

# Banashree Ghosh

---

## CONTACT INFORMATION

banashreeghosh006@gmail.com  
+91-9674691365  
[LinkedIn](#), [Git](#)

Portfolio

## EDUCATIONAL QUALIFICATIONS

**Indian Statistical Institute**, Kolkata, India (July'23)  
Master of Technology (M.Tech) in Computer Science  
Specialization: Data Science  
Thesis: Change-point Analysis of high-dimensional data based on clustering  
Percentage: **75.4%**, First Division with Distinction

**University of Calcutta**, India (July'19)  
Master of Computer Application (MCA)  
Thesis: Hardware Trojan Aware Controller Design for System-On-Chip platform  
Percentage: **74.4%**, First Division

**University of North Bengal**, India (July'14)  
B.Sc(Hons.) Mathematics, Minor: Chemistry, Physics  
Percentage: **61%**, Batch Rank: **1<sup>st</sup>/48** (1st & 2nd year).

## PUBLICATION / CONFERENCE

**Banashree Ghosh**, Raj Abhijit Dandekar, Rajat Dandekar, Sreedath Panat *A Comparative Study of Neural ODE and Universal ODE Approach to Solving SIQRDV Epidemiological Model*, International Conference on Advanced Scientific Computing & Machine Learning. [\[Git\]](#)

- Compared Scientific ML approaches including Neural ODEs and Universal Differential Equations on a comprehensive 6-compartment SIQRDV epidemic model with quarantine and vaccination features, addressing gaps beyond basic SIR models.
- Introduced the “forecasting breakdown point” metric to measure prediction reliability over time. Found Neural ODEs failed at **60%** data while UDEs worked accurately down to **40%** and reached 10% in ideal conditions.
- Showed UDEs are **3-6** times more data efficient than Neural ODEs, making reliable epidemic predictions possible with limited training data, which is crucial for early outbreak situations with incomplete information.
- Validated UDEs’ noise resilience: accurate forecasts at **7%** noise with **40%** data, robust up to **35%** noise, with realistic predictions throughout.
- Built a detailed hyperparameter optimization framework testing various architectures, activation functions, and optimizers across 6 data scenarios ranging from **100%** to **10%** and 3 noise levels of **0%**, **7%**, and **35%**.

## M.TECH THESIS

**Change-point Analysis of high-dimensional data based on clustering** [\[Git\]](#)  
Supervisor: Prof. Anil K. Ghosh, Theoretical Statistics and Mathematics Unit, ISI Kolkata.

- Developed a novel clustering-based change-point detection algorithm for high-dimensional data using modified Agglomerative Hierarchical Clustering methodology with single linkage based on  $\ell_1$ -Mean Absolute Difference of Distances dissimilarity measure.
- Addressed the critical limitation of Euclidean distance failing in high-dimensional settings by proposing MADD dissimilarity measure enabling robust detection of simultaneous changes in both location and scale parameters.
- Established rigorous theoretical convergence guarantees by mathematically proving the Penalized Dunn index converges in probability to true number of change-points as dimensionality increases approaching infinity.
- Validated algorithm performance through comprehensive simulation studies across **13** diverse scenarios and real-world application to MIT Reality Mining dataset containing **48** weeks of high-dimensional network data.
- Demonstrated superior performance outperforming existing methods including E-divisive Kernel MST NNG and MDP approaches achieving accuracy rates of **90-100%** in detecting both location and scale change-points.

WORK EXPERIENCE	<b>Analytics Specialist, Razorpay Payments Private Limited</b> <a href="#">[Link]</a> <i>(July'23 - Present)</i> <ul style="list-style-type: none"> <li>• Led end-to-end analytics for Partnerships, Rize, Checkout, and POS verticals, delivering insights that shaped product and business strategies.</li> <li>• Collaborated with product managers, engineers, designers, and marketing teams on new feature releases, defining key metrics during the concept notes phase and building self-serve dashboards to track adoption in real-time.</li> <li>• Automated daily reporting processes, saving <b>10-15</b> hours weekly while improving accuracy and reducing turnaround time for critical business metrics.</li> <li>• Presented actionable insights in weekly and monthly leadership reviews, directly influencing product roadmaps, go-to-market strategies, and organizational growth initiatives.</li> <li>• Developed ML models, including revamped Partnerships Lead Scoring and Churn Prediction systems, successfully achieving <b>18-20%</b> improvement in partner engagement and <b>8-10%</b> increase in retention rates.</li> </ul>
COMPUTER SKILLS	<i>Programming languages</i> : SQL, Python, R, C <i>Other Software</i> : Julia, MATLAB, Latex
INDUSTRY KEY PROJECTS	<div> <b>Partner Lead Scoring Model</b> <i>(Nov'24 - March'25)</i> <ul style="list-style-type: none"> <li>• Revamped the partner lead-scoring ML model, boosting targeting accuracy and lead conversions, and achieving an impressive <b>18-20%</b> increase in partner engagement.</li> <li>• Enhanced model by adding key features (conversion days, merchant team ownership), removing low-value predictors, and optimizing feature binning to boost accuracy.</li> <li>• Achieved substantial model performance improvement elevating the <i>F1</i> score from <b>0.15</b> to <b>0.81</b> on real-world data, demonstrating remarkable increases in both precision and recall metrics across all evaluation criteria.</li> </ul> </div> <div> <b>Partner Churn Prediction</b> <i>(March'25 - October'25)</i> <ul style="list-style-type: none"> <li>• Designed and deployed a robust end-to-end partner churn prediction model for business growth, strengthening proactive retention strategies and achieving an <b>8-10%</b> improvement in overall partner retention.</li> <li>• Enabled Marketing and Sales teams to identify high-risk, high-value partners <b>30-45</b> days before churn, enabling them to plan targeted retention campaigns accordingly.</li> <li>• Built predictive model with <b>0.72 F1 score</b>, identifying <b>70%</b> of churning partners while optimizing resource allocation.</li> </ul> </div> <div> <b>Latency Analysis for UPI Payment Method</b> <i>(July'25 - September'25)</i> <ul style="list-style-type: none"> <li>• Analyzed transaction latency before and after Ezetap to Single Stack migration to diagnose service degradation impacting merchant experience.</li> <li>• Identified that post-migration, <b>60%</b> of transactions had latency exceeding <b>5</b> seconds compared to only <b>14%</b> pre-migration, revealing critical technical failures causing increased decline rates.</li> <li>• Led bug resolution and system optimization efforts, achieving a <b>10%</b> improvement in payment success rate, which directly increased transaction volume and recovered substantial revenue.</li> <li>• Provided clear data-driven evidence that halted further merchant migrations until technical issues were resolved, protecting platform reliability and merchant trust.</li> </ul> </div> <div> <b>Proactive Success Rate Monitoring System for Payment Platform Reliability</b> <i>(October'25 - Present)</i> <ul style="list-style-type: none"> <li>• Developed multi-model anomaly detection system to identify daily Success Rate drops, starting with rule-based approach and progressing to AI-based ensemble methods combining ARIMA/Prophet for time-series forecasting and Isolation Forest for outlier detection.</li> <li>• Built framework defining Success Rate(SR) drop thresholds (<b>&gt;2%</b>) with severity levels (minor: <b>0.5-2%</b>, moderate: <b>3-5%</b>, critical: <b>&gt;5%</b>) and compared rule-based versus AI-based models for automated alerting.</li> <li>• Demonstrated AI-based ensemble approach outperformed rule-based methods by capturing both gradual trends and sudden anomalies, achieving better detection accuracy and reduced false positive rates across different severity levels.</li> <li>• Developed an automated feature attribution system that identifies contributing factors (payment</li> </ul> </div>

method, bank acquirer, payment gateway, merchant category, bank terminal, etc) when anomalies are detected, reducing root cause identification time by **50%** compared to manual analysis.

**DataGaaru - AI-Powered Analytics Chatbot Platform** *(June '25 - September '25)*

- Architected intelligent AI chatbot using LLM APIs and advanced prompt engineering to interpret natural language queries and deliver real-time business metrics across diverse analytical use cases with **95%** accuracy.
- Built automated data pipeline integrating SQL databases APIs and data warehouses for seamless metric retrieval and complex analytical computations enabling faster insights.
- Deployed a comprehensive self-service analytics platform that significantly reduced data team dependencies and accelerated decision-making through instant query processing capabilities.

SCHOLASTIC  
ACHIEVEMENTS

- Awarded Bravo Award for demonstrating outstanding, impactful performance and exceptional contributions to company objectives. [\[Link\]](#)
- Maintained consistent academic excellence across multiple institutions.
- Graduated with First Division with Distinction in M.Tech from ISI.
- Scored in the top 3.9% (96th percentile) among over 100,000 candidates in the highly competitive GATE Computer Science 2021 examination.
- Admitted to the Indian Institute of Technology (IIT) Bombay for M.Sc in Applied Statistics and Informatics program.
- Ranked AIR 76 in ISI M.Tech Computer Science entrance examination
- Received merit scholarship for securing first division in Semester 1 of undergraduate program

COURSE WORK

**M.Tech in Computer Science:** Probability and Stochastic Processes • Statistical Inference • Linear Algebra • Data Structures & Algorithms • Computer Networks • Computational Biology • Database Management Systems • Theory of Computation • Machine Learning • Computer Graphics  
**MCA:** Digital Logic • Operating Systems • Computer Architecture • Database • Computer Graphics • Cryptography & Network Security • Compiler Design • Artificial Intelligence • ERP & E-Commerce • Financial Accounting & Management • Engineering Mathematics  
**B.Sc. in Mathematics:** Classical Algebra • Real Analysis I • Linear Programming • Real Analysis II • Probability & Statistics • Abstract Algebra  
**Others:** Time-Series Modeling and Forecasting with Applications in R

WORKSHOPS &  
TRAINING

**Advanced Statistical Learning:** Attended 15 days Advanced Statistical Learning programme on high-dimensional statistics and ML, ISI Kolkata (2022).  
**WSDL:** Attended comprehensive Winter School on Deep Learning covering advanced neural architectures and deep learning frameworks organized by ISI Kolkata.  
**Technical Labs:** Completed practical hands-on training in Java Programming C Programming Database Management Systems Digital Logic Design Electronics Lab and Computer Graphics Lab.

CO-CURRICULAR  
ACTIVITIES

- Volunteer with the Milap organization to support underserved communities and create positive social impact.
- Practice mindful living and maintain a balanced lifestyle that promotes physical, mental, and spiritual well-being.
- Enjoy cooking and experimenting with different cuisines as a creative way to relax and explore new flavors.