

# NICHOLAS TURNER

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## EDUCATION

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2014 - present **Ph.D. Computer Science** - *Princeton University*

2014 - 2016 **M.A. Computer Science** - *Princeton University*

2007 - 2011 **B.A. Psychology** - *Stanford University*

## PUBLICATIONS

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“Synaptic partner assignment using attentional voxel association networks.”

\* - equal contribution

**Nicholas L. Turner**, Kisuk Lee, Ran Lu, Jingpeng Wu, Dodam Ih, H. Sebastian Seung. *Submitted*.

“Towards community-driven big open brain science.”

Adam S. Charles, Benjamin Falk, **Nicholas Turner**, Talmo D. Pereira, Daniel Tward, Benjamin D. Pedigo, Jaewon Chung, Randal Burns, Satrajit S. Ghosh, Justus M. Kebschull, William Silversmith, Joshua T. Vogelstein. *Submitted*

“Reconstructing neuronal anatomy from whole-brain images.”

James Gornet, Kannan Umadevi Venkataraju, Arun Narasimhan, **Nicholas Turner**, Kisuk Lee, H. Sebastian Seung, Pavel Osten, Uygur Sümbül. *IEEE 16th International Symposium on Biomedical Imaging (ISBI). April, 2019.*

“Convolutional nets for reconstructing neural circuits from brain images acquired by serial section electron microscopy.”

Kisuk Lee\*, **Nicholas L. Turner\***, Thomas Macrina, Jingpeng Wu, Ran Lu, H. Sebastian Seung. *Current Opinion in Neurobiology. Sept, 2018.*

“Digital museum of retinal ganglion cells with dense anatomy and physiology.”

J. Alexander Bae\*, Shang Mu\*, Jinseop S. Kim\*, **Nicholas L. Turner\***, Ignacio Tartavull, Nico Kemnitz, Chris S. Jordan, Alex D. Norton, William M. Silversmith, Rachel Prentki, Marissa Sorek, Celia David, Devon L. Jones, Doug Bland, Amy L. R. Sterling, Jungman Park, Kevin L. Briggman, H. Sebastian Seung, and the Eyewirers. *Cell. May, 2018.*

“Variations in the Williams syndrome GTF2i gene and anxiety-proneness interactively predict DLPFC response to aversive social stimuli in humans.”

Mbemba Jabbi, Qiang Chen, **Nicholas Turner**, Michael White, Jonathan S. Kippenhan, Philip Kohn, Dwight Dickinson, Bhaskar Kolachana, Venkata Mattay, Daniel R. Weinberger, Karen F. Berman. *Translational Psychiatry. Aug, 2015.*

## SOFTWARE SKILLS

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**Strong:** Python - Numpy, Scipy, Pandas, PyTorch, PyMC3, SQLAlchemy, scikit-learn,

**Proficient:** Git, Bash, Docker

**Basic:** R, MATLAB, Julia, C/C++, HTML

## PRESENTATIONS

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“Binary mixture of recurrent synapses between cortical pyramidal neurons.” UW CNC-Allen Institute for Brain Science Connectomics Workshop. *Oct, 2019.*

“Connectomes from human & artificial intelligence - Leveraging artificial intelligence.” Princeton University *Feb, 2019.*

“IARPA MICrONS Phase 2 Site Visit - Synapse detection.” IARPA MICrONS Phase 2 Site Visit. *Feb, 2018.*

“Petascale Neural Circuit Reconstruction - Generating connectomes with 1/100th human effort.” IARPA MICrONS Phase 2 Kick-off. *Jul, 2018.*

“Petascale Neural Circuit Reconstruction - Convolutional networks for neural circuit reconstruction.” IARPA MICrONS Phase 1 Technical Exchange Meeting. *Jan, 2017.*

“MICrONS Phase 1 Site Visit - Synapse detection.” IARPA MICrONS Phase 1 Site Visit. *Jul, 2016.*

“MICrONS Kick-off Team 2 TA3 - Evaluating segmentations.” IARPA MICrONS Phase 1 Kick-off. *Jan, 2016.*

## POSTER PRESENTATIONS

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“Synaptic partner assignment using attentional voxel association networks.”

**Nicholas L. Turner**, Kisuk Lee, Ran Lu, Jingpeng Wu, Dodam Ih, Nico Kemnitz, William Silversmith, William Wong, Ashwin Vishwanathan, Agnes Bodor, Adam Bleckert, Dan Bumbarger, Nuno da Costa, R. Clay Reid, H. Sebastian Seung. HHMI Connectomics Conference. *Apr, 2019.*

“RealNeuralNetworks.jl: A julia package for neuron skeletonization, morphological and connectivity analysis in large scale 3D image segmentation dataset using cloud computing”

Jingpeng Wu, **Nicholas Turner**, Alexander Bae, Ashwin Vishwanathan, H. Sebastian Seung. *5th Annual BRAIN Investigators Meeting. April, 2019.*

“Automated circuit reconstruction for functional connectomics.”

**Nicholas L. Turner**, J. Alexander Bae, Davit Buniatyan, Sven Dorkenwald, Dodam Ih, Nico Kemnitz, Kisuk Lee, Ran Lu, Thomas Macrina, Sergiy Popovych, William Silversmith, Ignacio Tartavull, Jingpeng Wu, William Wong, Jonathan

Zung, Emmanouil Froudarakis, Paul Fahey, Jacob Reimer, Agnes Bodor, Adam Bleckert, Dan Bumbarger, Nuno da Costa, Andreas S. Tolias, R. Clay Reid, H. Sebastian Seung. *Society for Neuroscience (SfN, Poster 219.12). Nov, 2018.*

“Mitochondrial size gradients in cortical neurons suggested by 3D electron microscopy.”

**Nicholas L. Turner**, Runzhe Yang, Agata Foryciarz, Kisuk Lee, William Silversmith, William Wong, Jingpeng Wu, Sven Dorkenwald, T. L. Lewis, Yusuke Hirabayashi, Franck Polleux, Nuno da Costa, R. Clay Reid, H. Sebastian Seung. *Society for Neuroscience (SfN, Poster 430.04). Nov, 2018.*

“Comparing the connectivity fraction for axo-dendritic contacts with pyramidal neuron spiny dendrites and interneuron nonspiny dendrites in mouse V1.”

Thomas Macrina, **Nicholas L. Turner**, Ran Lu, Kisuk Lee, Jingpeng Wu, William Wong, William Silversmith, Nico Kemnitz, Ignacio Tartavull, Jonathan Zung, Davit Buniatyan, Sergiy Popovych, Nuno da Costa, R. Clay Reid, H. Sebastian Seung. *Society for Neuroscience (SfN, Poster 219.13). Nov, 2018.*

“Connectivity patterns of starburst amacrine cells in the mouse retina.”

Shang Mu, **Nicholas L. Turner**, William Silversmith, H. Sebastian Seung, and the Eyewirers. *Society for Neuroscience (SfN, Poster 395.20). Nov, 2018.*

“Digital museum of retinal ganglion cells with dense anatomy and physiology.”

J. Alexander Bae, Shang Mu, Jinseop S. Kim, **Nicholas L. Turner**, Ignacio Tartavull, Nico Kemnitz, Chris S. Jordan, Alex D. Norton, William M. Silversmith, Rachel Prentki, Marissa Sorek, Celia David, Devon L. Jones, Doug Bland, Amy L. R. Sterling, Jungman Park, Kevin L. Briggman, H. Sebastian Seung, and the Eyewirers. *Society for Neuroscience (SfN, Poster 395.13). Nov, 2018.*

“Findings from a mouse retina: starburst amacrine cell contact patterns, ganglion cell On-Off response ratios.”

Shang Mu, **Nicholas L. Turner**, William M. Silversmith, H. Sebastian Seung, and the Eyewirers. *FASEB Conference on Retinal Neurobiology and Visual Processing. June, 2018.*

“Correlation-based parcellation of human intraparietal sulcus with multimodal MRI.”

D. Ellis Hershkowitz, **Nicholas Turner**, J. Shane Kippenhan, Michael D. Gregory, Philip Kohn, Karen F. Berman. *NIH Summer Poster Day. Aug, 2013.*

“White matter microstructure in children with Williams syndrome compared to matched controls,”

**Nicholas L. Turner**, Katherine Roe, Dharshan Chandramohan, Melanie Sottile, Daniel Rubinstein, Joelle Sarlls, Carolyn Mervis, Joseph Masdeu, Daniel Eisenberg, Jeffrey Bloch, Katherine Damme, Jonathan Kippenhan, Stefano Marengo, Karen F. Berman. *Organization for Human Brain Mapping (OHBM, Poster 3543). Jun, 2013.*

## TEACHING EXPERIENCE

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**Assistant in Instruction** - Advanced Programming Techniques, *Princeton University, 2016*

**Assistant in Instruction** - Functional Programming, *Princeton University, 2015*

**Teaching Assistant** - Introduction to Statistical Methods: Precalculus, *Stanford University, 2011*

**Teaching Assistant** - Intro to Psychology, *Stanford University, 2019-2010*

## HONORS AND AWARDS

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**NIH Post-baccalaureate Intramural Research Training Award Fellow** *2011-2014*