EDUCTION

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

SUMMARY

Computational neuroscientist seeking new data problems. 6+ years of experience in identifying knowledge gaps, designing experiments, developing ETL 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 demonstrates my capacity to apply data-driven solutions to business challenges.

TECHNICAL SKILLS

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

PROFESSIONAL EXPERIENCE

|  |  |
| --- | --- |
| [**Neurocyte Bioinformatics**](https://neurocyte.io/) – *Data Scientist & Data Engineer* | 01/2023 – Present |
| * Led data infrastructure for a cost-effective serverless AWS ETL pipeline using S3, Glue (with PySpark), Athena, and Lambda for ingestion and efficient processing of terabytes of neuroscientific data and storage into data lake houses. * Implementing a web app with visualization tools (using Plotly) to enhance data accessibility and interpretability for collaborative neuroscience research. * Neurocyte is an early-stage start-up providing custom data products to disease modelling 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 North American non-profit organizations to address business needs, including US-to-Canada expansion, as well as employee recruitment and retention strategies. * 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 leadership. * 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

|  |
| --- |
| **Anomaly Detection in Microelectrode Array Data** [[tutorial link](https://www.kartikpradeepan.com/projects/Reverberating_Super_Burst_Detection/); published in [Biological Psychiatry:GOS](https://www.bpsgos.org/)] |
| * Developed an anomaly detection algorithm to identify (AUC: 0.82) and classify features in time-series data that are not reported by popular off-the-shelf microelectrode array analysis software. * Created a data analysis pipeline that applies unsupervised learning, regression techniques and feature generators, resulting in a runtime 90% faster than proprietary analysis software – currently used in 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 and gradient-free optimization in Python to generate experimentally representative 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 feed-forward neural network. |

NON-TECHNICAL SKILLS

**Communication**: Seasoned communicator with a track record of presenting at 15+ conferences, publishing scientific writing, hosting podcasts, 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.

RELEVANT AWARDS

|  |
| --- |
| **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 a prototype in 4 weeks. 3) Communicated appropriate breadth and depth to Thales engineers, designers, and executives. 4) Recognized limitations and proposed alternatives. |

CERTIFICATES

**SQL for Data Science** (University of California, Davis) – Coursera (completed)

**ChatGPT Prompt Engineering for Developers** (DeepLearning.AI) – Coursera (completed)

**Introduction to Machine Learning on AWS** (Amazon Web Services) – Coursera ([completed](https://www.coursera.org/account/accomplishments/verify/YR58J5EF3VV3))

**Attract and Engage Customers with Digital Marketing** (Google) – Coursera (in progress)

**Foundations of Data Science** (Google) – Coursera (in progress)

**AWS Cloud Technical Essentials** (Amazon Web Services) – Coursera (in progress)