HARSHA GURNANI, PhD

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PROFESSIONAL APPOINTMENTS

Postdoctoral fellow, *New York University*. Advisor: Prof Cristina Savin 2025-
Schmidt Science Fellow, *University of Washington*. Advisor: Prof Bing Brunton 2023-2025
Undergraduate research Internship, *Brandeis University*. Advisor: Prof Eve Marder, Dr Tim O'Leary 2015-2016

EDUCATION

PhD in Neuroscience, *University College London* 2016-2022
Advisor: Prof R Angus Silver, FRS
Bachelor of Science with Major in **Biology**, Minor in **Mathematics** 2012-2016
Indian Institute of Science [First Class with Distinction]

AWARDS, HONORS, & DISTINCTIONS

Schmidt Catalyst Grant (joint with Juncal Arbelaiz) 2024-2026
UW/eScience Data Science Fellowship 2023-2025
Schmidt Science Fellowship 2022-2024
Wellcome Trust PhD Studentship 2016-2021
Khorana Scholarship for 3-month research internship [Khorana Scholars Program, DBT] 2015
KVPY 4-year Undergraduate Fellowship [Dept. of Science and Technology, India] 2012-2016
eScience Postdoctoral Grant 2024
Travel grant from Gatsby Foundation for ICTP Summer Workshop 2024
Computational and Systems Neuroscience (Cosyne 2019) Travel grant 2019
Travel grant from DeepMind for Cajal Course in Computational Neuroscience (CCCN 2017) 2017
IISc UG University Gold Medal 2016

RESEARCH INTERESTS

Distributed learning systems; cognitive flexibility; dynamical systems and control; deep reinforcement learning

PUBLICATIONS

Gurnani H*, *Liu W, Brunton BW*. **Feedback control of recurrent dynamics constrains learning timescales of motor adaptation**. *bioRxiv* 2024 (under review); doi: 10.1101/2024.05.24.595772

Sinha A, Gleeson P*, Marin B, Dura-Bernal S, Panagiotou S, Crook S, Cantarelli M, Cannon RC, Davison AP, Gurnani H, Silver RA*. **The NeuroML ecosystem for standardized multi-scale modelling in neuroscience.** eLife 2024; doi: 10.1101/2023.12.07.570537

Gurnani H*, Cayco-Gajic NA*. **Signatures of task learning in neural representations**. Curr Opinion in Neurobiology - Computational Neuroscience issue 2023, doi: 10.1016/j.conb.2023.102759

Gurnani H*, Silver RA*. **Multidimensional population activity in an electrically coupled inhibitory circuit in the cerebellar cortex.** Neuron 2021; doi: 10.1016/j.neuron.2021.03.027

Lanore F, Cayco-Gajic NA**, ***Gurnani H****, Coyle D, Silver RA*. **Cerebellar granule cell axons support high dimensional representations.** Nature Neuroscience, 2021; doi: 10.1038/s41593-021-00873-x

Lak A, Okun M, Moss MM,* ***Gurnani H,*** *Farrell K, Wells MJ, Reddy CB, Kepecs A, Harris KD, Carandini M*. **Dopaminergic and Prefrontal Basis of Learning from Sensory Confidence and Reward Value.** Neuron 2020; doi: 10.1016/j.neuron.2019.11.018

Greene SM, Schachat SR*, Arita-Merino N, Cao XE,* ***Gurnani H****, Heyns M, Cagigas ML, Maikawa CL, Needham EJ, Perets EA, Phillips E, Waddle AW, Wilkinson CE, Zhou KC, Zlotnick HM*. **Accessible interview practices for disabled scientists and engineers**. iScience, 2024; doi: 10.1016/j.isci.2024.110220

In preparation:

Barri A,* ***Gurnani H****, Weichert, MT, Silver RA*. **Cerebellar-like structure improves feedback-learning in recurrent neural networks**.

* denotes (co-) first authors

TEACHING AND MENTORING

Sensation, Perception and Beyond, UW Bothell;	Co-instructor and course developer	2024
STEP-WISE Scholar, University of Washington;	Pedagogical training	2023-2024
BIOL0029: Computational Biology, UCL;	Teaching Assistant (TA)	2021
Data Science and Machine Learning in Python, UCL;	Course instructor and content developer	2020, 2021
NEUR0019: Neuroinformatics course (methods in quantitative neurophysiology), UCL;	TA	2020, 2021
Systems Training in Maths, Informatics, Statistics and Computational Biology, UCL;	TA	2018, 2019
Computational Approaches to Memory and Plasticity (CAMP), Bangalore;	TA	2016

Mentees:

Yiwen Xu (undergraduate student, NYU Shanghai)	2025-
Jessica Schmilovich (high school student, NYU GSTEM program)	2025
Jianqiao (Lawrence) Hu (Neuroscience PhD student, UW)	2023-2025
Weixuan Liu (undergraduate researcher, UW Women in Applied Math Mentorship)	2023-2025
Brennan Summy (undergraduate researcher with ENDURE program, UW)	2024
David Orme (MRC PhD student, UCL)	2020-21
Lewis Winyard (undergraduate thesis project, UCL)	2019-20
Grade 5/6 students with ReachOut, UK	2019-2021

SELECTED PRESENTATIONS

Project:	**Dynamics-based alignment across sessions reveals latent neural computation**	
	Harsha Gurnani*, Matt Dowling, Christine Constantinople, Cristina Savin	
[Poster]	Cosyne 2026 (upcoming)	Mar 2026
[Talk]	Center for Neural Science, NYU	Nov 2025
Project:	**Feedback control of recurrent dynamics constrains learning timescales during motor adaptation**	
	Harsha Gurnani*, *W Liu, BW Brunton*	
[**Talk**]	Junior Theoretical Neuroscientist Workshop, Flatiron Institute	Jul 2025
[**Invited talk**]	Cosyne workshop – Dynamics of brain computations through the lens of control theory	Mar 2025
[**Invited Talk**]	Savin and Constantinople labs, NYU	Jan 2025
[**Invited Talk**]	UCL Gatsby Unit	Nov 2024
[**Invited talk**]	Bernstein Conference – Workshop on Bridging RNNs and Data	Sep 2024
[Poster]	Data-Driven Discovery: AI and Modelling in Biology (Allen Institute)	Sep 2024
[**Invited talk**]	Orsborn lab, University of Washington	July 2024
[**Talk**]	ICTP Workshop on Recent Advances in Theoretical Neuroscience	Jun 2024
[**Talk**]	Mathematics Of Neuroscience and AI	May 2024
[**Talk**]	NCEC – Neural Computation and Engineering Connection (UW)	May 2024
[Poster]	Cosyne 2024	Feb 2024
Project:	**Transformation of cortico-pontine inputs during associative learning**	
	Harsha Gurnani*, *RA Silver*	
[Poster]	Lake Conference, Neural Dynamics	Oct 2023
[**Invited talk**]	5th France Cerebellar Meeting	Feb 2022
Project:	**Cerebellar-like structure improves feedback-learning in recurrent neural networks**	
	Alessandro Barri,* ***Harsha Gurnani****, RA Silver*	
[Poster]	ICTP Workshop on Recent Advances in Theoretical Neuroscience	Jun 2024
[Poster]	Cosyne 2021	Feb 2021
Project:	**Dynamics of electrically coupled inhibitory networks**	
	Harsha Gurnani*, *NA Cayco Gajic, RA Silver*	
[Poster]	Computational and System Neuroscience conference (*Cosyne*)	Feb 2021
[**Talk**]	Janelia Junior Scientist Workshop on Theoretical Neuroscience	Oct 2019

Project: **Coordination of inhibitory Golgi population activity in the cerebellar cortex**
Harsha Gurnani*, RA Silver*

[**Talk**]	Gordon research Seminar & Conference (Cerebellum)	July 2019
[Poster]	Computational and Systems Neuroscience conference (*Cosyne 2019*)	Mar 2019
[Poster]	3rd France Cerebellar Meeting	Jan 2019
[Poster]	Champalimaud Research Symposium	Oct 2018

Project: **Imaging circuit function across multiple scales with non-linear acousto-optic microscopy**
*RA Silver, Antoine Valera**, Harsha Gurnani**, T J Younts, VA Griffiths, S Punde, TF Alfonso, P A Kirkby, KMNS Nadella*

[Poster]	NIH Brain Initiative meeting	Jun 2021

Project: **Dopaminergic and frontal signals for reward learning in perceptual decisions**
Armin Lak, M Okun, M Moss, **Harsha Gurnani**, MJ Wells, CB Reddy, KD Harris, M Carandini*

[Poster]	Neuroscience 2018 (SfN)	Nov 2018
[Poster]	Neuroscience 2017 (SfN)	Nov 2017

Project: **Maintaining neuronal properties during growth with local and global homeostatic regulation**
Harsha Gurnani*, T O' Leary, E Marder*

[Poster]	Neuroscience 2016 (SfN)	Nov 2016
[Talk]	Dynamic Neural Networks: STG Meeting 2015	Oct 2015

WORKSHOPS AND SCHOOLS

Junior Theoretical Neuroscience Workshop, Flatiron Institute	July 2025
Data-Driven Discovery: AI and Modeling in Biology	Sep 2024
ICTP Junior Scientist Workshop on Advances in Theoretical Neuroscience	Jun 2024
Janelia Junior Scientist Workshop on Theoretical Neuroscience	Oct 2019
Optical Imaging and Electrophysiological Methods in Neuroscience	May 2018
CAJAL Course in Computational Neuroscience	Aug 2017
Computational Approaches to Memory and Plasticity	Jul 2014
Bangalore Cognition Workshop	Dec 2013

VOLUNTEERING AND SERVICE

Writer/Editor at Stories of Women in Neuroscience (Stories of WiN)	2025-
Cosyne workshop (Learning fast and slow); co-organized with Jacob Sacks, Matt Golub	2025
Organizing committee, UCL NeuroAI	2022
Organizing committee, UCL PhDs in Systems Neuroscience	2019-2020
PhD student committee, NPP, UCL	2018-2019
Winter volunteer with CRISIS UK	2016-2018
Volunteer at Notebook Drive, IISc	2013-2016
Ad hoc reviewer for *Neuron*, *PLOS CB*, *Nature Neuroscience*, *COSYNE*, *UW Bio* departmental awards, Schmidt Polymaths Program	2019-

REFERENCES

Prof Cristina Savin	Associate Professor, Centre for Neural Science and Centre for Data Science, New York University, USA
Prof Bing W Brunton	Professor & H. Stewart Parker Endowed Faculty Fellow, Department of Biology, University of Washington, USA
Prof R Angus Silver	Professor & Wellcome Trust Principal Research Fellow, Department of Neuroscience, Physiology & Pharmacology, University College London, UK
Prof N Alex Cayco Gajic	Group for Neural Theory (GNT), École Normale Supérieure (ENS), Paris, France