**KARTIK** S.PRADEEPAN

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EDUCTION

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| Ph.D. Computational Neuroscience, Western University | GPA: 4.0/4.0 | Expected 04/2024 |
| * Thesis title: *Investigating neuronal network development using multielectrode arrays* | |
| BSc. (Honours) Genetics & Physiology, Western University | GPA: 3.7/4.0 | 2013 – 2018 |

SUMMARY

5+ years of experience in identifying knowledge gaps, designing experiments, performing data mining, developing analysis pipelines, and implementing statistical/machine learning models. My experience in leading cross-functional collaborations and communicating technical findings equips me to work seamlessly in interdisciplinary teams. My background in management consulting for non-profit organizations demonstrates my capacity to apply data-driven solutions to business challenges.

TECHNICAL SKILLS

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| Languages: | Python, MATLAB, SQL, Bash, Git |
| Techniques: | Pandas, Scipy, NumPy, Scikit-Learn, PyTorch, TensorFlow, Keras, Statsmodels, nevergrad,  NLP (SpaCy, NLTK, LLMs via OpenAI API and Hugging Face), Beautiful Soup, Selenium |
| Visualization: | Matplotlib, Seaborn, NetworkX, MNE, Tableau, Illustrator/Affinity Designer |

WORK EXPERIENCE

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| [**Neurocyte Biosystems**](https://uwoca-my.sharepoint.com/personal/kpradeep_uwo_ca/Documents/Career/neurocyte.io) – *Data Scientist & Database Administrator* | 11/2023 – Present |
| * Designed and developed ETL pipelines and feature extraction scripts for high-dimensional neuroscience time-series data. * Providing data products to disease modeling labs investigating neurodevelopmental and neurodegenerative disorders. | |
| **University Consulting Group** – *Management Consultant & Team Lead* | 09/2022 – 04/2023 |
| * Led teams of 5+ consultants across engagements with major NA non-profit organizations, including Athletes for Hope (to expand into Canada) and London Community Foundation (to improve recruitment, retention, and engagement strategy). * Conducted extensive market research, competitor analysis, and regulatory assessment to identify key opportunities and challenges for a market entry strategy tailored to the Canadian non-profit landscape. * Identified pain points of internal processes by conducting internal interviews and collaborating with HR and senior leadership. * Designed a recruitment dashboard to visualize hiring issues and identify high ROI processes – predicted to improve recruiting efforts by 3-fold. * Delivered a detailed implementation plan, outlining a 12-month roadmap of milestones, KPIs, and resources required, to key stakeholders, including the VP and Executive Administrator – predicted to decrease attrition by 50%. | |

PROJECTS

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| **Neuroscientific Anomaly Detection in Multielectrode Data** [[project link](https://github.com/KartikP/Burst-Reverberation-Toolbox); submitted to Biological Psychiatry:GOS] |
| * Designed an anomaly detection algorithm to identify (AUC: 0.82) and classify characteristics in time-series data that are not reported by off-the-shelf multielectrode array analysis software. * Created a data modelling pipeline that applies unsupervised learning and regression techniques and feature generators, resulting in a runtime 90% faster than proprietary analysis software. * Implemented the pipeline into a desktop app using Tkinter for non-coding research scientists to use – currently used by 4 labs. * Techniques applied: K-means clustering, Gaussian Mixed Model, Linear/RANSAC Regression, curve fitting, PCA |
| **Spiking Neural Network Modeling of Rett Syndrome Networks** [published in [Nature Translational Psychiatry](https://www.nature.com/articles/s41398-022-02216-1#Sec30)] |
| * Reduced MSE by 57% by performing model fitting using Bayesian inferencing ([SBI](https://www.mackelab.org/sbi/)) and gradient-free optimization ([nevergrad](https://facebookresearch.github.io/nevergrad/)) in Python to generate experimentally representative single neuron models compared to random search optimization. * Simulated 10 spiking network models based on experimentally relevant parameters to make predictions about disease states and provide mechanistic insight, which eliminated the need for 60% of the wet lab experiments. |
| **Deep Learning for the Diagnosis and Classification of Rett Syndrome** [[project link](https://github.com/KartikP/BIOPHYS9709B-FCNN)] |
| * Classified electrophysiological time series features of stem cell-derived neurons to predict disease and control groups (F1: 93%), as well as developmental stage (F1: 86%) using a deep neural network (technical details in project link). |

RELEVANT AWARDS

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| **Thales Innovation Case Competition** - 1st place out of 52 groups from Canadian Universities [[press release](https://www.kartikpradeepan.com/assets/pdf/ThalesInnovationCaseCompetition2018.pdf)] |
| * Problem: Design an AI capable of automatically finding opinion clusters and analyzing pieces of evidence * Solution: “Opinion Galaxies: A ML Network Approach to Big Data in Medical Research.” * Successful because we: 1) Identified a niche to scope the original problem statement. 2) Designed and iterated prototype in 4 weeks. 3) Communicated appropriate breadth and depth to Thales engineers, designers, and executives. 4) Recognized limitations and proposed alternatives. |

NON-TECHNICAL SKILLS

**Communication**: Seasoned communicator with a track record of presenting at 15+ conferences, publishing scientific writing, [hosting](https://www.podchaser.com/podcasts/incomplete-thoughts-958398) [podcasts](https://gradcastradio.podbean.com/e/episode-240-big-data-from-asd-patient-neurons-generated-in-vitro/), teaching 1000+ students in multiple formats, and organizing workshops to train graduate students in scientific communication.

**Collaboration/Teamwork**: Led collaborations with 8 researchers across 5 institutions to combine individual expertise to tackle complex problems relating to neurodegenerative and neurodevelopmental disorders.