

SARDER JUNAID AHMED

PhD Applicant in Machine Learning & Artificial Intelligence

Statistical ML — Causal Inference — Trustworthy AI

Dhaka, Bangladesh • +880 171-820-0525 • junaidahmedrupok@gmail.com

[Portfolio](#) • [GitHub](#) • [LinkedIn](#)

IELTS: 7.0 (no band | 6.5) • Nationality: Bangladeshi

RESEARCH INTERESTS

My research develops causally-grounded, fairness-aware machine learning methods for high-stakes classification and policy analytics — spanning graph-based models for environmental governance, robust hypothesis testing for cross-disciplinary data, and uncertainty-aware frameworks for reproducible inference. I am particularly interested in extending this line of work toward principled uncertainty quantification and algorithmic accountability in societal-scale decision systems.

EDUCATION

Bachelor of Science in Computer Science & Engineering

Feb 2025

Rajshahi University of Engineering & Technology (RUET), Bangladesh

CGPA: 3.08/4.00 (Thesis Grade: A+) • Seminar Grade: A+

Relevant Coursework: Statistical Inference, Machine Learning, Deep Learning, Linear Algebra, Probability Theory, Optimization

Research-intensive program with strong emphasis on statistical inference, causal modeling, and ML methodology

Higher Secondary Certificate (HSC)

2018

Pabna Cadet College, Bangladesh • Perfect GPA: 5.00/5.00

Secondary School Certificate (SSC)

2016

Pabna Cadet College, Bangladesh • Perfect GPA: 5.00/5.00

RESEARCH EXPERIENCE

Researcher

2026 – Present

Royal Scientific Publications, Bangladesh

- Conduct mathematical research addressing open problems in computational science and applied ML
- Collaborate on peer-reviewed publications synthesizing statistical theory with practical applications

Senior Researcher & Executive Committee Member

May 2022 – May 2024

Young Learners' Research Lab, Rajshahi University of Engineering & Technology

- Led hypothesis testing (Mann-Whitney U, Kolmogorov-Smirnov, Shapiro-Wilk) with Benjamini-Hochberg FDR correction across cross-disciplinary datasets
- Mentored 5+ junior researchers on Bayesian and causal inference; one mentee published their first conference paper as a direct outcome
- Established reproducible research standards and open science protocols adopted lab-wide
- *Awards:* Esteemed Alumni Award (2024); Certificate of Appreciation for Research Mentorship Excellence (2024)

PUBLICATIONS

Journal Articles:

- **Ahmed, S.J.**, Kwoshik, M.H.R., & Islam Nahian, M.T. (2026). "Machine Learning for Crime Classification: A Fairness-Aware Approach to Class Imbalance." *Journal of Machine Learning and Applications*, 2(1), 9–17. DOI: [10.61577/jmla.2026.100002](https://doi.org/10.61577/jmla.2026.100002)

Book Chapters:

- **Ahmed, S.J.** (2026). "Generative AI and Mathematical Optimization for Football Match Outcome Prediction: A Comparative Study of CatBoost, XGBoost, and TabNet with Kelly Index Stratification." In: Lahby, M. (ed.) *Generative AI and Mathematical Optimization for Performance and Innovation in Football*. Springer Optimization and Its Applications. Springer, Cham. (Invited Chapter, Under Review)

Refereed Conference Papers:

- **Ahmed, S.J.** (2025). “Multi-Dimensional Statistical Similarity for Governance Classification: Beyond Arbitrary Thresholds in Comparative Politics.” *6th Annual Paper Meet Electrical Engineering Division (APMEE 2025)*. Oral Presentation. **Best Research Paper Award.**
- **Ahmed, S.J.**, Islam Nahian, M.T., & Kwoshik, M.H.R. (2026). “CF-EGAT: A Causal Fairness-Aware Equity Graph Attention Network for Country-Level Environmental Livability Classification.” *Symposium on Photonics, Emerging Computational Technologies, Research & AI-Data Science (SPECTRA 2026)*. Oral Presentation. **1st Best Paper Award.** DOI: [10.5281/zenodo.21195761](https://doi.org/10.5281/zenodo.21195761)
- **Ahmed, S.J.**, Islam Nahian, M.T., & Kwoshik, M.H.R. (2026). “RMA-BO: Regret-Minimizing Adaptive Bayesian Optimization.” *Symposium on Photonics, Emerging Computational Technologies, Research & AI-Data Science (SPECTRA 2026)*. Oral Presentation. DOI: [10.5281/zenodo.21194394](https://doi.org/10.5281/zenodo.21194394)

Manuscripts Under Review:

- **Ahmed, S.J.**, Islam Nahian, M.T., Kwoshik, M.H.R., & Nakib, F.N. (2025). *Environmental Livability Assessment via Adaptive Bootstrap-Retrained SHAP and Statistically-Constrained Pareto Counterfactuals: A Cross-National Analysis*. Under review at IEEE SPICSCON 2026.
- **Ahmed, S.J.** (2026). *DeepEnMap: A Multi-Modal Deep Learning Framework with Distance-Penalized Cross-Entropy for Ordinal Energy Poverty Risk Mapping*. Under review at IEMIS 2026 (Springer LNNS Series).
- **Ahmed, S.J.** (2026). *Density-Decoupled, Mask-Ablated Segmentation-Guided Diffusion for Controllable Mammography Synthesis: A Preliminary Study*. Under review at IEMIS 2026 (Springer LNNS Series).
- **Ahmed, S.J.** (2026). *FAI: Feature-Wise Adaptive Imputation via Downstream-Aware Method Selection*. Under review at ICISSET 2026 (IEEE Xplore).

PROJECTS

ReproHub — Automated Research Reproducibility Platform 2024 – 2025
[Live App](#) • [GitHub](#)

- Built a platform that re-runs statistical tests from papers against raw data using a composite scoring model (p-value, effect size, test statistic agreement) as an alternative to p-value-only validation
- Architected a modular engine supporting 11 statistical tests via SciPy/statsmodels, with fuzzy column mapping and automated PDF reports for per-claim verification
- The composite scoring methodology addresses reproducibility beyond existing p-value-centric approaches by evaluating statistical claims holistically

StatsPro — AI-Powered Statistical Analysis Platform 2025 – 2026
[Live App](#) • Deployed on Streamlit Cloud

- Built a full-stack platform automating CSV-to-report workflows with 10 statistical tests (Shapiro-Wilk, ANOVA, chi-square, Mann-Whitney U, OLS, VIF) and Benjamini-Hochberg FDR correction
- Developed ML Studio with 6 models (XGBoost, Random Forest, CatBoost) using 5-fold cross-validation and live inference, with LLM-generated executive summaries
- Designed as a research infrastructure tool to accelerate statistical analysis and ensure reproducibility; deployed internally for 3 research groups

Smart RAG Chatbot — Cited Retrieval-Augmented QA System 2025 – 2026
[Live App](#) • [GitHub](#)

- Built a retrieval-augmented generation system enforcing per-response citation to exact retrieved passages, with decoupled embedding/generation layers to isolate retrieval quality from generation quality
- Implemented MMR-based retrieval re-ranking with configurable chunking parameters for systematic evaluation
- Provides a controlled infrastructure for studying citation-constrained LLM outputs, with implications for reliability and validity in trustworthy AI systems

TECHNICAL SKILLS

- **Mathematics & Statistical Methods:** Linear Algebra, Numerical Analysis, Optimization Theory, Probability Theory, Measure Theory; Hypothesis Testing (Mann-Whitney U, KS, Shapiro-Wilk), FDR Correction, Bootstrap, Bayesian Inference, Causal Inference, Uncertainty Quantification
- **Core ML/AI:** PyTorch, TensorFlow, Scikit-learn, XGBoost, HuggingFace Transformers

- **Deep Learning:** GNNs (Graph Attention Networks), DistilBERT Fine-Tuning, Neural Network Optimization, Transfer Learning
- **LLM Systems:** Retrieval-Augmented Generation (RAG), LangChain, FAISS, Vector Search, Prompt Engineering
- **Data Science & Visualization:** Pandas, NumPy, SciPy, Statsmodels, Matplotlib, Seaborn, Plotly
- **Dev Tools:** Git, Docker, Linux, Jupyter

HONORS AND AWARDS

2026	1st Best Paper Award, SPECTRA 2026
2025	Best Research Paper Award, APMEE 2025
2024	Esteemed Alumni Award, Young Learners' Research Lab, RUET
2024	Certificate of Appreciation for Research Mentorship Excellence, RUET
2018	Perfect GPA (5.00/5.00), Higher Secondary Certificate (HSC)
2016	Perfect GPA (5.00/5.00), Secondary School Certificate (SSC)
2013, 2009	Talentpool Scholarship (National Merit-based)
2013	Principal's Prize for Outstanding Academic Performance
2016–2018	Best Speller Award (×2), Pabna Cadet College

TEACHING & MENTORING

Independent Tutor & Peer Mentor	2019 – Present
Self-employed, Dhaka, Bangladesh	
• Provided free or low-cost tutoring in Physics, Chemistry, Higher Mathematics, and ICT to 50+ students from economically disadvantaged backgrounds • Mentored 10+ university peers in Vector Calculus, Statistics, Linear Algebra, and Machine Learning • Guided 5 students to achieve perfect GPAs (5.00/5.00) on national board examinations • Mentored 4 students to gain admission to premier engineering universities (RUET, BUET, CUET)	

COMMUNICATION & CREATIVE PURSUITS

Radio Jockey & Show Host	2020–2021
Radio Kothabondhu, Dhaka, Bangladesh — <i>Weekly show reaching 10,000 listeners</i>	
Creative Works:	
• Published Poet: Author of poetry collection “Sob Odvutire” (Bengali: <i>All Adventures</i>) — <i>50+ poems, 200+ copies sold</i> • Lyricist, Composer & Singer: 15+ original songs written, composed, and performed • Poetry Recitation: First place in 5+ competitions (2010–2013)	

REFERENCES

Emrana Kabir Hashi	Md. Nahiduzzaman
Assistant Professor	Assistant Professor
Department of Computer Science & Engineering	Department of Electrical & Computer Engineering
Rajshahi University of Engineering & Technology	Rajshahi University of Engineering & Technology
Email: emranakabir@gmail.com	Email: nahiduzzaman@ece.ruet.ac.bd
Phone: +880 1767-616748	Phone: +880 1763-591843

Research Mentor

Research and academic Mentor