

# Srinivas Gorur-Shandilya

Computational Neuroscientist at Inscopix Inc.

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## Education

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| 2017 | Ph.D. in Neuroscience<br>Yale University, USA  |
| 2010 | M.Sc. in Neuroscience<br>Georg-August-Universität Göttingen, Germany                             |
| 2008 | B.Sc. in Physics, Chemistry and Mathematics<br>St. Stephen's College, University of Delhi, India |

## Research Positions

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| 2018–2021 | NRSA Postdoctoral Fellow, Brandeis University, USA<br>Advisor: Eve Marder  |
| 2017–2018 | Postdoctoral Associate, Brandeis University, USA<br>Advisor: Eve Marder  |
| 2010–2017 | Doctoral student at Yale University, USA<br>Advisor: Thierry Emonet  |
| 2009–2010 | Research Fellow at the Max Planck Institute for Nonlinear Dynamics<br>and Self-Organisation, Göttingen, Germany<br>Advisor: Marc Timme |

## Professional Activities and Awards

ad-hoc reviewer for: *Scientific Reports, New Journal of Physics, Brain Sciences, Europhysics Letters and Frontiers in Neural Circuits*

- 2019 Accepted into the Junior Scientist Workshop on Theoretical Neuroscience, Howard Hughes Medical Institute, USA
- 2018 Named Distinguished Referee by the European Physical Society
- 2016 Presenters' Travel Grant, Cosyne, USA
- 2015 Conference Travel Fellowship, Graduate Student Assembly, Yale University, USA
- 2011–2013 Anne S. And William H. Macmillan Fellowship, Yale University, USA
- 2012 Editor's selection in "Highlights of 2011" for first-author paper in *New Journal of Physics*
- 2009–2010 Research Fellowship, Max Plank Society, Germany
- 2008–2009 Fellowship from the Excellence Foundation for the Promotion of the Max Planck Society, Max Planck Society.  
*Tuition and living expenses at the University of Göttingen, Germany. One of 10 Fellows selected by worldwide competition.*
- 2005–2008 KVPY Fellowship, The Department of Science and Technology, India.  
*One of 89 Fellows selected by nationwide competition out of ~100,000 applicants.*

## Peer-reviewed Publications

up to date list at <https://srinivas.gs/publications/>

- 2021 Powell, D.<sup>†</sup>, Haddad, S.<sup>†</sup>, **Gorur-Shandilya, S.<sup>†</sup>**, & Marder E. Coupling between fast and slow oscillator circuits in *Cancer borealis* is temperature compensated. *eLife* 10: e60454. († = equal contribution)
- 2020 **Gorur-Shandilya, S.**, Marder, E. & O'Leary, T. Activity-dependent compensation of cell size is vulnerable to targeted deletion of ion channels. *Scientific Reports* 10, 15989
- 2019 **Gorur-Shandilya, S.**, Martelli, C., Demir, M., & Emonet, T. Controlling and measuring dynamic odorant stimuli in the laboratory. *Journal of Experimental Biology*, 222(23), 207787

- 2018 **Gorur-Shandilya, S.<sup>†</sup>**, Hoyland, A.<sup>†</sup>, & Marder, E. Xolotl: an intuitive and approachable neuron and network simulator for research and teaching. *Frontiers in neuroinformatics*, 12(87) († = equal contribution)
- 2018 Bronk, P., Kuklin, E. A., **Gorur-Shandilya, S.**, Liu, C., Wiggin, T. D., Reed, M. L., Marder, E. & Griffith, L. C. Regulation of EAG by Ca<sup>2+</sup>/calmodulin controls presynaptic excitability in *Drosophila*. *Journal of neurophysiology*, 119(5):1665-1680.
- 2017 **Gorur-Shandilya, S.<sup>†</sup>**, Demir, M.<sup>†</sup>, Long, J., Clark, D. A., & Emonet, T. Olfactory receptor neurons use gain control and complementary kinetics to encode intermittent odorant stimuli. *eLife*, 6, e27670 († = equal contribution)
- 2016 Raccuglia, D., McCurdy, L. Y., Demir, M., **Gorur-Shandilya, S.**, Kunst, M., Emonet, T., & Nitabach, M. N. Presynaptic GABA receptors mediate temporal contrast enhancement in *Drosophila* olfactory sensory neurons and modulate odor-driven behavioral kinetics. *ENeuro*, 3(4)
- 2014 Koh, T. W., He, Z., **Gorur-Shandilya, S.**, Menuz, K., Larter, N. K., Stewart, S., & Carlson, J. R. The *Drosophila* IR20a clade of ionotropic receptors are candidate taste and pheromone receptors. *Neuron*, 83(4):850-865  
200+ citations
- 2011 **Shandilya, S. G.**, & Timme, M. Inferring network topology from complex dynamics. *New Journal of Physics*, 13(1), 013004  
150+ citations

## Extramural Talks and Public Lectures

- 2021 “Mapping the structure of circuit dynamics during function and dysfunction”. invited talk at Google Connectomics
- 2021 “Mapping the structure of circuit dynamics during function and dysfunction”. job talk at Inscopix, Inc.
- 2020 “Modeling and visualizing neural circuit dynamics”. job talk at Harvard Research Computing
- 2020 “Mapping the structure of circuit dynamics during function and dysfunction”. Annual meeting of the Stomatogastric Ganglion.
- 2020 “Mapping the structure of circuit dynamics during function and dysfunction”. Accepted talk at the Simons Collaboration on the Global Brain, Boston, USA.
- 2019 “The self-tuning neuron: how homeostasis can compensate for size changes”. Invited talk at the Physics of Living Systems Seminar Series, MIT, USA.
- 2019 “Homeostasis in neuron models and implications for size compensation”. Invited seminar at the Allen Center for Discovery, Tufts University, USA.

- 2016 “Sequential gain control in *Drosophila* olfactory receptor neurons.” Accepted talk at Sense2Synapse, New York, USA.
- 2015 “Topology Predicts Dynamics; Dynamics Constrain Topology.” Invited talk at SIAM Conference on Applications of Dynamical Systems (DS15), Snowbird, USA.
- 2013 “Why is anything the way it is?” Accepted lightning talk at the 30<sup>th</sup> Chaos Communication Congress (30C3), Hamburg, Germany.

## Additional Training

- 2018 1 of 20 accepted into the Quantitative Approaches to Behavior Summer School under the Cajal Advanced Neuroscience Training Program, Lisbon, Portugal
- 2019 Accepted into the Junior Scientist Workshop on Theoretical Neuroscience, Howard Hughes Medical Institute, USA

## Teaching and Mentorship

### TEACHING

- 2021 Instructor at the Brandeis Quantitative Biology Research Community  
*designed curriculum and software for a 12-week research program for undergraduates and taught 3-hr classes a week. Mentored four undergraduates.*  
[brandeis.edu/qbrec/](http://brandeis.edu/qbrec/)
- 2020 Visual Display of Quantitative Information Workshop, Brandeis University  
*created and ran a workshop on best practices in the visual display of data*  
[brandeis.edu/science-communications-lab/workshops](http://brandeis.edu/science-communications-lab/workshops)
- 2020 Developed custom pedagogical software for NBIO140, Brandeis University, together with Prof. Steven van Hooser
- 2019-2021 Fellow at the Scientific Communication Laboratory, Brandeis University.  
*Train scientists (at all stages: undergraduate - faculty) in one-on-one sessions to improve written and oral presentations.*  
[brandeis.edu/science-communications-lab/commlab-fellows](http://brandeis.edu/science-communications-lab/commlab-fellows)
- 2019 Guest lecturer, NBIO 148, Brandeis University, for Prof. Sacha Nelson  
*created custom software for students to interactively manipulate neurons and taught a class on the principles of the Hodgkin-Huxley model in neuroscience*
- 2015 Organized and taught a workshop on encryption and cryptography at the Center for Engineering Innovation and Design, Yale University.
- 2014 Teaching Fellow for Dynamical Systems in Biology (MCDB 361) at Yale University, taught by Profs. Emonet, Clark and Howard.

2010 Teaching Fellow for Neurobiology (MCDB 320a) at Yale University, taught by Profs. Keshishian and Forscher.

#### MENTORSHIP

2019–2020 Robert Tromm, B.Sc. student, Brandeis University.

2017–2018 Alec Hoyland, M.Sc. student, Brandeis University.

## Selected Projects & Code

#### OPEN SOURCE SOFTWARE

**xolotl** a fast and easy-to-use neuron and network simulator  
[github.com/sg-s/xolotl](https://github.com/sg-s/xolotl)

**crabsort** a general-purpose multi-channel extracellular spike sorter that uses neural nets to classify spikes and active learning to update predictions  
[github.com/sg-s/crabsort](https://github.com/sg-s/crabsort)

**condalab** transparent interface to use Anaconda from within MATLAB  
[github.com/sg-s/condalab](https://github.com/sg-s/condalab)

**cpplab** toolbox that allows C++ classes to be natively used in MATLAB  
[github.com/sg-s/cpplab](https://github.com/sg-s/cpplab)

**puppeteer** MATLAB class to interactively manipulate functions and classes  
[github.com/sg-s/puppeteer](https://github.com/sg-s/puppeteer)

#### PROGRAMMING LANGUAGES

**MATLAB** 15+ years, 68,000+ lines of code  
*parallelism, OOP, toolbox development, mex & C++ interfaces.*

**C++** 10+ years, 19,000+ lines of code  
*multi-threading, OOP, templates*

**Python** 7+ years, 15,000+ lines of code  
*OOP, toolbox development, pandas, numpy, bokeh*

**Julia** 2+ years, 1000+ lines of code

**Swift** 1+ year, 1000+ lines of code

*Other projects and code available at [github.com/sg-s/](https://github.com/sg-s/)*

## References

Eve Marder, PhD

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Thierry Emonet, PhD

[thierry.emonet@yale.edu](mailto:thierry.emonet@yale.edu)

Damon A. Clark, PhD

[damon.clark@yale.edu](mailto:damon.clark@yale.edu)