Melina Tsitsiklis, PhD

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Highlights

I have worked as a neural data scientist for six years, conducting analyses of structured and unstructured data from multiple modalities, using signal processing and statistics, and communicating my results to wide audiences.

Education

Columbia University 2014 – 2020
Ph.D., Neurobiology and Behavior, to be awarded Oct. 2020
M.A., M.Ph., Neurobiology and Behavior (2016, 2017)

Massachusetts Institute of Technology 2010 – 2014
B.Sc. in Biological Engineering Cumulative GPA: 4.7/5.0
Minor: Brain and Cognitive Sciences

Academic and Professional Experience

Graduate Student Researcher, Columbia University September 2015 – September 2020
Thesis advised by Prof. Josh Jacobs New York, NY

- Collected and analyzed time series data recorded from human neurosurgical patients; led to discovery of new ways in which spatial memories are processes and supported by the brain.
- Developed pipelines to clean, preprocess, and integrate neural and behavioral data.
- Used statistical and machine learning methods to analyze and interpret the neural and behavioral data (eg. hypothesis testing, linear regression, spectral analysis, dimensionality reduction).
- Collaborated with multiple hospital sites to collect data, and communicated research findings to experts and non-experts.

Undergraduate Student Researcher, MIT June 2012– May 2014
Advised by Prof. Susumu Tonegawa, Prof. Ed Boyden Cambridge, MA

- Conducted mouse behavioral training and brain imaging, and characterized subsets of cell populations involved in memory processes using statistical methods (e.g. chi-squared test).
- Analyzed mouse behavior and electrophysiology recording parameters in Matlab to optimize a single-cell recording system used with behaving mice.

Skills

Programming: experienced: Python (NumPy, pandas, scikit-learn), Matlab; proficient: R, Bash scripting

Data analysis: Statistics, Hypothesis testing, Linear regression, Logistic regression, Supervised and unsupervised machine learning methods, Bootstrapping, Time series analysis, Power and phase spectral analysis (Morlet wavelet transform, Hilbert transform), Data visualization (Matplotlib, Affinity Designer)

Languages: English (native), Greek (fluent), Spanish (intermediate)

Publications

M. Tsitsiklis et al. (2020). Single-neuron representations of spatial targets in humans. *Current Biology*.

J. Miller, A. Watrous, **M. Tsitsiklis**, et al. (2018). Lateralized hippocampal oscillations underlie distinct aspects of human spatial memory and navigation. *Nature Communications*.

J.C. McGowan, C. LaGamma, S.C. Lim, **M. Tsitsiklis**, et al. (2017). Prophylactic ketamine attenuates learned fear. *Neuropsychopharmacology*.

Teaching, Volunteering

Electrophysiology of Human Memory and Navigation (BME4000), Columbia Spring 2018
Teaching Assistant

- Collaborated with Prof. Josh Jacobs and other TAs to plan and deliver lectures to a group of 20 undergraduate students.

Columbia University Neuroscience Outreach: CUNO Fall 2015-Spring 2019
Curriculum Development VP, Multi-visit VP

- Coordinated and taught a multi-visit outreach program in which I taught a weekly hands-on neuroscience course at local middle schools.