
Personal Info

email: mikail@mit.edu; Date of Birth: 12/20/1995
Address: 76A Pleasant Street, Cambridge, MA 02139
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Education

- 2018-ongoing PhD candidate in Physics (Currently in year 4, expected 2023), Massachusetts Institute of Technology.
- March '19 - present Graduate research in theoretical and computational systems neuroscience
Primary Advisor: Ila Fiete, Secondary Advisor: Mehran Kardar
K. Lisa Yang ICoN Graduate Student Fellow 2022-23
MathWorks Science Fellowship 2021-2022 (one of 20 across the School of Science at MIT)
Seigel Fellowship, Department of Physics 2018-19
- August '21 Methods in Computational Neuroscience (MCN), Summer School at Woods Hole, MA
- 2014-2018 Bachelor's degree from the Indian Institute of Technology (IIT), Bombay in Engineering physics with a minor in **Mathematics** and Major with honours in **Physics**
- High School The Bombay Scottish School, Mahim, Mumbai, India

Conference Abstracts/Posters

- **Khona, Mikail**, Chandra, Sarthak, Konkle, Talia and Fiete, Ila (2022). Modelling the formation of the human visual cortical hierarchy with bottom-up growth. Cosyne Abstracts 2022, Lisbon, Portugal.
- **Khona, Mikail**, Chandra, Sarthak, Acosta, Francisco, Fiete, Ila (2021) The emergence of discrete grid cell modules from smooth gradients in the brain. Cosyne Abstracts 2021.
- **Khona, Mikail**, Xu, Qianli and Fiete, Ila (2020). A model of oscillatory gating of information flow between neural circuits as a function of local recurrence. Cosyne Abstracts 2020, Denver, CO.
- Schaeffer, Rylan, **Khona, Mikail**, Fiete, Ila.
No Free Lunch from Deep Learning in Neuroscience:
A Case Study through Models of the Entorhinal-Hippocampal Circuit, ICML AI4Science Workshop, 2022.

Publications

- **Khona, Mikail**, Fiete, Ila.
Attractor and Integrator Networks in Neuroscience. (in press, Nature Reviews Neuroscience, preprint available at [this arxiv link.](#))
- Schaeffer, Rylan, **Khona, Mikail**, Meshulam, Leenoy, Fiete, Ila.
No Free Lunch from Deep Learning in Neuroscience:
A Case Study through Models of the Entorhinal-Hippocampal Circuit. NeurIPS, 2022. Preprint available at [this biorxiv link.](#)
- Schaeffer, Rylan, **Khona, Mikail**, Fiete, Ila.
Reverse-engineering recurrent neural network solutions to a hierarchical inference task for mice. NeurIPS, 2020.
- **Khona, Mikail***, Chandra, Sarthak*, Fiete, Ila.
Spontaneous emergence of topologically robust grid cell modules: A multiscale instability theory. Submitted, preprint available at [this biorxiv link.](#)
- **Khona, Mikail***, Chandra, Sarthak*, Ma, Joy, Fiete, Ila.
Winning the lottery with neurobiology: faster learning on many cognitive tasks with fixed sparse RNNs. Submitted, preprint available at [this arxiv link.](#)
- G. Madirolas, A. Al-Asmar, L. Gaouar, L. Marie-Louise, A. Garza-Enriquez, **M. Khona**, C. Ratzke, J. Gore, A. Pérez-Escudero.
A taste for numbers: *Caenorhabditis elegans*. foraging follows a low-dimensional rule of thumb. Preprint at [this biorxiv link.](#)
- Schaeffer, Rylan*, Bordelon Blake*, **Khona, Mikail***, Pan, Weiwei, Fiete, Ila.
Efficient Online Inference for Nonparametric Latent Variable Time Series. Conference on Uncertainty in Artificial Intelligence(UAI), 2021.

Technical Skills

- Deep learning with Python: Pytorch
- Scientific computing with Python (NumPy, SciPy) and MATLAB.
- Scientific illustration with Adobe Illustrator.

Past Undergraduate Awards/Achievements

- 2016-2018 Institute Academic Award for the highest GPA among undergraduates in the Physics department (9.95/10)
- 2016-2017 Competitive DAAD-WISE scholarship for an undergraduate project in Germany in 2017 [declined].
- 2014 An All India Rank of 562 (Percentile 99.96) in the **IIT - JEE** examination 2014 out of 1.4 million applicants all over India.
- 2013-2014 INSPIRE Scholarship for Higher Education - A scholarship awarded by the Government of India to meritorious students in high school who plan to pursue a degree in the natural sciences.