

## Aravinthan D.T. Samuel, *Curriculum Vitae*

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### Education

Harvard University	Cambridge, MA	Neuroscience	Postdoctoral Fellow, 1999-2003
Harvard University	Cambridge, MA	Biophysics	Ph.D., 1999
Harvard University	Cambridge, MA	Physics	B.A. 1993

### Professional Appointments

2010 – present	Professor of Physics, Harvard University
2008 – 2010	Associate Professor of Physics, Harvard University
2003 – 2008	Assistant Professor of Physics, Harvard University

### Honors

2008	NIH Director's Pioneer Award
2007	Dana Foundation Award in Brain and Immuno-imaging
2006	Presidential Early Career Award for Scientists and Engineers
2005	NSF CAREER Award
2005	McKnight Scholar
2004	Alfred P. Sloan Foundation Research Fellow
2000	Amgen Fellow of the Life Sciences Research Foundation

### Research

I am interested in the motile behavior of small organisms. We use biophysics to understand how behavior is organized by underlying computational networks that transform sensory perception into motor decisions. I began studying the chemotactic behavior of *Escherichia coli* as a graduate student with Howard Berg. In our lab, we study navigational behaviors in the nematode *Caenorhabditis elegans* and the *Drosophila* larva. We build and use tools for quantitative behavioral analysis in defined stimulus environments, for optical neurophysiology of neural circuits, and for the structural reconstruction of neural circuits using electron microscopy. We seek the structure and function of networks that perform the computations needed for purposeful behavior.

### Teaching

I developed three courses that constitute my main teaching activities at Harvard University.

Freshman Seminar 51x	Changing Perspectives: The Science of Optics in the Visual Arts
Physics 140	Introduction to the Physics of Living Systems
Physics/Neuro 141	The Physics of Sensory Systems in Biology

## Publications

- [86] C. Eschbach, A. Fushiki, M. Winding, B. Afonso, I. V. Andrade, B. T. Cocanougher, K. Eichler, R. Gepner, G. Si, J. Valdes-Aleman, R. D. Fetter, M. Gershow, G. S. Jefferis, A. D. Samuel, J. W. Truman, A. Cardona, and M. Zlatic, "Circuits for integrating learned and innate valences in the insect brain," *eLife*, vol. 10, e62567, 2021.
- [85] L. Hernandez-Nunez, A. Chen, G. Budelli, V. Richter, A. Rist, A. S. Thum, M. Klein, P. Garrity, and A. D. Samuel, "Opponent thermosensory cells use flexible cross-inhibition for context-dependent choice in *Drosophila* thermotaxis," *Science Advances*, vol. 7, eabg6707, 2021.
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- [83] V. Susoy, W. Hung, D. Witvliet, J. E. Whitener, M. Wu, B. J. Graham, M. Zhen, V. Venkatachalam, and A. D. Samuel, "Natural sensory context drives diverse brain-wide activity during *C. elegans* mating," *Cell*, in press, 2021.
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- [80] E. Yemini, A. Lin, A. Nejatbakhsh, E. Varol, R. Sun, G. E. Mena, A. D. Samuel, L. Paninski, V. Venkatachalam, and O. Hobert, "NeuroPAL: A Multicolor Atlas for Whole-Brain Neuronal Identification in *C. elegans*," *Cell*, vol. 184, no. 1, 272–288.e11, 2021.
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- [78] L. Mi, H. Wang, Y. Meirovitch, R. Schalek, S. C. Turaga, J. W. Lichtman, A. D. Samuel, and N. Shavit, "Learning Guided Electron Microscopy with Active Acquisition," *MICCAI: International Conference on Medical Image Computing and Computer-Assisted Intervention, Lecture Notes in Computer Science*, vol. 12265, pp. 77–87, 2020.
- [77] A. Nejatbakhsh, E. Varol, E. Yemini, V. Venkatachalam, A. Lin, A. D. Samuel, O. Hobert, and L. Paninski, "Demixing Calcium Imaging Data in *C. elegans* via Deformable Non-negative Matrix Factorization," *MICCAI: International Conference on Medical Image Computing and Computer-Assisted Intervention, Lecture Notes in Computer Science*, vol. 12265, pp. 14–24, 2020.
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