

KARTIK PRADEEPAN

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EDUCATION

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

SUMMARY

Soon-to-be minted computational graduate student seeking new data problems. 5+ years of experience in identifying knowledge gaps, designing experiments, designing and 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
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

PROFESSIONAL EXPERIENCE

Neurocyte Biosystems – <i>Data Scientist & Data Engineer</i>	11/2023 – Present
• Designed and developed an ETL pipeline on AWS involving S3, Glue, Athena, and Lambda to efficiently ingest and process terabytes of high-dimensional electrophysiological (neuroscience time-series) data.	
• Implementing data processing methodologies using AWS Glue and PySpark, as well as visualization tools (Plotly) to enhance data accessibility and interpretability for collaborative neuroscience research.	
• Providing data products to disease modeling labs investigating neurodevelopmental and neurodegenerative disorders.	
University Consulting Group – <i>Management Consultant & Team Lead</i>	09/2022 – 04/2023
• Led teams of 5+ consultants across engagements with major North American non-profit organizations to address business needs, including expansion into Canada, and 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 senior 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 Multielectrode Data [tutorial link; submitted to <u>Biological Psychiatry:GOS</u>]
• Designed and 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 multielectrode array analysis software.
• Created a data analysis 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 <u>Nature Translational Psychiatry</u>]
• 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.

RELEVANT AWARDS

Thales Innovation Case Competition - 1 st 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) 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 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.

CERTIFICATES

SQL for Data Science (University of California, Davis) – Coursera (completed)
ChatGPT Prompt Engineering for Developers (DeepLearning.AI) – 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)