

Aalekh Roy

New Delhi, India

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Personal Profile

Postgraduate in mathematics and data science with hands-on experience in applied machine learning, time-series modeling, and complex networks. I enjoy working at the intersection of research and engineering, where algorithms meet real-world systems. I'm driven by a deep interest in how data shapes knowledge, decisions, and infrastructure, and I'm looking to grow through interdisciplinary research that bridges technical depth with social relevance.

Education

Institute of Mathematics and Applications, Bhubaneswar

Odisha, India

MSc in Mathematics with Data Science

Aug 2020 - Aug 2022

- Awarded NBHM scholarship for academic excellence (Top 3 rankers).
- Founder and Head Coordinator of the Data Science Society, promoting interdisciplinary collaboration and technical workshops.
- Selected Coursework:** Graduate Algebra, Linear Algebra, Vector Calculus, Functional Analysis, Topology, Stochastic Calculus, Machine Learning, Statistical Learning, NLP, Optimization (Convex and Non-Convex), Deep Learning, Python for Data Science.

Dr. B.R. Ambedkar University Delhi (AUD)

Delhi, India

BA (Honors) in Mathematics

May 2015 - May 2020

- Received semester-wise merit scholarships for academic distinction (Top 5 rankers).
- Interdisciplinary liberal arts education combining mathematical rigor with social sciences and humanities.
- Selected Coursework:** Real Analysis, Calculus, Abstract Algebra, Optimization Theory, Game Theory, Social Theory, Psychology, Statistical Methods in Economics.

Government Sarvodya Vidyalaya, Dharampura

New Delhi, India

High School Certificate (Physics, Chemistry, Mathematics, Computer Science)

Apr 2013

- Graduated with Distinction.

Work Experience

SmartHelio (YC-22)

Noida, India

Data Scientist

Jan 2024 - Present

- Driving the development of predictive analytics algorithms across system faults, performance degradation, and environmental forecasting.
- Leading a 5-member team to revamp the fault detection engine, reducing runtime by 30% and improving accuracy.
- Built an LLM-based internal reporting tool and led development of analytics dashboards for multiple stakeholders.
- Established test-driven development and CI/CD practices to enhance the reliability of ML workflows.
- Co-developed an ANN-LSTM model for weather forecasting under the CRA Project.
- Stack:** Python, PyTorch, Langchain, FastAPI, Ollama, AWS, Azure, MongoDB, Scikitlearn, Stumpy, Nixtla

SmartHelio (YC-22)

Noida, India

Associate Data Scientist

July 2023 - Dec 2023

- Built a predictive maintenance pipeline using XGBoost to forecast soiling rates and optimize cleaning schedules.
- Standardized analytics logic through a centralized internal Python library used across teams.
- Collaborated with Customer Success to align model insights with operational workflows.
- Stack:** Python, XGBoost, Scikit-learn, Stumpy, GitHub Actions, AWS

SmartHelio (YC-22)

Noida, India

Data Analyst

Sept 2022 - July 2023

- Contributed to early-stage analytics infrastructure as the 7th hire during SmartHelio's growth phase.
- Developed pipelines for fault detection and soiling diagnostics in utility-scale PV systems.
- Deployed core analytics modules into SmartHelio's SaaS platform (Autopilot) for real-time diagnostics.
- Stack:** Python, Pandas, SciPy, PVlib, Plotly, Docker, AWS

Academic Internships & Projects

Reading Project: Complex Networks

India

Indian Institute of Information Technology Kottayam

May 2021 - July 2021

- Completed an independent reading project under the mentorship of **Dr. Divya Sindhu Lekha**, focused on complex systems and foundational network models.
- Engaged with key research papers on graph theory and network science, covering structural models and historical evolution.
- Submitted a written synthesis of theoretical insights and conceptual debates.
- Skills:** Network Science, Academic Writing, LaTeX (Overleaf).

Reading Project: Network Analysis in Computational Gastronomy

Delhi, India

Complex Systems Laboratory, IIIT Delhi

Jan 2022 – March 2022

- Worked with **Dr. Ganesh Bagler** to explore network-based approaches in computational gastronomy.
- Analyzed co-occurrence and interaction networks of food ingredients using NetworkX and empirical data.
- Presented critical evaluations of network models and their culinary implications to research peers.
- **Skills:** Python (Pandas, NetworkX), Applied Network Analysis, Research Interpretation.

Summer Research Intern: Scale-Free Networks

India

Indian Institute of Information Technology Kottayam

May 2022 – July 2022

- Conducted critical research under **Dr. Divya Sindhu Lekha** on the statistical foundations and empirical claims of scale-free network structures.
- Engaged with contemporary debates around power-law distributions and their misinterpretations in real-world systems.
- Co-authored a review article titled "*Omnipresence of Scale-Free Networks: A Myth?*", currently under review.
- **Skills:** Research Synthesis, Literature Critique, Scientific Writing, LaTeX.

Skills

Programming Languages	Python (Pandas, NumPy, SciPy, Plotly, PyTorch, Scikit-learn, Pytest), R (dplyr, tidyverse), Julia, SQL
Tools & Platforms	Git, GitHub, Docker, MySQL, AWS (TimestreamDB, S3, EC2), \LaTeX (Overleaf, R Markdown), Notion, Jira.
Technical Domains	Machine Learning, Deep Learning, Statistical Modeling, Time-Series Analysis, Network Analysis, NLP
Soft Skills	Time Management, Teamwork, Leadership, Communication, Analytical Problem-Solving, Research Writing.

Achievements

2021	NBHM Scholarship for Academic Excellence (Top 3 Ranker) , MSc in Mathematics with Data Science	IOMA, Odisha, India
2015-2018	Semester-wise Merit Scholarships for Academic Distinction (Top 5 Ranker) , BA (Honors) in Mathematics	AUD, India
2011	Indira Award for Academic Excellence (Top 1% nationally) , Class 10 Board Examinations	New Delhi, India

Interests

Intellectual Curiosity	Reading across technology, society, philosophy, and mathematics, with a focus on the epistemology of data and the science-society interface.
Interactive Media	Exploring video games as cultural artifacts and evolving storytelling mediums since 2007.
Music and Culture	Passionate about global music traditions, from 70s Japanese punk jazz to Tuareg songwriting from Africa's Sahel region.
Football	Enthusiastic follower and player, inspired by the sport's creativity and social history, including figures like Sócrates .

Languages

English	Professional proficiency
Hindi	Native proficiency

References available upon request.