## Francisco J. Luongo


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**Education**

**University of California, San Francisco**, San Francisco, CA

Ph.D., Neuroscience, December 2015

- Thesis Topic: *Information processing and computation in prefrontal microcircuits*
- Thesis Advisor: VIkaas S. Sohal, M.D., Ph.D

**Stanford University**, Palo Alto, CA

B.S., Biology, May 2008

**Current Position**

**Postdoctoral Fellow** — January 2016 to present
California Institute of Technology
Supervisor: Doris Y. Tsao, Ph.D

**Research Interests**

neural computation, sensory encoding/decoding models, machine learning, neural networks, cortical microcircuits, network analysis, calcium imaging, ECoG time-series analysis, scientific computing

**Past Research Experience**

**Doctoral Student** — June 2011 to December 2015
University of California San Francisco
Supervisor: VIkaas S. Sohal, M.D., Ph.D

**Research Assistant** — July 2008 to Aug 2010
Stanford University
Supervisor: Thomas Clandinin, Ph.D

**Undergraduate Researcher** — Dec 2006 to June 2008
Stanford University
Supervisor: Liqun Luo, Ph.D

**Publications**

1. Kirkby L., **Luongo, F.**, Rao, V., Dawes, H., Chang, E., and Sohal, V.S. "An amygdala-hippocampus subnetwork that encodes variation in human mood." November 2018 *Cell* ***In press***
2. Marton, T., Seifikar, H., **Luongo, F.**, and Sohal, V.S. "Roles of prefrontal cortex and mediodorsal thalamus in task engagement and behavioral flexibility." *Journal of Neuroscience*, February 2018 *link*
3. **Luongo, F.**, Zimmerman, C., Horn, M., and Sohal, V.S. "Correlations between prefrontal neurons form a small world network that optimizes the generation of multineuron sequences of activity." *Journal of Neurophysiology*, May 2016 *link*
4. **Luongo, F.**, Horn, M., and Sohal, V.S. "Putative microcircuit-level substrates for attention are disrupted in mouse models of autism." *Biological Psychiatry*, Apr 2016 *link*
5. Gee, S., Ellwood, I., Patel, T., **Luongo, F.**, Deisseroth, K., and Sohal, V.S. "Synaptic activity unmasks dopamine D2 receptor modulation of a specific class of layer V pyramidal neurons in prefrontal cortex." *Journal of Neuroscience*, February 2012. *link*
6. Gohl D.M., Silies M.A., Gao X.J., Bhalerao S., **Luongo F.J.**, Potter C.J., and Clandinin T.R. "A versatile in-vivo system for directed genetic dissection of gene expression patterns." *Nature Methods*, March 2011. *link*

## Papers in Preparation

1. **Luongo F.**, Liu, L., Tsao, D. "A visual shortcut to figure ground perception in a low-acuity animal."
2. **Luongo, F.**, Kirkby, L., Lee, M., Dawes, H., Chang, E.C., Sohal, V.S. "Key interactions efficiently summarize distributed network activity within chronic, large-scale recordings in the human brain."

## Relevant Talks

1. **Luongo F.**, 'Identifying Object Representations in the Rodent Visual System.'
   *Chen Institute Workshop on Computational Approaches to Neuroscience*, [Pasadena, CA], 2017. *link*

## Conference Abstracts

1. **Luongo, F.**, Liu, L., and Tsao, D. "A fundamental difference between rodent and primate object vision" *COSYNE*, [Lisbon, Portugal], 2019 *link*
2. **Luongo, F.**, Liu, L., and Tsao, D. "Scene segmentation in the mouse" *Society for Neuroscience (SFN)*, [Washington D.C., USA], 2017 *link*
3. **Luongo, F.**, Liu, L., and Tsao, D. "Figure ground modulation in the mouse visual system" *Society for Neuroscience (SFN)*, [Washington D.C., USA], 2017 *link*
4. **Luongo, F.**, Liu, L., and Tsao, D. "Extra-classical receptive field effects on visual processing in the awake rodent" *Society for Neuroscience (SFN)*, [San Diego, USA], 2016 *link*
5. Kirkby, L., **Luongo, F.**, Nahum, M., Van Vleet, T., Lee, M., Dawes, H., Chang, E., and Sohal, V. "Intrinsic network for mood in the human " *Society for Neuroscience (SFN)*, [San Diego, USA], 2016 *link*
6. Kirkby, L., **Luongo, F.**, Nahum, M., Van Vleet, T., Lee, M., Dawes, H., Chang, E., and Sohal, V. "Neural biomarkers of mood in the human mesolimbic network" *Society for Neuroscience (SFN)*, [Chicago, USA], 2015 *link*
7. **Luongo, F.**, Horn, M., and Sohal, V.S. "Changes in prefrontal microcircuit organization increase repetitive network activity in two mouse models of autism" *AREADNE: Research in encoding and decoding of neural ensembles*, [Santorini, Greece], 2014. *link*
8. **Luongo, F.**, Horn, M., and Sohal, V.S. "Changes in prefrontal microcircuit organization increase repetitive network activity in two mouse models of autism" *COSYNE*, [Salt Lake City, Utah], 2014. *link*

## Funding

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| Burroughs Wellcome Fund PDEP award | 2018-2021 |
| Arnold O. Beckman Postdoctoral Fellowship (Accepted) | 2017-2019 |
| Della Martin Postdoctoral Fellowship (Awarded) | 2017 |
| National Institute of General Medicine IMSD predoctoral fellow | 2010-2013 |

## Relevant coursework

Methods in computational neuroscience, Bayesian inference, Machine Learning Summer School (MLSS), Linear algebra, Multi-variable calculus, Statistics

## Techniques and Software Skills

Techniques:

2-photon calcium imaging, electrophysiology, Optogenetics, calcium imaging, micro-endoscope imaging, histology, cloning, drosophila genetics

Programming languages
python, MATLAB, unix, git, bash

## REFERENCES


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