Prajit Adhikari

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EDUCATION

Thapathali campus, Institute of Engineering, Tribhuvan University. April 2024
Bachelor of Engineering in Industrial Engineering. Thapathali

- Top 5% of the class.
- **Relevant Coursework:** Statistics, Operation Research, Mathematics(Calculus, Linear Algebra, Analysis), Economics, Numerical Methods with MATLAB, Project Management, Supply Chain Management, Finite Element Analysis, Theory of Machine, C Programming and FORTRAN.

RESEARCH EXPERIENCE

Quantitative Researcher at a Private Family Office, Singapore (Remote, 3 months contract) *Feb 2024 - April 2024*

- Conducted research on mean reversion and momentum-based trading strategies, increasing system efficiency and improving strategy ROI.
- Developed and backtested data-driven investment strategies, optimizing portfolio performance and reducing risk exposure.

Operations Research Intern at Lalitpur Metropolitan Office *Jan 2024 - April 2024*

- Optimized waste transshipment routes using Python, GIS, and open-source tools, enhancing cost-effectiveness and sustainability in waste management.
- Designed waste segregation plants and workshops with ERP integration, improving waste processing efficiency and informing policy decisions through statistical analysis.

OptiWaste: Decision Support System for Waste Management (Seminar Presentation) *Jan 2024 - March 2024*

- Developed "OptiWaste" to optimize waste management using clustering algorithms and route optimization with time windows.
- Built model to streamline complex waste management processes taking inspiration from similar regions.
- Contributed research on integrating theoretical models such as Traveling Salesman Problem, Minimal Spanning Trees and Convex Hull theorems with practical applications in waste management.

WORK AND OTHER EXPERIENCE

Lesson and Problems Content Designer/ Reviewer *MathAcademy*| ***Jan 2025-Present***

- Wrote problems and lessons for Discrete Mathematics Course which launched in March 2025 and was quickly promoted to *Reviewer.*
- As a reviewer, I review tasks related to mathematics for machine learning and have been currently writing and designing lessons for SAT and Differential Equation course incorporating pedagogical techniques like scaffolding, spaced-repetitions and adjusted cognitive load.

NLP Researcher & SQL/BI Developer, California *Gavie AI & CloudProAI (Part-time, Remote)*|***July-Nov 2024***

- Built and deployed NLP models on Azure to optimize CRM processes for small-scale businesses, reducing data processing time and improving client engagement through faster response times.
- Streamlined database management with SQL, cutting query execution time, and developed custom BI reports for HR and performance management and led migration of database from Access to modern web-based architecture.

Data and BI engineer, Ireland (Part time) *Emex*|**Nov 2024-*Feb 2025***

- Enhanced data processing capabilities by developing data pipelines for dashboards and analysis of Environmental factors for large transportation companies.
- Improved database performance by redesigning the architecture, leading to reduced redundancy and faster data reload times and developed database views and stored procedures to support data retrieval and manipulation.

Community Operations Manager, Online (Part time). *Optimization4All*|**Sep 2024-Present**

- Conducted and moderated workshops and community connect sessions on VRP, Open Source Solvers and ML+ Optimization problems.
- Collaborated with experts from around the world to publish newsletters, guides, learning materials and project papers.
- Outreach and designs for the sessions such as webinars, workshops and community connects.

TEACHING EXPERIENCE

Mathematical Association of Nepal, Executive Member *June 2019- June 2025*

- Taught algebra, combinatorics and number theory of matheletes from Nepal and prepared handouts on lectures both in person and virtually and graded the papers.
- Developed national math contest problems and provided training in number theory, geometry, algebra, and combinatorics, enhancing participant performance in national competitions.
- Organized nationwide math events, raised $10,000, and boosted online engagement by 40% through content creation and social media management for the association's website, and discord by creating bots and static websites.

Research Training for Mathematical Modeling *Jan 2023, 2024*

- Lectured on differential equations, linear programming and statistical analysis as a tool for mathematical modeling and discussed open world problems interactively with high school students.
- Moderated lecture series from Chinese high school researchers on mathematical modeling.

Online & Offline Tutoring Freelance *2022 - 2024*

- Tutored college students on college algebra, calculus I, II and III, linear algebra, statistics, differential equations, discrete maths and theory of computation.
- Hosted free live classes and paid one-to-one sessions .

EXTRACURRICULAR ACHIEVEMENTS AND ACTIVITIES

Winner of THE PRACTICAL OPTIMIZATION SPRINT *2024*

Advisor at International Mathematics Modeling Competition *2023 & 2024*

- Organized the National Mathematics Modeling Competition and guided teams in developing mathematical models for real-world problems.s
- Mentored participants, offering feedback to improve their analytical and modeling skills, and facilitated workshops to encourage innovative thinking.
- Achieved two Honorable Mention in 2023 and one Honorable Mention in 2024.

Observer at International Mathematics Olympiad, UK *2024*

- Engaged with international teams and experts, enhancing understanding of global mathematical standards.
- Networked with global mathematics leaders, enhancing professional connections and deepening expertise.

Full ride scholarship under Nepal Government for engineering degree *2019*

Academic Excellence Award (All semesters) *2019*

Participation in International Mathematics Olympiad *2018 & 2019*

- Competed in the IMO, representing Nepal in 2018 (Romania) and 2019 (UK).
- Achieved qualification through national rounds, earning gold medals in national competitions.

Excellence in other national olympiads and quiz bowls *2016 - 2018*

- Achieved top honors in various national-level olympiads and quiz competitions, demonstrating a strong aptitude for mathematics and general knowledge.

Hosting live sessions on optimization techniques and building O4A community *2024 - Present*

- Optimization4All is a community of OR professionals, students and industry leaders build to bridge the gap between industry and academia

PUBLICATION

- Chenyue Fan, Ayesha Abdul Qadir Memon, Prajit Adhikari, Muhammad Osama, and Calvin R. Wei. "REVISITING THE SARS-COV-2 MAIN PROTEASE: A 2023 IN SILICO ODYSSEY IN SEARCH OF POTENTIAL INHIBITORS". Journal of Population Therapeutics and Clinical Pharmacology, vol. 30, no. 18, Oct. 2023, pp. 1032-49, doi:10.53555/jptcp.v30i18.3232. **Contribution:** Data pipeline and visualization
- Exploration of Mathematics Olympiad for Nepal (Book) *Work in Progress*
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CONFERENCES

- **AI Conference in Nepal:** Invited as guest by Ministry of Education, Science and Technology.
- **Mathematical and Biological Research Conference:** Participated representing Mathematical Association of Nepal.

PROJECTS

EMSR-b and DAVN Heuristics in Airline Revenue Management [Paper Link] [App Link]

Collaborative research project under Dr. Abhijit Gosavi and Dr. Andreas Emil Feldmann

- Applied and compared revenue management heuristics (EMSR-b and DAVN) for airline booking optimization.

Eddy Current Separator Prototype *July 2023-Sep 2023*

- Designed and deployed a functional prototype for effective waste segregation: fabrication of conveyor belts, welding, brazing, milling and assembly.
- Utilized Fusion 360 and SolidWorks for design and simulation.
- **Technical Skills:** Mechanical and electrical engineering principles.

3D Drone Navigation Simulation *June 2022- July 2022*

- Developed a 3D drone navigation system with static obstacles, integrating A* and RRT algorithms for initial pathfinding and enhanced navigation using reinforcement learning (Proximal Policy Optimization) for dynamic path optimization.
- Evaluated performance based on path length, time, and obstacle avoidance.

TECHNICAL SKILLS

Languages: Python, MATLAB, R, SQL, Julia, C.

Tools & Frameworks: Google OR tools, AMPL, Unix, Flask, MySQL, Pytorch, NumPy, Pandas, Oracle Crystal Ball, Microsoft Suite, MySQL, RStudio, QGIS, PVsyst.

Developer Tools: Excel, VS Code, Git, Tableau, PowerBI, Azure Data Studio, Postman, Notion.

REFERENCES

Er. Sudan Neupane - Assistant Professor, IOE neupanesudan@ioe.edu.np

Binod Prasad Pant - Assistant Professor and HoD at KUSOE; President, MAN binod.pant@ku.edu.np

Dr. Alex F. Smith; Executive Curriculum Designer alex@mathacademy.com