pritish patil

grad student

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publications

journal articles

- **Patil, P.**, Yizhar, O., (2020). "In Vivo Optophysiology Reveals Lateral Inhibition among Layer 1 Interneurons". In: *Neuron* 106.1, pp. 14–16.
- Mahn, M., Gibor, L., **Patil, P.**, Cohen-Kashi Malina, K., Oring, S., Printz, Y., Levy, R., Lampl, I., Yizhar, O., (2018). "High-efficiency optogenetic silencing with soma-targeted anion-conducting channelrhodopsins". In: *Nature Communications* 9.1, p. 4125.

research experience

Role of inhibitory interneurons in working memory

Prof. Ofer Yizhar, Prof. Misha Tsodyks

2017-Ongoing Weizmann Institute of Science

- Made new automated spatial working memory task for mice.
- Studied a theoretical model of working memory with various interneuron subtypes.
- Tested long duration inhibition of c-fos using st-GtACR in the mouse mPFC.

Testing st-GtACR in-vivo with fear conditioning

Prof. Ofer Yizhar

2017 Weizmann Institute of Science

- Injected mice with the st-GtACR in BLA
- Used fear conditioning as an assay to quantify effectiveness of silencing of st-GtACR to prevent extinction of fear conditioning.

Modeling and Recording Starburst Amacrine Cells

Dr. Michal Rivlin

2017 Weizmann Institute of Science

- Learned to patch clamp record from retinal neurons.
- Worked to make detailed biophysically realistic models to simulate Starburst Amacrine cells to study their direction selectivity.

Recovering synchronization of data

Prof. Nachum Ulanovsky

2016 Weizmann Institute of Science

- Analzyed collected data from bat location and electrophysiology to try to recover the lost synchronization between the data streams.

Making a realistic model CA1 Pyramidal Neuron in MOOSE

Prof. Upinder S Bhalla

2015 – 2016 NCBS Bangalore

interests

Working Memory, Behavior, Interneurons, Theoretical Neuroscience, Machine Learning, Data Analysis, Random Matrices, Electrophysiology, Optogenetics

education

Ph.D. student

Weizmann Institute of Science

Apr 2019 – Ongoing

Advisors: Prof. Ofer Yizhar and Prof. Misha Tsodyks

M.Sc. Brain Sciences

Weizmann Institute of Science

Oct 2016 – Apr 2019

Advisors: Prof. Ofer Yizhar and Prof. Misha Tsodyks

B.Sc. Biology with Math minor

Indian Institute of Science

Aug 2012 – Apr 2016

most proud of

Silver Medal at International Biology Olympiad
IBO 2012 Singapore, Singapore

Silver Medal at International Biology Olympiad
IBO 2011 Taipei, Taiwan

Silver Medal at International Astronomy Olympiad
IAO 2010 Sudak, Ukraine

programming

regular

Python julia LaTeX linux

occasional

C shell/bash MATLAB

neuroscience

MOOSE NEURON Brain2

- Wrote an optimization routine with to fit detailed biophysical models of neurons to experimental patch clamp data.
- Worked to extract features to be used in the optimization routine.

Finding network topologies which show adaptation response

Prof. Sandeep Krishna

2014 NCBS, Bangalore

- Wrote fast simulation of protein interactions with Michels-Menten kinetics.
- Sampled various topologies/parameters to find adaptation response.

teaching

Computational Approaches to Memory and Plasticity

Teaching Assistant

2016 NCBS, Bangalore

- Tutorial in Machine Learning for neural data analysis
- Tutorial in Rate models of neural populations and single neurons
- Tutorial in Building a multiscale model from scratch

awards/fellowships

Prize of Excellence

Ekard Research School of Biological Science

2017

In recognition of achievements in undergraduate studies

KVPY (Kishore Vaigyanik Protsahan Yojana) Fellowship

DST, Government of India

2011-2016

Awarded to the top 200 science students from India each year.

NTSE (National Talent Search Exam) Scholarship

NCERT, Government of India

2009-2011

Awarded to the top 1000 students from India each year.

summer schools

Transylvanian Experimental Neuroscience Summer School

2019 Romania

Experimental and theoretical methods to study the brain

Shaping the Future of Bioengineering

2017 Davos

Number of topics trending in the field of bioengineering

Computational Approaches to Memory and Plasticity

2015 NCBS, Bangalore

16-day summer school on the theory and simulation of learning, memory and plasticity in the brain.

Physics of Life, NCBS-Simons Annual Monsoon School

coursework

neuroscience

- Theoretical Models Of Memory: Long-Term, Short-Term, Episodic And More
- Classic Papers In The Neuroscience
- Seminar On Data Analysis For Neuroscience
- Systems Neuroscience Reading Seminar
- Neuroanatomy
- Theoretical Neuroscience
- Methods in Neuroscience
- Topics in Systems Neuroscience
- Theoretical and Computational Neuroscience
- Cellular Neurophysiology
- Fundamentals of Systems and Cognitive Neuroscience
- Fundamentals of Molecular and Cellular Neuroscience
- Introduction To Neuroscience: Systems Neuroscience
- Introduction To Neuroscience: Molecular Neuroscience - Genes To Behavior
- Introduction to Neuroscience: Cellular and synaptic physiology

math

- Stochastic Processes [martingales and brownian motion]
- Probability Theory [measure theoretic]
- Measure theory
- Algebra
- Topology
- Linear Algebra
- Real Analysis

others

- Theoretical and Mathematical Ecology
- Spatial Dynamics in Biology
- Information Theory
- Pattern Recognition and Neural Networks
- Non Equilibrium, Information And Control In Biology

2014 NCBS, Bangalore

Biophysics and soft-matter physics, information processing and decision making, stochastic processes in molecules or populations; dynamical systems models of genetic networks or biomechanical systems