Akalanka Galappaththi, PhD

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Professional Summary

Applied data scientist with a PhD in Software Engineering and 7+ years of experience designing, validating, and deploying machine learning models on large-scale datasets. Experienced across the full analytics lifecycle, including exploratory data analysis, feature engineering, model evaluation, performance monitoring, and documentation. Proven ability to translate complex analytical findings into actionable business insights, support data-driven decision-making, and communicate results clearly to technical and cross-functional stakeholders. Strong foundation in statistical rigor, hypothesis-driven experimentation, and reproducible analysis using Python, SQL, and data visualization tools.

Technical Skills

- **Data analysis & modeling:** Exploratory Data Analysis (EDA), statistical modeling, regression analysis, hypothesis testing, feature engineering, model validation & performance evaluation
- **Programming languages & libraries:** Python (pandas, NumPy, scikit-learn, scipy, statmodels, scikitposthoc), SQL, R
- **Visualization tools & libraries:** Tableau, Power BI, Matplotlib, ggplot2, Excel
- **Data Engineering:** PostgreSQL, MySQL, dbt, ETL pipelines, data cleaning & transformation
- **LLM and NLP:** prompt engineering (zero-shot, few-shot), prompt context optimization (ablation studies), LLM function calling, RAG, vector databases (ChromDB), embedding techniques (TF-IDF, LLM-based)
- **Development practices:** Agile developement, version control (Git/GitHub), CI/CD pipelines, Docker, test-driven development

Professional Experience

Software engineering researcher (Applied ML & Analytics) | Software Maintenance and Reuse lab, University of Alberta (2020 – 2025) | GitHub: github.com/boneyag/DSChecker

- Designed and implemented automated data pipelines using REST APIs to collect, clean, and transform large-scale datasets.
- Conducted exploratory data analysis (EDA) to identify patterns, anomalies, and feature relationships prior to model development.
- Developed and validated predictive models to detect and remediate API misuse, achieving measurable performance improvements (22% increase in detection accuracy and 63% improvement in correction effectiveness).
- Performed feature engineering, statistical testing, regression analysis, and structured model comparison to ensure reliability, robustness, and statistical significance of results.

- Established reproducible evaluation workflows, including performance monitoring, error analysis, and structured documentation of modeling decisions.
- Presented analytical findings through reports and presentations, translating complex statistical outputs into actionable insights for technical and cross-functional stakeholders.

Software engineering researcher (ML & NLP) | Sybil lab, University of Lethbridge (2018 – 2020) | GitHub: github.com/boneyag/TOBE

- Designed and implemented supervised machine learning models for large-scale text datasets, improving classification performance by 23% over prior benchmarks.
- Led data extraction, preprocessing, and model validation processes to ensure the correctness and consistency of the prediction.
- Applied feature engineering techniques to enhance model precision and predictive stability.
- Evaluated model performance using precision, recall, F1-score, and statistical validation methods to support data-driven decision-making.

Technical Lead & Project Coordinator (Teaching Assistant) | University of Alberta (2020 – 2025)

- Led and mentored 20+ project teams through full development lifecycles using Agile methodologies, ensuring timely and structured delivery.
- Collaborated with diverse stakeholders to translate ambiguous requirements into structured technical and analytical solutions.
- Provided guidance on database systems, data modeling practices, version control, and system documentation standards.

Education

PhD in Computing Science (Software Engineering) – *University of Alberta (2025)*
MSc in Computer Science – *University of Lethbridge (2020)*
MPhil in Computer Science – *University of Peradeniya (2018)*
BSc in Computation and Management – *University of Peradeniya (2010)*

Leadership, Recognition & Professional Engagement

- Recipient of competitive graduate scholarships totaling CAD 55K+ (Government of Alberta and University of Alberta), awarded based on academic excellence and research impact.
- Program Committee Member for international computing conferences (2022–2023), contributing to peer review and research quality evaluation.
- Presented analytical research at international conferences, communicating complex technical findings to diverse professional audiences.
- Recognized with a Service Award for student mentoring and leadership within a multi-institution Software Engineering for AI research initiative.