KARTIK PRADEEPAN

(+1) 647-999-5698 | kartikspradeepan@gmail.com | in/KartikPradeepan | kartikpradeepan.com

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 – *Data Scientist & Data Engineer* — 09/2023 – 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; published in Biological Psychiatry:GOS]

- 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]

- 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]

- 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]

- 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)
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)