Kartik Pradeepan

A computational neuroscientist in training that has a passion for data-driven problem solving.

CONTACT

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EDUCATION

Ph.D. (expected Aug 2023)
Computational Neuroscience
Western University, London, ON

BSc. (2013-2018)
Genetics & Physiology
Western University, London, ON

TECHNICAL SKILLS

Programming Languages:
- MATLAB
- Python
- SQL

ML/ AI Tools:
- Scipy/Numpy
- Pandas
- Scikit- Learn
- Pytorch
- TensorFlow
- Keras
- Statsmodel

Natural Language Processing:
- SpaCy (word2vec)
- NLTK (VADER)
- Topic Modelling (LDA/ NMF)
- Text Generation (LSTM)

Visualization:
- Matplotlib
- Seaborn

VOLUNTEER

Society of Graduate Students
Councillor, Society of Neuroscience
Graduate Students Chair and
Volunteer, Robarts Association of
Trainees, Science Rendezvous
Neuroscience Organizer

RESEARCH

Biophysical network modelling of the development of human stem cell-derived autism spectrum disorders (ASD) and Rett Syndrome neurons from patients.

AWARDS

NSERC Postgraduate Scholarship – Doctoral (PGS-D), $63,000 CAD
- Awarded for the project investigating multiscale comparison of stem cell-derived neuronal networks to understand gene-related autism spectrum disorder. Project and expertise ranked in the top 90th percentile of applicants.

Ontario Graduate Scholarship (OGS), $15,000 CAD (Declined)
- Awarded for the project classifying electrophysiological time-series from stem cell-derived neurons. Declined for NSERC scholarship.

Thales Student Innovation Case Competition - Grand Prize, $20,000 CAD
- Problem: Design an AI capable of automatically finding opinion clusters and analyzing pieces of evidence.
- Solution: "Opinion Galaxies: A Machine Learning Network Approach to Big Data in Medical Research." Performed natural language processing on web scraped scientific literature, and visualized relationships between publications in a 3D environment. 1st place out of 17 groups from universities across Canada.

EXPERIENCE

Multiscale comparison of stem cell-derived neuronal networks
- Problem: Expertise across many biological scales to draw meaningful conclusions in systems neuroscience is rare.
- Solution: Developing a multiscale biophysical modelling pipeline and open-source resource that will combine insights across different scopes of neuroscience to describe the mechanism of neurodevelopmental disorders.

Classification of electrophysiological time-series from stem cell-derived neurons
- Problem: Developmental disorders are not easily diagnosable.
- Solution: Identified characteristics of fetal neurons and classified between disease and control groups (Average F1: 93%), and developmental stage (Average F1: 82%) using a DNN.

Analysis pipeline of intracellular and extracellular recordings
- Problem: High-throughput electrical activity from multi-electrode arrays is cumbersome to analyze and traditionally performed manually.
- Solution: Developed an analytical pipeline to batch process recordings to quality control and perform biologically relevant statistical analysis, alleviating manual effort by 85%.

NON-TECHNICAL SKILLS

Scientific communication: Award-winning writer and speaker demonstrated by presentations at numerous national and international conferences, as well as published scientific writing, podcasts, and teaching over 1000+ students.

Teamwork: Currently collaborating with researchers from 3 universities for one project, and 7 universities in another to combine individual neuroscientific expertise to tackle big scientific problems.