

# Daniel Benjamin Aharoni, Ph.D.

Curriculum Vitae  
September 12<sup>th</sup>, 2018

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## PERSONAL HISTORY

Department of Neurology  
10833 Le Conte Ave  
University of California, Los Angeles  
Los Angeles, CA 90095  
DAharoni@mednet.ucla.edu

## EDUCATION

B.S., Physics, Magna Cum Laude  
University of California, Los Angeles, 2006

Ph.D., Physics  
University of California, Los Angeles, 2013

## PROFESSIONAL EXPERIENCE

**Adjunct Assistant Professor.** University of California, Los Angeles, 2017 – Present  
Novel tool development/implementation for neuroscience applications. Focus on hardware, software, and analysis for large-scale neural recordings in freely behaving animals.

**Postdoctoral Fellow – Golshani, Silva, Khakh Labs.** University of California, Los Angeles, 2013– 2017  
Primary developer/researcher of a miniature fluorescence microscopy platform ([miniscope.org](http://miniscope.org)) for imaging neural activity in freely behaving animals. This system is currently being built/used by over 400 labs across the world investigating neurological disorders and fundamental questions in neuroscience.

**Co-Founder – Lumoto LLC.** Los Angeles, CA, 2013 – 2016  
Creator of Spinpod – a slim motion control unit for taking seamless panoramas and motion time-lapse videos.

**Graduate Student Researcher – Arisaka, Mehta Lab.** University of California, Los Angeles, 2009 – 2013  
Spatial and cognitive map studies in rodents.

**Graduate Student Researcher – Arisaka, Otis Lab.** University of California, Los Angeles, 2009 – 2013  
Designed and implemented high-speed bio-imaging devices for applications in single molecule tracking, fluorescence correlation spectroscopy, and neural imaging.

## PROFESSIONAL ACTIVITIES

Member, Integrative Center for Learning and Memory, 2018 – Present  
Reviewer, Journal of Neural Engineering, Frontiers Neuroscience, 2017 – Present  
Co-Mentor, Phil Dong, Ph.D. Student, Department of Neuroscience, Mount Sinai, 2017 – Present

Co-Founder, UCLA Miniscope Project, 2013 – Present  
Co-Director, UCLA Miniscope Workshops, 2013 – Present  
Member, Society for Neuroscience, 2012 – Present

## HONORS & AWARDS

Nominated for the Eva Kavan Prize for Excellence in Research on the Brain, 2013  
Jet Propulsion Laboratory Undergraduate Scholar, 2004  
Alexander Frolic Award for Excellence in Physics, 2004

## GRANTS & FELLOWSHIPS

U01 BRAIN Initiative Co-Investigator, 2018 – Present  
– An open source, wireless, miniature microscope for monitoring neuronal activity

NSF NeuroNex Collaborator, 2017 – Present  
– Miniaturized open source devices for calcium imaging, electrophysiology, and real-time control of neural activity

U01 BRAIN Initiative Co-Investigator, 2015 – 2018  
– Building the next generation of wireless, two-channel miniaturized microscopes for imaging freely moving mice

Neural Microcircuits Training Grant Fellow, 2015  
Neurobehavioral Genetics Training Grant Fellow, 2014

## INVITED TALKS

Cold Spring Harbor Imaging Course: Imaging Structure & Function in the Nervous System. *Miniature microscope course*  
– Cold Spring Harbor Laboratory, Cold Spring Harbor, NY August 2018

*Miniscope.org: An open-source imaging platform*  
– Neuroengineering Symposium, Drexel University, Philadelphia, PA, June 2018

Miniscope Workshops Lectures: *Imaging principles and microscope design, Data acquisition and imaging processing, Future directions of the Miniscope project, Soldering and assembly techniques, Acquisition software and Miniscope testing*  
– University of Utah Workshop, Utah, May 2018  
– MCCS pre-SfN Workshop, Washington DC, November 2017  
– Mount Sinai Workshop, New York, NY, October 2017  
– Dunedin Workshop, Dunedin, New Zealand, August 2017  
– LMU Munich Workshop, Munich, Germany, May 2017  
– MCCS pre-SfN Workshop, San Diego, CA, November 2016  
– UCLA Miniscope Workshop, Los Angeles, CA, January 2016, March 2016, April 2016, January 2017, April 2017

*Developing new tools for imaging network dynamics in freely behaving animals*  
– EECS Recruitment Seminar, UCI, Irvine, CA, May 2018

*Next generation miniature microscopes to image network dynamics in health and disease*

– Center for Neuro Technology Seminar, UCLA, Los Angeles, CA, April 2018

*The future of the UCLA Miniscope platform*

– McGill University, Montreal, Quebec, Canada, April 2018

*Building the next generation of miniature fluorescence microscopes: Research driven tool design*

– UCI, Irvine, CA, December 2017

*Building the next generation of miniature fluorescence microscopes: An overview of the open-source UCLA Miniscope project*

– NIEHS, Durham, NC, October 2017

*Miniature microscopes and the brain: Bridging the gap between neuroscience and technology*

– Occidental College, Los Angeles, CA, October 2017

*Wearable microscopes and the future of neural recording techniques*

– Kernel, Santa Monica, CA, May 2017

*Wearable microscopes and the future of neural recording techniques*

– Neuralink, San Francisco, CA, April 2017

*Building the next generation of miniature fluorescence microscopes: An open-source approach to tool development*

– Icahn School of Medicine at Mount Sinai, New York, NY, March 2017

*Building the next generation of miniature fluorescence microscopes*

– Dynamics of Neural Microcircuits Symposium, Los Angeles, CA, May, 2016

## **CONFERENCE ACTIVITY**

*Miniaturized open source devices for calcium imaging, electrophysiology, and real-time control of neural activity (Poster)*

– Brain Initiative Investigators Meeting, Bethesda, MD, April 2018

*Miniscope.org: An open-source imaging platform and online resource focused on developing the next generation of miniature fluorescence microscopes (Poster)*

– Brain Initiative Investigators Meeting, Bethesda, MD, April 2018

– Society of Neuroscience, Washington DC, November 2017

*Miniscope.org: an open-source miniature wide-field imaging platform and online collaborative resource (Poster)*

– Brain Initiative Investigators Meeting, Bethesda, MD, December 2016

– Society of Neuroscience, San Diego, CA, November 2016

– MCCS, San Diego, CA, November 2016

*Building and sharing the next generation of miniaturized microscopes for imaging neural activity in freely behaving animals (Poster)*

– Brain Initiative Investigators Meeting, Bethesda, MD, December 2015

*Open-source miniaturized fluorescence microscope for imaging large-scale neural activity in freely behaving animals (Poster)*

– Society of Neuroscience, Chicago, IL, October 2015

*Development of a non-invasive multi-modal virtual reality system for rats (Poster)*

– Brain Research Institute Neuroscience Session, Los Angeles, CA, December 2012

– Society of Neuroscience, New Orleans, LA, October 2012

## TEACHING EXPERIENCE

**Miniscope Workshop Instructor** - University of California, Los Angeles, 2016 – Present  
Designed and led local and international workshops serving over 700 researchers

**Teaching Assistant** - University of California, Los Angeles, 2007 – 2013

Physics for Scientists and Engineers: Mechanics, Electrodynamics, Optics, Special Relativity

Physics for Life Science Majors: Waves, Electricity, Magnetism

## PATENTS & PATENT APPLICATIONS

### Patent Applications

Aharoni, D.; “System and Method for Configurable Miniature Microscopy”, UCLA 2017-708, May 15, 2017

## PUBLICATIONS

Skocek\*, O.; Nobauer\*, T.; Weilguny, L.; Traub, F. M.; Xia, C. N.; Molodtsov, M. I.; Grama, A.; Yamagata, M.; **Aharoni, D.**; Cox, D. D.; Golshani, P.; Vaziri, A.; “High-speed volumetric imaging of neuronal activity in freely moving rodent”, *Nature Methods*, May 2018

DOI: [10.1038/s41592-018-0008-0](https://doi.org/10.1038/s41592-018-0008-0)

Cai\*, D. J.; **Aharoni\*, D.**; Shuman\*, T.; Shobe\*, J.; Biane, J.; Song, W.; Wei, B.; Veshkini, M.; La-Vu, M.; Lou, J.; Flores, S. E.; Kim, I.; Sano, Y.; Zhou, M.; Baumgaertel, K.; Lavi, A.; Kamata, M.; Tuszynski, M.; Mayford, M.; Golshani, P.; Silva, A. J.; “A shared neural ensemble links distinct contextual memories encoded close in time”, *Nature*, Volume 534, Issue 7605, May 2016

DOI: [10.1038/nature17955](https://doi.org/10.1038/nature17955)

Shtrhman, M.; **Aharoni, D.**; Hardy, N. F.; Buonomano, D. V.; Arisaka, K.; Otis, T. S.; “Multifocal Fluorescence Microscope for Fast Optical Recordings of Neuronal Action Potentials”, *Biophysical Journal*, Volume 108, Issue 3, February 2015

DOI: [10.1016/j.bpj.2014.12.005](https://doi.org/10.1016/j.bpj.2014.12.005)

Cushman\*, J. D.; **Aharoni\*, D.**; Willers, B.; Ravassard, P.; Kees, A.; Vuong, B.; Arisaka, K.; Mehta, M. R.; “Multisensory control of multimodal behavior”, *PLoS ONE*, Volume 8, Issue 11, June 2013

DOI: [10.1371/journal.pone.0080465](https://doi.org/10.1371/journal.pone.0080465)

Ravassard\*, P.; Willers\*, B.; Kees\*, A.; Ho, D.; **Aharoni, D.**; Cushman, J. D.; Mehta, M. R.; “Multisensory Control of Hippocampal Spatiotemporal Selectivity”, *Science*, Volume 240, Issue 6138, May 2013

DOI: [10.1126/science.1232655](https://doi.org/10.1126/science.1232655)

Michalet, X.; Colyer, R. A.; Scalia, G.; Ingargiola, A.; Lin, R.; Millaud, J. E.; Weiss, S.; Siegmund, O. H. W.; Tremsin, A. S.; Vallerger, J. V.; Cheng, A.; Levi, M.; **Aharoni, D.**; Arisaka, K.; Villa, F.; Guerrieri, F.; Panzeri, F.; Rech, I.; Gulinatti, A.; Zappa, F.; Ghioni, M.; Cova, S.; “Development of new photon-counting detectors for single-molecule fluorescence microscopy”, *Philosophical Transactions of the Royal Society B*, Volume 368, Issue 1611, February 2012  
DOI: [10.1098/rstb.2012.0035](https://doi.org/10.1098/rstb.2012.0035)

Teymourian, A.; **Aharoni, D.**; Baudis, L.; Beltrame, P.; Brown, E.; Cline, D.; Ferella, A. D.; Fukasawa, A.; Lam, C. W.; Lim, T.; Meng, Y.; Muramatsu, S.; Pantic, E.; Suyama, M.; Wang, H.; Arisaka, K.; “Characterization of the Quartz Photon Intensifying Detector (QUPID) for noble liquid detectors”, *Nuclear Instruments and Methods in Physics Research Section A*, Volume 654, Issue 1, October 2011  
DOI: [10.1016/j.nima.2011.07.015](https://doi.org/10.1016/j.nima.2011.07.015)

Michalet, X.; Colyer, R. A.; Scalia, G.; Kim, T.; Levi, M.; **Aharoni, D.**; Cheng, A.; Guerrieri, F.; Arisaka, K.; Millaud, J.; Rech, I.; Resnati, D.; Marangoni, S.; Gulinatti, A.; Chioni, M.; Tisa, S.; Zappa, F.; Cova, S.; Weiss, S.; “High-throughput single-molecule fluorescence spectroscopy using parallel detection”, *Proc. SPIE*, Volume 7608, January 2010  
DOI: [10.1117/12.846784](https://doi.org/10.1117/12.846784)

Arisaka, K.; Wang, H.; Smith, P. F.; Cline, D.; Teymourian, A.; Brown, E.; Ooi, W.; **Aharoni, D.**; Lam, C. W.; Lung, K.; Davies, S.; Price, M.; “XAX: a multi-ton, multi-target detection system for dark matter, double beta decay, and pp solar neutrinos”, *Astroparticle Physics*, Volume 31, Issue 2, March 2009  
DOI: [10.1016/j.astropartphys.2008.11.007](https://doi.org/10.1016/j.astropartphys.2008.11.007)

#### **Research Papers in Preparation (Research Completed)**

Shuman\*, T.; **Aharoni\***, D.; Cai\*, D. J.; Lee, C.; Chavlis, S.; Taxidis, J.; Flores, S.; Lou, J.; Cheng, K.; Javaherian, M.; Kaba, C.; Bakhurin, K.; Masmanidis, S.; Khakh, B.; Poirazi, P.; Silva, A. J.; Golshani, P.; “Breakdown of spatial coding and neural synchronization in epilepsy”  
DOI: [10.1101/358580](https://doi.org/10.1101/358580)

“An open-source miniature microscopy system for imaging neural activity in freely behaving animals”

“An open-source wire-free miniature microscopy system”