

Arun Bharadwaj Suresh

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PROFESSIONAL SUMMARY

Highly driven Ph.D. candidate in Mathematics with 5+ years of experience applying advanced statistical modeling and machine learning to **data driven problems**. Experienced in **time-series analysis** and **non-linear statistical estimation**. Proven track record of translating complex models into robust, production-grade systems (**MLOps**), delivering **scalable solutions** that directly reduce financial loss and ensure compliance in fast-moving environments.

SKILLS

Machine Learning and AI: Supervised/Unsupervised learning, Forests, (Deep, Conv) Neural networks, XGBoost

Data Science: Regression and Stochastic analysis, Predictive modeling, Causal Inference, Time-Series Analysis.

Programming Languages: Python, R, SQL, Julia, C++.

Tools: PyTorch, Numpy, Scikit-learn, Power-BI, Tableau, Langchain (NLP), GCP/AWS, PySpark (beginner), MLOps tools.

Certificates: Data Analytics, Adv. Data Analytics (Google), Adv. Learning Algorithms (DeepLearning.ai), AWS (in Progress)

WORK EXPERIENCE

Graduate Research Assistant – Distance Geometry Problems for Data Science

May 2025 - Aug 2025

MU Department of Mathematics

Columbia, Missouri, USA

- Designed a **polynomial-time algorithm** to reconstruct high-dimensional point clouds, exhibiting robustness to noise.
- Demonstrated broader impact on **data transmission** and acoustic vision (applications requiring **high-noise tolerance**).

Graduate Student Mentor and Project Leader - Spatiotemporal modeling (Volunteer)

Jan 2025 - Present

MU Institute of Data Science and Informatics

Columbia, Missouri, USA

- Spearheaded a project analyzing **20,000+** **GIS time-series** records tracking Chronic Wasting Disease spread across Kansas.
- Performed **advanced statistical analyses** (hypothesis, A/B testing etc.) for model selection and evaluation.
- Built a predictive dynamic model to obtain **87.4% accuracy** using geospatial and ML tools (geopd, sklearn)
- Applied PCA to infection co-variate data, training a random forest classifier that **improved classification accuracy to 93%**

Mentor - Markov chains and Stochastic processes

Aug 2024 - Dec 2024

Directed Readings Program - MU Department of Mathematics

Columbia, Missouri, USA

- Mentored a student project concerning Markovian processes and stochastic (Ito) differential equations for epidemiology.
- Pursued ideas and established results that are readily adaptable to model **risk, customer and market behaviors**.

SELECTED PROJECTS

Identifying indicators of financial bubbles via Nucleation Theory (Risk & Time-Series Modeling)

- Built a model to **detect market bubbles across 4 financial sectors** by adapting equations from physical nucleation theory.
- Fitted the adapted model using **non-linear LS regression** to the 2007 housing (time-series) data, and **identified scale invariant indicators with 88% accuracy**, proving ubiquitous for sequential prediction, stress testing and risk forecasting

Maximizing user retention by identifying churn precursors (via Gradient boosting).

- Conducted EDA on the Waze app data to **uncover data-driven narratives and insights** pointing to user retention.
- Engineered **impactful features**, with six ranking among the top ten most predictive, directly influencing model selection.
- The champion machine learning **XGBoost-classifier** exhibited a **validation accuracy of 81%** and a **recall of 16.5%**.

Numeripy – Open-Source Python Package for Numerical Computing

- Designed and deployed a **production-grade Python library** implementing 20+ numerical algorithms.
- Prioritized version control (Git), modular architecture and DevOps principles to ensure long-term stability.
- Achieved **6,000+ total downloads** and **60+ monthly active users**, supported through **open-source documentation**.

Automated Job Application Workflow using n8n, webhooks and AI Agents

- Designed an AI-driven workflow using **n8n, webhooks, and LLMs** to scrape and analyze job postings in real time.
- Applied **database and NLP techniques** to evaluate job-résumé fit and rank opportunities by relevance.
- Automated **résumé selection, bullet-point optimization, and cover-letter ideas** via Google API integrations.
- **Reduced manual application effort by 80%** while improving personalization and consistency across submissions.

EDUCATION

PhD in Mathematics

Aug 2021 - Dec 2025

University of Missouri

Columbia, Missouri, USA

Dual B.S. (Honors) + M.S. in Mathematics

Aug 2016 - May 2021

Georgia State University

Atlanta, Georgia, USA

RELEVANT PUBLICATIONS

- Tamir Bendory, Nadav Dym, Dan Edidin, Arun Suresh. 2024. **A transversality theorem for semi-algebraic sets with application to signal recovery...** *Journal of Foundations of Computational Mathematics*.
- Tamir Bendory, Nadav Dym, Dan Edidin, Arun Suresh. 2023. **Phase retrieval with semi-algebraic and ReLU neural network priors.** *SIAM journal on mathematics of data science*.