

# Paroma Varma

## Curriculum Vitae

✉ [paroma@stanford.edu](mailto:paroma@stanford.edu)

 [paromavarma](#)

### Research Interests

Machine Learning, Weak Supervision, Signal Processing

### Education

**Doctor of Philosophy**, *Electrical Engineering*, Stanford University, Stanford, CA.

2017 **Master of Science**, *Electrical Engineering*, Stanford University, Stanford, CA.

2015 **Bachelor of Science**, *Electrical Engineering and Computer Science*, University of California at Berkeley, Berkeley, CA.

### Fellowships and Awards

National Science Foundation Graduate Research Fellowship

Stanford Graduate Research Fellowship

Arthur M. Hopkin Award for High Academic Achievement

Outstanding Course Development and Teaching Award

### Research Experience

*Stanford InfoLab, Advisor: Christopher Ré*

- Focusing on weak supervision models to automate process of labeling data
- Building a system to recognize and correct misspecified generative models

*Stanford Computational Imaging Group, Advisor: Gordon Wetzstein*

- Implemented proximal methods to solve 3D deconvolution problems efficiently
- Approximating aberrations in an optical system through PSF phase retrieval

*Computational Imaging Lab, Advisor: Laura Waller*

- Utilized non-linear least squares and iterative phase retrieval to extract phase and illumination source from partially coherent defocus images
- Adapted blind deconvolution algorithm to estimate PSF and improve depth of focus in digital holography

*Helen Wills Neuroscience Institute, Advisor: Robert Knight*

- Developed algorithm for automated identification of neural oscillatory components for various forms of electrophysiological data
- Examined spatio-temporal dynamics of decision making in the pre-frontal cortex using ECoG

## Teaching and Mentoring Experience

### TA for EE16A, Designing Devices and Systems

- Helped develop course material and lab-based projects for pilot offering of the class
- Taught weekly sections and labs, designed homework and discussion problems

### TA for EE20N, Signals and Systems

- Taught weekly sections and labs

### EECS Peer Advisor

- Held weekly drop-in hours for academic and policy advising

## Industry Experience

### Tablet and Netbooks Group Intern, Intel Corporation

- Developed algorithm to adjust camera's colorspace to better represent true color values
- Created internal testing tool to analyze image colors from tablet cameras

### Business Intelligence Intern, GAP Inc.

- Used Selenium and Cucumber for automated testing of web-based reporting software (Microstrategy)
- Wrote scripts to solve issue regarding Microstrategy reports timing out

## Abstracts, Presentations, and Publications

- 2017 P. Varma, D. Iter, C. De Sa, C. Ré. Flipper: A Systematic Approach to Debugging Training Sets. *HILDA*
- 2016 P. Varma, R. Yu, D. Iter, C. De Sa, C. Ré. Socratic Learning: Correcting Misspecified Generative Models using Discriminative Models. *arXiv, FILM-NIPS*
- 2016 P. Varma, G. Wetzstein. Efficient 3D Deconvolution Microscopy with Proximal Algorithms. *Imaging and Applied Optics Congress*
- 2015 J. Zhong, L. Tian, P. Varma, L. Waller. Nonlinear Optimization Algorithm for Partially Coherent Phase Retrieval and Source Recovery. *IEEE Transactions on Computational Imaging*
- 2015 J. Zhong, P. Varma, L. Tian, L. Waller. Source Shape Estimation in Partially Coherent Phase Imaging with Defocused Intensity. *Imaging and Applied Optics Congress, Arlington, Virginia*
- 2015 Z. Phillips, G. Gunjala, P. Varma, J. Zhong, L. Waller. Design of a Domed LED Illuminator for High-Angle Computational Illumination. *Imaging and Applied Optics Congress, Arlington, Virginia*
- 2015 L. Waller, L. Tian, J. Zhong, P. Varma. Phase Microscopy and 3D Imaging with Partially Coherent Light. *OSA Technical Digest (online)*
- 2014 M. Haller, P. Varma, T. Noto, R.T. Knight, A.Y. Shestyuk, B. Voytek. Automated "Spectral Fingerprinting" of Electrophysiological Oscillations. *Society for Neuroscience, Washington DC*
- 2014 P. Varma, D. Shuldman, L. Waller. Improving Depth Resolution in Digital Holography through Blind Deconvolution. *National Science Foundation REU, UC Berkeley*

- 2014 M. Haller, P. Varma, L.M. Rosenberg, N.E. Crone, E.F. Chang, J. Parvizi, R.T. Knight, A.Y. Shestyuk. Temporally Sustained Activity in Lateral Prefrontal Cortex Supports Decision Making. *International Conference on Cognitive Neuroscience*, Brisbane, Australia
- 2014 M. Haller, L.M. Rosenberg, P. Varma, N.E. Crone, E.F. Chang, J. Parvizi, R.T. Knight, A.Y. Shestyuk. High Gamma Duration in Human Prefrontal Cortex Predicts Decision Time. *International Neuropsychological Society*, Jerusalem, Israel