

Hannah Choi

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Address: Georgia Institute of Technology
School of Mathematics
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Atlanta, GA 30332-0160 USA

EDUCATION

Northwestern University Ph.D. in Applied Mathematics	Evanston, IL September 2014
<i>Thesis title:</i> Modeling of Oscillations and Bursting in Retinal AII Amacrine Cells <i>Advisors:</i> Hermann Riecke, Ph.D. and William Kath, Ph.D.	
Northwestern University M.S. in Applied Mathematics (en route)	Evanston, IL June 2010
University of California, Berkeley B.A. in Applied Mathematics	Berkeley, CA December 2007

RESEARCH & ACADEMIC POSITIONS

Assistant Professor School of Mathematics Georgia Institute of Technology, Atlanta, GA	January 2021– Present
Visiting Scientist Allen Institute for Brain Science, Seattle, WA	June 2017 – December 2020
Postdoctoral Fellow Department of Applied Mathematics University of Washington, Seattle, WA <i>Advisors:</i> Eric Shea-Brown, Ph.D. and Stefan Mihalas, Ph.D.	June 2017– December 2020
Simons Berkeley Research Fellow Simons Institute for the Theory of Computing University of California, Berkeley, CA <i>(Awarded a semester-long fellowship for "The Brain and Computation" program)</i>	January 2018 – May 2018
Washington Research Foundation Innovation Postdoctoral Fellow in Neuroengineering Department of Applied Mathematics, Department of Biological Structure, and Institute for Neuroengineering University of Washington, Seattle, WA <i>Advisors:</i> Eric Shea-Brown, Ph.D., Wyeth Bair, Ph.D., Anitha Pasupathy, Ph.D.	December 2014 – June 2017

AWARDS & GRANTS

Major Awards and Grants

■ Current

Alfred P. Sloan Research Fellowship (2022-2024)
Alfred P. Sloan Foundation

NIH K99/R00 BRAIN Initiative Career Transition Award (2019-2023)*National Institutes of Health (NIH)*

- K99/R00 EY030840
- Title: Bridging structure, dynamics, and information processing in brain networks
- Role: PI & Awardee

■ **Completed****Patrick J McGovern Research Fellowship + Simons-Berkeley Research Fellowship (Spring 2018)***Simons Institute for the Theory of Computing, University of California, Berkeley*

- Research fellowship for the semester-long program “The Brain and Computation” at the Simons Institute for the Theory of Computing, University of California, Berkeley

Washington Research Foundation (WRF) Innovation Postdoctoral Fellowship (2014-2017)*Washington Research Foundation & University of Washington Institute for Neuroengineering***Walter P. Murphy Fellowship (2009-2010)***Northwestern University***Summer Integrative Cancer Biology Program (ICBP) Fellowship (2007)***National Cancer Institute (NCI)****Selected Smaller Awards***

- **Cosyne Presenters Travel Grant (2018)**
- **Modeling Neural Activity (MONA2) Conference Travel Award (2016)**
- **Conference Travel Grant (2013), *The Graduate School, Northwestern University***
- **National Society of Collegiate Scholars (2004)**

Competitively Allocated Resources**Allen Institute for Brain Science, OpenScope (2018)**

Testing Models of Predictive Coding in Mouse Visual Cortex

Role: Co-PI with Marina Garrett, Nicholas Cain, and Rylan Larsen

*This is a collaborative project

PUBLICATIONS***Publications in preparation***

“Testing models of predictive coding in mouse visual cortex”, in preparation, with Marina Garrett, Nicholas Cain, Rylan Larsen., David Wyrick, Luca Mazzucato, and Jerome Lecoq

Journal Publications

2021, J.H. Siegle^{*,†}, X. Jia^{*,†}, S. Durand, S. Gale, C. Bennett, N. Graddis, G. Heller, T. Ramirez, **H. Choi**, J.A. Luviano, ..., S.R. Olsen^{*,††}, C. Koch^{††}, “Survey of spiking in the mouse visual system reveals functional hierarchy”, *Nature* 592:86–92

DOI: [10.1038/s41586-020-03171-x](https://doi.org/10.1038/s41586-020-03171-x)Preprint version (2019): *bioRxiv*: doi.org/10.1101/805010

2019, J.A. Harris^{*,†}, S. Mihalas[†], K.E. Hirokawa, J.D. Whitesell, **H. Choi**, ..., C. Koch, H. Zeng, “Hierarchical organization of cortical and thalamic connectivity”, *Nature* 575:195-202

DOI: [10.1038/s41586-019-1716-z](https://doi.org/10.1038/s41586-019-1716-z)

- 2019, **H. Choi***, S. Mihalas, “Synchronization dependent on spatial structures of a mesoscopic whole-brain network”, *PLoS Computational Biology* 15(4): e1006978
DOI: [10.1371/journal.pcbi.1006978](https://doi.org/10.1371/journal.pcbi.1006978)
Preprint version (2018): [bioRxiv: dx.doi.org/10.1101/319830](https://doi.org/10.1101/319830)
- 2018, **H. Choi***, A. Pasupathy, E. Shea-Brown, “Predictive coding in area V4: dynamical shape discrimination under partial occlusion”, *Neural Computation* 30(5):1209–1257 [**Featured cover article**]
DOI: [10.1162/neco_a_01072](https://doi.org/10.1162/neco_a_01072)
Preprint version (2016): [arXiv:1612.05321 \[q-Bio.NC\]](https://arxiv.org/abs/1612.05321) & [PubMed version \(2018\)](#)
- 2017, A.M. Fyall⁺, Y. El-Shamayleh⁺, **H. Choi**, E. Shea-Brown, A. Pasupathy*, “Dynamic representation of partially occluded objects in primate prefrontal and visual cortex”, *eLife* 6:e25784
DOI: [10.7554/eLife.25784](https://doi.org/10.7554/eLife.25784)
- 2014, **H. Choi**, L. Zhang, M.S. Cembrowski, C.F. Sabottke, A.L. Markowitz, D.A. Butts, W.L. Kath, J.H. Singer*, and H. Rieke*, “Intrinsic bursting of AII amacrine cells underlies oscillations in rd1 mouse retina”, *Journal of Neurophysiology* 112: 1491-1504
DOI: [10.1152/jn.00437.2014](https://doi.org/10.1152/jn.00437.2014)
- 2010, W-S. Jung, K.S. Lee, J.S. Park, **H. Choi**, M.Y. Choi*, “Sleepless in Seoul: The Ant and the Metrohopper”, *Journal of the Korean Physical Society* 57(4):823
DOI: [10.3938/jkps.57.823](https://doi.org/10.3938/jkps.57.823)
Preprint version (2010): [arXiv:1010.1165](https://arxiv.org/abs/1010.1165)
- 2010, M.Y. Choi*, **H. Choi**, J.-Y. Fortin, J. Choi, “Reply to the comment by A. Gadomski”, *Europhysics Letter* 89: 40003
DOI: [10.1209/0295-5075/89/40003](https://doi.org/10.1209/0295-5075/89/40003)
- 2009, M.Y. Choi*, **H. Choi**, J.-Y. Fortin, J. Choi, “How skew distributions emerge in evolving systems”, *Europhysics Letter* 85: 30006
DOI: [10.1209/0295-5075/85/30006](https://doi.org/10.1209/0295-5075/85/30006)

Peer-reviewed Conference Proceedings

- 2022, D. Wyrick, **H. Choi**, M. Garrett, L. Mazzucato, N. Cain, R. Larsen, M. Valley, J. Lecoq, "Differential encoding of temporal context and expectation across the visual hierarchy" *Cosyne Abstracts 2022*, Lisbon, Portugal
- 2020, **H. Choi**, M. Garrett, R. Larsen, N. Cain, "Unraveling the neural circuitry of predictive coding in mouse visual cortex" *Cosyne Abstracts 2020*, Denver USA
- 2020, **H. Choi**, “Data-Driven Models of the Mouse Mesoscale Connectome: Network Structure and Functionality” as part of session “Physical-Based Modeling and Machine Learning for Biological and Environmental Sciences” with M. Zahr, F. Xia, K. Champion, J. Z. Bai, and Z. Xu, *SIAM Conference on Parallel Processing for Scientific Computing 2020*, Seattle USA
- 2019, **H. Choi**, “Network structure and dynamics of a mesoscopic mouse whole-brain connectome” as part of Minisymposium “Artificial Intelligence and Neuroscience: From Neural Dynamics to Artificial Agents” with M. Sahani, O. Costilla Reyes, L. Duncker, J. Glaser, A. Nayebi, and A. Banino, *Society for Neuroscience 2019*, Chicago USA
- 2018, **H. Choi**, S. Mihalas, “Spatially constrained model of a mesoscopic whole-brain connectivity: insights from network dynamics”, *Cosyne Abstracts 2018*, Denver USA

2017, **H. Choi**, A. Pasupathy, E. Shea-Brown, “Predictive coding in area V4 as a mechanism for recognition of partially occluded shapes”, *Cosyne Abstracts 2017*, Salt Lake City USA

2016, **H. Choi**, A. Pasupathy, E. Shea-Brown, “Predictive coding in area V4 and prefrontal cortex explains dynamic discrimination of partially occluded shapes”, *BMC Neuroscience*, 17 (Supple 1): P64
DOI: [10.1186/s12868-016-0283-6](https://doi.org/10.1186/s12868-016-0283-6)

2015, **H. Choi**, A. Khachatryan, C. LePre, E. Kaplan, Q. Zaidi, Y. Xiao, “Neural circuitry of brightness induction: modeling and physiology”, *Journal of Vision* 15(12):638
DOI: [10.1167/15.12.638](https://doi.org/10.1167/15.12.638)

2013, H. Riecke, **H. Choi**, M.S. Cembrowski, W.L. Kath, J.H. Singer, “Spikelets and bursts in axonless retinal AII amacrine cells coupled by gap junctions”, *BMC Neuroscience*, 14 (Supple 1): 364
DOI: [10.1186/1471-2202-14-S1-P364](https://doi.org/10.1186/1471-2202-14-S1-P364)

2013, H. Riecke, **H. Choi**, W.L. Kath, M.S. Cembrowski, J.H. Singer, “Spiking and bursting in gap-junction coupled axonless retinal amacrine cells”, *The 8th IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory*

Theses

2014, **H. Choi**, “Modeling of Oscillations and Bursting in Retinal AII Amacrine Cells”, PhD Thesis, Department of Engineering Sciences and Applied Mathematics, Northwestern University 

* indicates corresponding author.

+,++ indicate equal contribution.

RESEARCH PRESENTATIONS

Invited Talks and Oral Presentations

“Linking structure and computation of data-driven brain networks”, *2022 Georgia Scientific Computing Symposium*, Georgia Institute of Technology, Atlanta, GA. February 19, 2022 (Invited)

“Hierarchical structure and computation of multi-regional mouse cortical networks”, *Dynamical Principles of Biological and Artificial Neural Networks (Online)*, Banff International Research Station for Mathematical Innovation and Discovery, Banff, AB., Canada. January 10, 2022 (Invited, Virtual)

“Linking Structure and Computation of Data-driven Brain Networks”, *Biological Sciences Seminar*, School of Biological Sciences, Georgia Institute of Technology, Atlanta, GA. November 18, 2021 (Invited)

“Structure and computation of data-driven brain networks”, *Research Horizons*, School of Mathematics, Georgia Institute of Technology, Atlanta, GA. October 13, 2021 (Invited)

“Linking structure and computation of data-driven brain networks”, *Georgia Tech QBioS Summer Share*, Georgia Institute of Technology, Atlanta, GA. June 4, 2021 (Invited, Virtual)

“Hierarchical structure and computation of data-driven neuronal networks”, *Georgia Tech Neuro Seminar Series*, Georgia Institute of Technology, Atlanta, GA. April 5, 2021 (Invited, Virtual)

“Hierarchical structure and computation of data-driven neuronal networks”, *Mathematical Biology Seminars*, School of Mathematics, Georgia Institute of Technology, Atlanta, GA. March 19, 2021 (Invited, Virtual)

“Hierarchical structure and computation of brain networks”, *Mathematics Colloquia and Seminars*, Department of Mathematics, University of California, Davis, CA. April 27, 2020 (Invited, Virtual)

- “Data-Driven Models of the Mouse Mesoscale Connectome: Network Structure and Functionality” as part of session “Physical-Based Modeling and Machine Learning for Biological and Environmental Sciences”, *SIAM Conference on Parallel Processing for Scientific Computing*, Seattle, WA. February 12-15, 2020.
- “Hierarchical structure and computation of brain networks”, Department of Neuroscience, Washington University School of Medicine, St. Louis, MO. Feb 10, 2020 (Invited)
- “Hierarchical structure and computation of brain networks”, Division of Biological Sciences and Halicioğlu Data Science Institute, University of California, San Diego, CA. Jan 21, 2020 (Invited)
- “Hierarchical structure and computation of brain networks”, Department of Mathematics, Boston University, Boston, MA. Jan 14, 2020 (Invited)
- “Hierarchical structure and computation of brain networks”, Departments of Mathematics & Biology, University of Oregon, Eugene, OR. Dec 12, 2019 (Invited)
- “Inferring computation from structure in neuronal networks”, School of Mathematics, Georgia Institute of Technology, Atlanta, GA. Dec 5, 2019 (Invited)
- “OpenScope: a community-driven brain observatory”, Team Talk with Jerome Lecoq, Yazan Billeh, Josh Larkin and Joel Zylberberg. *Allen Institute Showcase*, Allen Institute for Brain Science, Seattle, WA. November 12, 2019
- “Network structure and dynamics of a mesoscopic mouse whole-brain connectome” as part of Minisymposium “Artificial Intelligence and Neuroscience: From Neural Dynamics to Artificial Agents” with Maneesh Sahani, Omar Costilla Reyes, Lea Duncker, Joshua Glaser, Aran Nayebi, and Andrea Banino. *Society for Neuroscience (SfN)*, Chicago, IL. October 19-23, 2019
- “Data-driven models of the mouse mesoscale connectome: network structure and functionality”, Course: Modeling the brain and its pathologies, *International School of Brain Cells & Circuits “Camillo Golgi”*, Ettore Majorana Foundation and Centre for Scientific Culture, Erice, Italy. August 27- September 1, 2019 (Invited)
- “Inferring functionality form network structure of the mouse mesoscale connectome”, *The Brain and Computation Reunion Workshop*, Simons Institute for the Theory of Computing, University of California, Berkeley, CA. June 17, 2019 (Invited)
- “Bridging structure and computation of brain networks at multiple scales”, Gatsby Computational Neuroscience Unit, University College London, London, United Kingdom. May 23, 2019 (Invited)
- “Bridging structure and computation of brain networks at multiple scales”, Department of Biomedical Engineering, University of Southern California, Los Angeles, CA. May 6, 2019 (Invited)
- “Bridging structure, dynamics, and computation in brain networks”, Department of Computer Science, University of California, Santa Barbara, CA. January 17, 2019 (Invited)
- “Bridging structure, dynamics, and computation in brain networks”, Department of Mathematics, University of Pittsburgh, Pittsburgh, PA. December 6, 2018 (Invited)
- “The Mouse Mesoscale Connectome: Data-driven Models and Organization of Cortical Networks”, Team Talk with Julie Harris, Jennifer Whitesell, Stefan Mihalas, and Kameron Harris. *Allen Institute Showcase*, Allen Institute for Brain Science, Seattle, WA. December 4, 2018
- “Bridging structure, dynamics, and computation in brain networks”, Department of Cell Biology & Anatomy and Hotchkiss Brain Institute, University of Calgary, Calgary, Alberta, Canada. November 8, 2018 (Invited)

"Predictive coding in visual cortical area V4", *Brain & Computation Seminar*, Simons Institute for the Theory of Computing, University of California, Berkeley, CA. April 4, 2018.

"Predictive coding in visual cortical area V4 as a mechanism for shape discrimination under partial occlusion", *Swartz Meeting*, Janelia Research Campus, Ashburn, VA. July 23-26, 2017 (Invited)

"Predictive coding in visual cortical area V4: a mechanism for shape recognition under partial occlusion", *Brain Dynamics on Multiple Scales - Paradigms, their Relations, and Integrated Approaches (International Workshop)*, Max-Planck Institute for Physics of Complex Systems, Dresden, Germany. June 19-23, 2017

"Predictive coding explains discrimination of occluded shapes in an intermediate visual cortical area", *Applied Mathematics Thursday Seminars*, University of Washington, Seattle, WA. May 19, 2016 (Invited)

"Dynamical shape discrimination in visual and frontal cortex", *Neural Computation and Engineering Connection*, University of Washington, Seattle, WA. January 29, 2016 (Invited)

"Modeling of oscillations and bursting in retinal AII amacrine cells", *SUNY Eye Institute 6th Annual Meeting*, Syracuse, NY. September 27-28, 2014 (Invited)

"Intrinsically bursting AII amacrine cells drive oscillations in the degenerated rd1 retina", Mini-symposium presentation, *SIAM Annual Meeting*, Chicago, IL. July 7-11, 2014

"Bursting and oscillations in retinal AII amacrine cells", *Chicago Area SIAM Student Conference*, Evanston, IL, April 5, 2014 (Invited)

Poster Presentations

N. Cain, **H. Choi**, M. Garrett, R. Larsen, J. Lecoq, L. Mazzucato, M. Valley, D. Wyrick, "Neural circuitry of predictive coding in mouse visual cortex", The 7th Annual BRAIN Initiative Investigators Meeting, June 15-17, 2021 (Virtual)

H. Choi, S. Mihalas, E. Shea-Brown, "Linking structure and computation in mouse cortical network", The 6th Annual BRAIN Initiative Investigators Meeting, June 1-2, 2020 (Virtual)

H. Choi, M. Garrett, R. Larsen, N. Cain, "Unraveling the neural circuitry of predictive coding in mouse visual cortex" *Computational and Systems Neuroscience (Cosyne) Meeting*, Denver, CO. February 27-March 1, 2020

H. Choi, K.E. Hirokawa, J.D. Whitesell, N. Graddis, C. Koch, H. Zeng, J.A. Harris, S. Mihalas, "Unsupervised construction of a data-driven cortical hierarchy in mouse", *Society for Neuroscience (SfN) Annual Meeting*, Chicago, IL. October 19-23, 2019

H. Choi, I. Magrans de Abril, B. Hu, S. Mihalas, "Uncovering network generation rules from large scale connectivity measurements", *Society for Neuroscience (SfN) Annual Meeting*, Chicago, IL. October 19-23, 2019

H. Choi, K.E. Hirokawa, J.D. Whitesell, N. Graddis, C. Koch, H. Zeng, J.A. Harris, S. Mihalas, "Unsupervised construction of a data-driven cortical hierarchy in mouse", *Swartz Meeting*, Janelia Research Campus, Ashburn, VA. July 21-24, 2019

H. Choi, S. Mihalas, "Spatially constrained model of a mesoscopic whole-brain connectivity: insights from network dynamics", *Computational and Systems Neuroscience (Cosyne) Meeting*, Denver, CO. March 1-4, 2018

H. Choi, A. Pasupathy, E. Shea-Brown, "Predictive coding in area V4 as a mechanism for recognition of partially occluded shapes", *Computational and Systems Neuroscience (Cosyne) Meeting*, Salt Lake City, UT. February 23-26, 2017

- H. Choi**, A. Pasupathy, E. Shea-Brown, “Predictive coding in area V4 and prefrontal cortex explains dynamic discrimination of partially occluded shapes”, *Computational Neurosciences (CNS) Meeting*, Jeju, South Korea. July 2-7, 2016
- H. Choi**, A. Pasupathy, E. Shea-Brown, “Predictive coding in area V4: dynamic discrimination of partially occluded shapes”, *Modeling Neural Activity (MONA2) Meeting*, Waikoloa, HI. June 22-24, 2016
- H. Choi**, A. Fyall, E. Shea-Brown, A. Pasupathy, “Neural mechanisms of shape discrimination under partial occlusion: a circuit model of V4 and prefrontal cortex”, *Society for Neuroscience (SfN) Annual Meeting*, Chicago, IL. October 20, 2015
- H. Choi**, A. Fyall, E. Shea-Brown, A. Pasupathy, “Shape discrimination under partial occlusion: a dynamical model of V4-prefrontal cortex network”, *Computational Vision Summer School (CVSS)*, Freudenstadt, Germany. July 28-August 4, 2015
- H. Choi**, A. Khachatryan, C. LePre, E. Kaplan, Q. Zaidi, Y. Xiao, “Neural circuitry of brightness induction: modeling and physiology”, *Vision Science Society (VSS) Annual Meeting*, St. Pete Beach, FL. May 17, 2015
- H. Choi**, M.S. Cembrowski, J.H. Singer, W.L. Kath, H. Rieke, “Intrinsically bursting AII amacrine cells drive oscillations both in wildtype and rd1 retina”, *Society for Neuroscience (SfN) Meeting*, San Diego, CA. Nov 13-15, 2013
- H. Choi**, L.M. Heiser, P. T. Spellman, “Firefly analysis of 51 breast cancer cell lines”, *NCI Integrative Cancer Biology Program Steering Committee Meeting*, Washington DC. November 13-14, 2007

Contributed Presentations

- D. Wyrick, **H. Choi**, M. Garrett, L. Mazzucato, N. Cain, R. Larsen, M. Valley, J. Lecoq, "Differential encoding of temporal context and expectation across the visual hierarchy" *Computational and Systems Neuroscience (Cosyne) Meeting*, Lisbon, Portugal. March 17-20, 2022
- J.H. Siegle, X. Jia, ... **H. Choi**, ... S.R. Olsen, C. Koch, “A large-scale, standardized survey of spiking activity across the mouse visual system”, *Society for Neuroscience (SfN) Meeting*, Chicago, IL. October 19-23, 2019
- A. Fyall, **H. Choi**, E. Shea-Brown, A. Pasupathy, “Primate prefrontal cortex and the representation of partially occluded shapes”, *Society for Neuroscience (SfN) Meeting*, San Diego, CA. November 12-16, 2016
- A. Pasupathy, A. Fyall, **H. Choi**, “Discriminating partially occluded shapes: insights from visual and frontal cortex”, *Computational and Systems Neuroscience (Cosyne) Meeting*, Salt Lake City, UT. March 5-8, 2015
- H. Rieke, **H. Choi**, L. Zhang, M.S. Cembrowski, W.L. Kath, J.H. Singer, “Intrinsic bursting of AII amacrine cells underlies oscillations in the rd1 mouse retina”, *Nonlinear dynamics and stochastic methods: from neuroscience to other biological applications*, Pittsburgh, PA. March 10-12, 2014
- H. Rieke, **H. Choi**, M.S. Cembrowski, W.L. Kath, J.H. Singer, “Spikelets and bursts in axonless retinal AII amacrine cells coupled by gap junctions”, *Computational Neurosciences (CNS) Meeting*, Paris, France July 13-18, 2013
- H. Choi**, M.S. Cembrowski, L. Zhang, W.L. Kath, H. Rieke, J. Demb, J.H. Singer, “Intrinsic bursting and oscillations in the rod pathway of the retina”, *Collaborative Research in Computation Neuroscience (CRCNS) PI Meeting 2013*, Cambridge, MA. June 9- June 11, 2013
- H. Rieke, **H. Choi**, W.L. Kath, M.S. Cembrowski, J.H. Singer, “Spiking and bursting in gap-junction coupled axonless retinal amacrine cells”, *Waves*, University of Georgia, Athens, Georgia. March 25-28, 2013 (Talk)

PRESS COVERAGE

- “[Allen Institute maps out a high-resolution ‘org chart’ for connections in the brain](#)”, GeekWire. October 30, 2019.
- “[A model for how the brain stays in sync](#)”, May 28, 2019.
- “[OpenScope: The First Shared Observatory for Neuroscience](#)”, July 26, 2018.
- “[OpenScope gives neuroscientists time on Allen Institute’s telescope for the brain](#)”, GeekWire. July 26, 2018.
- “[Brain at work: spotting half-hidden objects](#)”, September 19, 2017.

SUMMER COURSES

Computational Vision Summer School Bernstein Center for Computational Neuroscience Tübingen	July 28- August 4, 2015 Freudenstadt, Germany
Berkeley summer course in mining and modeling of neuroscience data Redwood Center for Theoretical Neuroscience, UC Berkeley	July 6-17, 2015 Berkeley, CA

RESEARCH ADVISING

Postdocs

Farshad Shirani, Postdoc in the School of Mathematics (July 2021 - Present)
Georgia Institute of Technology, Atlanta, GA

Soon Ho Kim, Postdoc in the School of Mathematics (January 2022 - Present)
Georgia Institute of Technology, Atlanta, GA

Graduate Students

Aishwarya Balwani, PhD student in Electrical & Computer Engineering (May 2021 - Present)
Co-advised with Chris Rozell
Georgia Institute of Technology, Atlanta, GA

Disheng Tang, PhD student in Quantitative Biosciences (May 2021 - Present)
Georgia Institute of Technology, Atlanta, GA

Abdelrahman Sharafeldin, PhD student in Machine Learning (August 2021 - Present)
Co-advised with Nabil Imam
Georgia Institute of Technology, Atlanta, GA

Zachary Mobbille (rotation), PhD student in Quantitative Biosciences (January 2022 - Present)
Georgia Institute of Technology, Atlanta, GA

Undergraduate Students

Richard Snell, undergraduate major in Applied and Computational Mathematical Sciences
AMATH 499 Undergraduate Reading and Research Course Advisor (March 2017 - June 2017)
University of Washington, Seattle, WA

Suhee Cho, undergraduate visiting student from KAIST, major in Bio & Brain Engineering
MATH 4699 Undergraduate Research Course Advisor (January 2022 - Present)
Georgia Institute of Technology, Atlanta, GA

PhD Committee Member

Joy Putney (QBioS PhD, 2021; Advisor: Simon Sponberg; Georgia Institute of Technology)

TEACHING EXPERIENCE

Graduate & Undergraduate Courses

Instructor

Georgia Institute of Technology

School of Mathematics

• Courses:

- MATH 1552 Integral Calculus (undergraduate level)
- MATH 4320 Complex Analysis (undergraduate level)

Atlanta, GA

Spring 2021

Spring 2022

University of Washington

Department of Applied Mathematics

• Courses:

- AMATH 402/502 Introduction to Dynamical Systems and Chaos (undergraduate & graduate levels)
- AMATH 575 Dynamical Systems (graduate level)

Seattle, WA

January 2017 - June 2017

Teaching Assistant

Northwestern University

Department of Mathematics

• Courses:

- MATH 224 Integral Calculus of One Variable Functions
- MATH 230 Differential Calculus of Multivariable Functions
- MATH 234 Multiple Integration and Vector Calculus
- MATH 381 Fourier Analysis and Boundary Value Problems (undergraduate level)

Evanston, IL

September 2010 - June 2012,

September 2013 - June 2014

Department of Engineering Sciences and Applied Mathematics

• Courses:

- Engineering Analysis 4 - Differential Equations and Boundary Value Problems: computing and modeling
- MATH 234 Multiple Integration and Vector Calculus (undergraduate level)

September 2012 - June 2013

Drop-in Physics Tutor

University of California, Berkeley

Student Learning Center

- Tutored at academic help sessions for undergraduates in introductory physics courses

Berkeley, CA

August 2005 - May 2008

Workshops & Invited lectures

Guest Speaker

Quantitative Biosciences Career Seminar
Georgia Institute of Technology, Atlanta GA

November 2, 2021

Guest Lecturer

Quantitative Biosciences Seminar (Instructor: William Ratcliff)
Georgia Institute of Technology, Atlanta GA

October 6, 2021

Guest Lecturer

April 12, 2021

Computation and the Brain (Instructor: Santosh Vempala)
College of Computing,
Georgia Institute of Technology, Atlanta GA

November 11, 2016

Teaching Assistant

Data Science and Data Skills for Neuroscientists
 Organized by Konrad Kording (Northwestern) & Alyson Fletcher
 (UCLA)
Society for Neuroscience, San Diego, CA

Guest Lecturer

Mathematical Modeling Course (Instructor: Braden Brinkman)
Department of Applied Mathematics,
University of Washington, Seattle WA

May 12, 2016

UNDERGRADUTE RESEARCH EXPERIENCE

Research Assistant, Visiting Student
Harvard University
School of Engineering and Applied Sciences
Advisor: Donhee Ham, Ph.D.

July 2008 - June 2009
 Cambridge, MA

ICBP Summer Undergraduate Research Fellow, Student Research Assistant
Lawrence Berkeley National Laboratory
Life Sciences Division
Advisors: Paul Spellman, Ph.D., Joe Gray, Ph.D.
Postdoc mentors: Laura Heiser, Ph.D., Jatinder Arora, Ph.D.
**Awarded a Summer Integrative Cancer Biology Program (ICBP) Fellowship from the National Cancer Institute (NCI/NIH)*

June 2007 - May 2008
 Berkeley, CA

PROFESSIONAL MEMBERSHIPS

Society for Industrial and Applied Mathematics (SIAM), Society for Neuroscience (SfN), Vision Sciences Society (VSS), Organization for Computational Neuroscience (OCNS)

PROFESSIONAL SERVICES

Referee

- Journals: Journal of Neuroscience, Cell Reports, Science Advances, PLOS Computational Biology, Neural Computation, IEEE Design & Test, SIAM Undergraduate Research Online, PLOS One
- Conferences: Computational and Systems Neuroscience (Cosyne; 2018, 2019, 2020), Cognitive Computational Neuroscience (CCN; 2017, 2018, 2019)
- Review Editor of Frontiers in Computational Neuroscience

Graduate Committee Member, School of Mathematics, Georgia Institute of Technology (2021-Present)

Co-organizer of the Boeing Distinguished Speaker Series in Applied Mathematics at the University of Washington (2015- 2019)

Co-organizer of the Computational Neuroscience Seminar Series at the University of Washington (2016 - 2018)

COMMUNITY SERVICES & OUTREACH

Guest discussion panelist for a summer immersion group of high school students organized by Girls Who Code
(July 19, 2017)

Amnesty International Urgent Action Network (2001- 2019)

Volunteer tutor at Martin Luther King Junior High School, Berkeley, CA (August 2005 - May 2006)