Nitigya Kargeti

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Education

University of Wisconsin-Madison **Expected May 2025**
Master of Science in Data Science (GPA: 3.85/4.0) *Madison, WI*

Manipal University Jaipur **Jul 2019 – Jul 2023**
Bachelor of Technology in Computer Science and Engineering (GPA: 9.35/10) *Jaipur, India*

Projects

Chicago Crime Data Forecasting | *ARIMA, LSTM, DBSCAN, PySpark* **Feb 2025**

- Engineered a hybrid ARIMA-LSTM predictive model that improved crime pattern forecasting accuracy to 85%, enabling law-enforcement to optimize patrol resource allocation and reduce response times.
- Deployed spatial clustering using DBSCAN to identify crime hotspots across 12 crime categories totaling 10M reports, revealing previously undetected correlation patterns between specific areas and crime types, visualizing results through interactive Plotly dashboards that reduced manual analysis time by 30%.

Quantitative Finance Risk Modeling | *Python, Spark, XGBoost* **Jan 2025**

- Devised a multi-factor market volatility prediction framework that achieved 92% correlation with actual market movements by incorporating macroeconomic indicators, technical signals, and sentiment analysis from financial news, outperforming traditional models with a 10% improvement in precision.
- Developed a fully automated trading strategy with an integrated pipeline that ingests real-time data from Alpha Vantage API, rebalances portfolios based on predicted volatility, and implements sophisticated risk management rules that reduced drawdowns by 40% in backtesting.

Hallucination Detection in Vision-Language Models | *Representation Engineering, CCS, Adversarial Testing* **Dec 2024**

- Proposed an approach to identify hallucination sources in Large Vision-Language Models using Contrast-Consistent Search (CCS) across model components, detecting hallucinations with 86.7% accuracy compared to 53.8% baseline.
- Demonstrated through cross-modal transfer experiments and adversarial robustness testing that hallucination prevention relies primarily on language modules, maintaining 75.2% accuracy under visual perturbation and achieving 74.3% accuracy with text-only trained CCS.

Sleep Apnea Detection | *CNN, PyTorch, ECG Signal Processing* **Mar 2023**

- Designed ApneaNet, a specialized CNN architecture, analyzing ECG signals to detect Obstructive Sleep Apnea (OSA), addressing a critical need for accessible screening methods beyond expensive sleep lab studies.
- Published findings in Biomedical Signal Processing and Control (IF: 5.7). The paper receiving 19 citations to date.

Experience

People and Robots Lab, NSF-Funded **Mar 2024 – Jan 2025**
Graduate Student Researcher *Madison, WI*

- Engineered an AI-assisted educational robot system (GPT-4o, specialized knowledge bases, triadic interaction model) resulting in a publication at ACM CHI 2025 ('SET-PAIRED') and demonstrating a 15% improvement in learning retention among 20 child-parent pairs (ages 3-4).
- Performed advanced statistical analysis using Wilcoxon Signed-Rank tests, revealing significant underestimation of children's capabilities in advanced math ($p < .01$) and phonological awareness ($p < .05$), providing accurate developmental insights to the parents.

Centre for Development of Advanced Computing (CDAC) **Sep 2022 – Mar 2023**
Research & Development Intern *New Delhi, India*

- Achieved a 30% reduction in system latency for the P-300 Keyspeller BCI system by re-engineering the signal processing pipeline with optimized implementations of ICA and DB6 Wavelet Template matching.
- Enabled reliable real-time BCI performance by implementing optimized epoching and buffering techniques for data stream processing, contributing to a 10% increase in keyspeller classification accuracy.

Technical Skills

Programming: Python, R, Julia, SQL, JavaScript
Frameworks:PyTorch,TensorFlow, scikit-learn, LangChain, NLTK, Transformers
Data Engineering: PySpark, Kafka, AWS, GCP, Docker, Kubernetes, Database Design, ETL Pipelines
Data Science: Statistical Modeling and Inferential Analysis, Probabilistic Modeling, A/B Testing, Hypothesis Testing