

CURRENT AFFILIATION	Assistant Professor Department of Biomedical Engineering & Wu Tsai Institute Yale University, New Haven CT	
EDUCATION	Massachusetts Institute of Technology (MIT) , Cambridge MA <i>Ph.D in Electrical Engineering and Computer Science</i>	Sep 2011 – Aug 2017
	Johns Hopkins University (JHU) , Baltimore MD <i>Master of Science in Biomedical Engineering</i>	Sep 2009 – May 2011
	Swiss Federal Institute of Technology (EPFL) , Lausanne, Switzerland <i>Bachelor of Science in Mechanical Engineering</i>	Sep 2006 – June 2009
RESEARCH & INDUSTRY EXPERIENCE	Saxena Lab for Neural Control, Yale University Assistant Professor, Department of Biomedical Engineering	July 2023 – Present
	Saxena Lab for Neural Control, University of Florida Assistant Professor, Department of Electrical and Computer Engineering	Oct 2020 – June 2023
	Center for Theoretical Neuroscience, Columbia University <i>Swiss National Science Foundation Postdoctoral Research Fellow</i> Research Advisors : Liam Paninski & John Cunningham	Oct 2017 – Oct 2020
	Laboratory of Information and Decision Systems, MIT <i>Graduate Researcher</i> Research Advisor : Munther Dahleh	Sep 2011 – Aug 2017
	Brain Inspired Computing Team, IBM Research <i>Research Intern</i> Mentor : Arnon Amir Manager : Myron Flickner	May 2015 – Aug 2015
	Neuromedical Control Systems Lab, JHU <i>Graduate researcher</i> Research Advisor : Sridevi V. Sarma	Sep 2009 – May 2011
GRANTS & FELLOWSHIPS	Co-PI for Simons Foundation SFARI 2023 Winter Pilot grant , with PI Nancy Padilla-Coreano at UF. [2023 – 2025]	
	PI for National Science Foundation NCS grant , with Co-PI Anne Churchland at UCLA. [2022 – 2026]	
	PI for National Institute of Health, Brain Initiative R01 . [2022 – 2025]	
	Co-PI for UF Research Opportunity Seed Fund , with PI Nancy Padilla-Coreano at UF. [2022 – 2024]	
	PI for Artificial Intelligence Catalyst Fund , awarded to 20 faculty members across the University of Florida. [2021 – 2021]	
	Postdoc.Mobility Fellowship by the Swiss National Science Foundation [2018 – 2020]	

PREPRINTS

Almani, M.N., Lazzari, J., Chacon, A., **Saxena S.**, “ μ Sim: A goal-driven framework for elucidating the neural control of movement through musculoskeletal modeling” *bioRxiv*, 2024.

Yi D., Musall S., Churchland A., Padilla-Coreano N., **Saxena S.**, “Disentangled multi-subject and social behavioral representations through a constrained subspace variational autoencoder (CS-VAE)” *bioRxiv*, to appear in *eLife*, 2023.

Zhang Y., Mitelut C., Arpin D. J., Vaillancourt D., Murphy, T. H., **Saxena S.**, “Behavioral Classification of Sequential Neural Activity Using Time Varying Recurrent Neural Networks,” *bioRxiv*, 2023.

JOURNAL
PUBLICATIONS

Zhang X., Yi D., Behdad S., **Saxena S.**, “Unsupervised Human Activity Recognition Learning for Disassembly Tasks”, *IEEE Transactions on Industrial Informatics*, 2023.

Berryman D., Barrett J., Liu C., Maugee C., Waldbaum J., Yi D., Xing H., Yokoi F., **Saxena S.**, Li Y., Motor deficit and lack of overt dystonia in Dlx conditional Dyt1 knockout mice, *Behavioural Brain Research*, 2023

Golabek, J., Schiefer, M., Wong, J.K., **Saxena, S.**, Patrick, E., “Artificial neural network-based rapid predictor of biological nerve fiber activation for DBS applications”, *Journal of Neural Engineering*, 2023

Mitelut C., Zhang Y., Sekino G., Boyd J., Bolanos F., Swindale N. V., Silasi G., **Saxena S.***, Murphy T. H.* “Mesoscale cortex-wide neural dynamics predict self-initiated actions in mice several seconds prior to movement.” *eLife*, 2022.

Koch C., Svoboda K., Bernard A., Basso M. A., Churchland A. K., Fairhall A. L., Groblewski P. A., Lecoq J. A., Mainen Z. F., Mathis M. W., Olsen S.R., Pouget A., **Saxena, S.**, Siegle J. H., Zador A. M. (2022). “Next-generation brain observatories”. *Neuron*, 2022.

Saxena S.*, Russo A.*, Cunningham J., Churchland M. “The hypothesis of low trajectory tangling predicts motor cortex population activity across movement speeds” *eLife*, 2022.

Warriner C. L., Fageiry S., **Saxena S.**, Costa R. M., Miri A. “Motor cortical influence relies on task-specific activity covariation”. *Cell Reports (Accepted)*, 2022.

Abe T., Kinsella I., **Saxena S.**, Paninski L., Cunningham J. “Neuroscience Cloud Analysis As a Service” *Neuron*, 2022

Couto J., Musall S., Sun X., Khanal A., Gluf S., **Saxena S.**, Kinsella I., Abe T., Cunningham J., Paninski L., Churchland A. “Chronic, cortex-wide imaging of specific cell populations during behavior ” *Nature Protocols vol. 1(25)*, 2021

Saxena S., Kinsella I., Musall S., Kim S., Meszaros J., Thibodeaux D., Kim C., Cunningham J., Hillman E., Churchland A., Paninski L. “Localized semi-nonnegative matrix factorization (LocaNMF) of widefield calcium imaging data” *PLOS Computational Biology vol. 16(4)*, 2020.

Saxena S., Sarma S.V., Dahleh M. “Performance Limitations in Sensorimotor Control: Trade-offs between Neural Computing and Accuracy in Fast Tracking.” *Neural Computation 32(5)*, 2020.

Hernandez D., Moretti A., **Saxena S.**, Wei Z., Cunningham J., Paninski L. “Nonlinear Evolution via Spatially-Dependent Linear Dynamics for Electrophysiology and Calcium Data” *Neurons, Behavior, Data analysis, and Theory (NBDT)*, 2020

Saxena S., Cunningham J.P. “Towards the Neural Population Doctrine” *Current Opinion in Neurobiology*, vol. 55, 2019.

Saxena S., Sarma S.V., Patel S.R., Santaniello S., Eskandar, E., Gale, J.T. “Modulations in Oscillatory Activity of Globus Pallidus internus Neurons During a Directed Hand Movement Task - A Primary Mechanism for Motor Planning.” *Frontiers in Systems Neuroscience*, 2019

Kahn K., **Saxena S.**, Eskandar E.N., Thakor N., Schieber M., Gale J.T., Averbeck B., Eden U. and Sarma S.V. “A Systematic Approach to Selecting Task Relevant Neurons.” *Journal of Neuroscience Methods*, 2015.

Saxena S., Santaniello S., Gale J.T., Montgomery E. and Sarma S.V. “Aggregate Input-Output Models of Neuronal Populations.” *IEEE Transactions on Biomedical Engineering*, vol. 59, 2012.

Eum, W., Smith, C., **Saxena, S.**, “Region-based conversion of neural activity across sessions”, *2023 11th International IEEE/EMBS Conference on Neural Engineering (NER)*, 2023

Yi, D., **Saxena, S.**, “Neural Correlations Across Mice During Spontaneous and Task-Related Behaviors”, *2023 11th International IEEE/EMBS Conference on Neural Engineering (NER)*, 2023

Zhang Y., **Saxena, S.**, Behavioral Classification of Sequential Neural Activity Using Time Varying Recurrent Neural Networks, *Workshop on Robustness in Sequence Modeling, NeurIPS*, 2022.

Almani, M.N., **Saxena, S.**, “Deep Reinforcement Learning mimics Neural Strategies for Limb Movements” *Cosyne*, 2022.

Almani, M.N., **Saxena, S.**, “Recurrent neural networks controlling musculoskeletal models predict motor cortex activity during novel limb movements” *2022 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, 2022.

Yi, D., **Saxena, S.**, “Modeling the behavior of multiple subjects using a Cauchy-Schwarz regularized Partitioned Subspace Variational AutoEncoder (CS-PS-VAE)” *2022 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, 2022.

Zhang, Y.G, Mitelut, C., Silasi, G., Bolanos, F., Swindale, N., Murphy, T., **Saxena, S.** “Uncovering the effect of different brain regions on behavioral classification using recurrent neural networks. In *2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, 2021.

Batty E.*, Whiteway M.*, **Saxena S.**, et al. “BehaveNet: nonlinear embedding and Bayesian neural decoding of behavioral videos” *Advances in Neural Information Processing Systems (NeurIPS)*, 2019.

Saxena S., D’Aleo R., Schieber M., Dahleh M., Sarma S.V. ”Reconstructing Neural Activity

and Kinematics Using a Systems-Level Model of Sensorimotor Control” *Proceedings of the IEEE Engineering in Medicine and Biology Conference*, 2018.

Yepes A.J., Tang J., **Saxena S.**, Brosch T. and Amir A. “Weighted Population Code for Low Power Neuromorphic Image Classification” *International Joint Conference on Neural Networks*, 2016.

Saxena S., Dahleh M. “Analyzing the Effect of an Integrate and Fire Encoder and Decoder in Feedback.” *Proceedings of 53rd IEEE Conference on Decision and Control (CDC)*, 2014.

Saxena S., Dahleh M. “Real-Time Decoding of an Integrate and Fire Encoder.” *Advances in Neural Information Processing Systems (NIPS)*, 2014.

Saxena S., Gale J.T., Eskandar E.N., Sarma S.V. “Modulations in the Oscillatory Activity of the Globus Pallidus internus Neurons during a Behavioral Task - A Point Process Analysis.” *Proceedings of the IEEE Engineering in Medicine and Biology Conference*, 2010.

Saxena S., Santaniello S., Gale J.T., Montgomery E. and Sarma S.V. “Point Process Models show Temporal Dependencies in Basal Ganglia Nuclei under Deep Brain Stimulation.” *Proceedings of the IEEE Engineering in Medicine and Biology Conference*, 2010.

AWARDS	Selected for Rising Stars in Electrical Engineering , UIUC	2019
	Selected for Rising Stars in Biomedical Engineering , Johns Hopkins University	2018
	Honoree of the Graduate Women of Excellence Award , MIT	2017
	Recipient of a Scholarship from the Society for the Neural Control of Movement	2017
	Recipient of a Scholarship from Women in Machine Learning (WiML)	2014

AD HOC REVIEWER	Nature, Nature Methods, Neuron, Nature Communication, NeurIPS, ICLR, PLOS Computational Biology, Royal Society Interface, Cerebral Cortex, Current Biology, Neural Computation, Cosyne, IEEE CDC, IEEE TAC, IEEE EMBS, IEEE SMC
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BROADER IMPACT	Mentored two undergraduate students through the Summer Undergraduate Research at Florida (SURF) program	2021 – 2022
	NeuroMatch Academy Course Developer and Lecturer	2020 – 2022
	Developed and taught course materials for Optimal Control. NeuroMatch Academy is an online summer school for computational neuroscience.	
	BRAINYAC Program, Columbia University	2019
	Co-mentor for two high school students learning computational neuroscience in Summer 2019.	
	Moderator at the Stavros Niarchos Foundation Brain Insight Lecture series	2019
	Founding member of the Diversity and Inclusion Committee , Center for Theoretical Neuroscience, Columbia University	2019 – 2020
	BRAINYAC Program, Columbia University	2019
	Co-mentor for two high school students learning computational neuroscience.	
	MIT K-12 Videos in partnership with Khan Academy	2012
	Created a video called “Fun with Fractals” with Rose Faghih on the ubiquity of fractals in nature, their uniqueness, and how to build these geometric patterns. Currently at 379k views.	