

SRUTI MALLIK

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sruti-mallik-32719a90



smallik92

SUMMARY

Current Ph.D. candidate in Electrical Engineering with research experience in computational neuroscience, machine learning and control theory. Excited to pursue a career with research and development opportunities in Machine Learning and Data Analytics.

EDUCATION

Washington University in St. Louis

Ph. D. in Electrical and Systems Engineering

M. S. in Electrical and Systems Engineering (GPA – 3.89)

St. Louis, MO, USA

Aug 2016 – May 2021(expected)

Aug 2016 – Dec 2018

Jadavpur University

B. E. in Electrical Engineering (GPA – 8.95)

Kolkata, WB, India

Aug 2011-Jun 2015

SKILLS

- **Programming Languages:** MATLAB, Python, R, C/CPP, SQL
- **Libraries:** Scikit-learn, Pandas, NLTK, Matplotlib, Seaborn
- **Deep Learning Frameworks:** TensorFlow, Keras

RESEARCH EXPERIENCE

Aug 2016- May 2021 (expected)

Normative modeling of neural circuit dynamics to meet control & detection objectives

- Conceptualized from scratch and coded a **computational model** of neural circuitry that mimics olfaction.
- Developed model is highly **predictive** of complex computations that occurs in the brain.

Modeling neural and behavioral adaptation over multiple timescales

- Conceptualized from scratch and coded a **computational model** of that demonstrates neural and behavioral adaptation.
- **Parameter optimization** of the developed model is underway using experimental data.

Using optimal control theory as a framework for analyzing and implementing neural dynamics

- Currently developing optimization frameworks for neural coding problems and analyzing both the **optimal solution** and **solution strategies** from the perspective of neural dynamics.
- This work will be extended for implementation on **mobile robotic systems**.

MENTORSHIP & TEACHING EXPERIENCE

- Mentored one undergraduate and one graduate student in research projects. (Summer 2020)
- Contributed to designing course materials and assignments as a Teaching Assistant to both Undergraduate (*ESE 105 – Fall 2018, 2019, Class Size: 70*) and Graduate (*ESE 553 – Spring 2018, Class Size: 25*) courses.

PROJECTS

Independent Project

- **Classification of images of flowers (*Petals to the Metal* - Kaggle)** *Summer 2020*
Developed a **ResNet architecture** to classify a dataset of 16.5k images of 100 floral classes to ~80% accuracy. Improved performance through **Transfer Learning** (used weighted contributions from pretrained DenseNet and Xception) to improve accuracy to ~93%.

Course Project

- **Epileptic Seizure Recognition** *Spring 2018*
Developed a **Kernel-Based Soft Margin SVM** to classify short duration EEG traces into epileptic and healthy classes with ~91% accuracy.

PUBLICATIONS

Refereed Journal Articles

- **Multiple timescale normative model of sensory and behavioral adaptation**
Sruti Mallik, Hamilton P. White, Dirk Albrecht, ShiNung Ching
In preparation
- **Neural circuit dynamics for sensory detection**
Sruti Mallik, Srinath Nizampatnam, Anirban Nandi, Debajit Saha, Baranidharan Raman, ShiNung Ching
Journal of Neuroscience (April 2020)

Conferences

- **Optimal tracking as a framework for normative synthesis of sensory networks.**
Sruti Mallik, ShiNung Ching
Bernstein conference 2020 (virtual)
- **Multiple timescale normative circuit model of *C. elegans* sensory adaptation & behavior**
Hamilton White(*), Sruti Mallik(*), Baranidharan Raman, ShiNung Ching, Dirk Albrecht
Cosyne 2020 (Denver, CO) (*) Co first authors
- **Normative modeling of sensory network dynamics for stimulus tracking**
Sruti Mallik, Srinath Nizampatnam, Debajit Saha, Baranidharan Raman, ShiNung Ching, Dirk Albrecht
Neuroscience 2019 (Chicago, IL)

RELEVANT COURSES

Introduction to Artificial Intelligence, Introduction to Machine Learning, Bayesian Machine Learning, Optimization, Detection and Estimation, Biological Neural Computation, Probability and Stochastic processes, Deep learning specialization (Coursera)