

# KARTIK PRADEEPAN

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## EDUCATION

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 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 for non-profit organizations 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 – Data Scientist & Data Engineer** 11/2023 – Present

- Designed and currently developing an ETL pipeline on AWS involving DirectConnect, 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 – 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

**Anomaly Detection in Multielectrode Data** [[tutorial link](#); 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 modeling 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](#)]

- Reduced MSE by 57% by performing model fitting using Bayesian inferencing ([SBI](#)) and gradient-free optimization ([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](#)]

- 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

**Thales Innovation Case Competition** - 1<sup>st</sup> 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 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

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**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

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**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)