 642 9090 x100

### Banquet Registration Form

\_\_\_\_ (number of tickets) @\$65 (all inclusive) = **Total \$** \_\_\_\_\_

Name(s) of attendee(s): \_\_\_\_\_

Family-style meal includes a collection of hot and cold mezze (appetizers) served with fresh pita bread; a selection of grilled entrees (including vegetarian options); dessert; beer/wine; and coffee/tea.

#### Charge tickets to:

Name \_\_\_\_\_ Company \_\_\_\_\_

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