Sagar Bhandari

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Summary

Highly motivated MASc Civil Engineering graduate specializing in transportation data analysis and machine learning. Seeking to leverage advanced analytical skills in a challenging role focused on transportation modeling, system optimization, and demand forecasting. Proven expertise in Python, R, and predictive modeling, complemented by hands-on research experience at the DalTRAC Lab developing sophisticated machine learning models to analyze large-scale travel survey and geospatial data.

Skills

Data Science & Transportation Modeling

- Languages & Libraries: Python (Pandas, Scikit-learn, Pytorch), R, SQL
- Machine Learning: Predictive Modeling, Supervised/Unsupervised Learning, Statistical Analysis
- Data Handling: Data Cleaning, Wrangling, and Quality Assurance for large-scale survey datasets

Technical Proficiencies

- Geospatial Software: QGIS, ArcGIS (Pro, Online)
- Engineering Design: AutoCAD, SketchUp, Civil 3D
- Productivity Suite: MS Office (Word, Excel, PowerPoint, Project)

Professional Competencies

- Analytical: Quantitative Research, Complex Problem-Solving, Workflow Optimization
- Collaborative: Teamwork, Project Coordination, Stakeholder Communication
- Personal: Adaptability, Continuous Learning, Detail-Oriented

Education

MASc Civil Engineering, Dalhousie University — Halifax, NS
Fully Funded Student, Research Assistant at DalTRAC Lab — Jan 2024 – Dec 2025

Bachelor's in Civil Engineering, Pulchowk Campus — Lalitpur, Nepal
Full Scholarship Student — Nov 2017 – Apr 2022

Experience

Research Assistant, DalTRAC Lab, Dalhousie University — Halifax, NS
Jan 2024 – Dec 2025

- Performing comprehensive data preparation and quality assurance for transportation datasets with 15,000+ trips to ensure the integrity and reliability of model inputs.
- Managed the end-to-end data lifecycle for the Lethbridge sample of the Canada Travel Activity (CanTRAC) Survey, including data cleaning, statistical analysis, and visualization, culminating in a comprehensive final report.
- Applying advanced machine learning models, including Explainable Boosting Machines (EBM) and LSTM networks, to analyze complex travel patterns and predict consumer behavior.
- Contributing to scholarly publications on transportation modeling, demonstrating a high level of analytical rigor and technical writing ability.

Civil Engineer, Magic Cube Engineering — Nepal
May 2022 – Dec 2023

- Engaged in the design phase, meticulously creating detailed plans for 20+ construction projects.
- Produced precise and comprehensive cost estimates for projects, ensuring a thorough understanding of incoming and outgoing costs, and maintaining financial viability.
- Managed the finances of construction projects, overseeing budgets, monitoring expenditures, and optimizing resource allocation by 20%.
- Led the planning and supervision of construction projects, developing strategic timelines, and ensuring that projects were completed within the designated time frame and expected resources.
- Fostered a cohesive team environment and achieved project goals by collaborating closely with a 50+ member team, including contractors, laborers, and fellow engineers.

Cofounder, EngineeringDote Lalitpur, Nepal
Oct 2018 – Oct 2022

- Provided frontline support and technical guidance to a community of over 15,000 students annually, demonstrating an ability to support users and troubleshoot issues in a dynamic environment.
- Managed the full development lifecycle of a mobile and a web application, building a strong understanding of the technical and user-facing aspects of a system implementation.
- Led recruitment, onboarding, and training for new interns, showcasing skills in preparing and supporting team members for new roles and projects.
- Analyzed user engagement data to inform content strategy and platform improvements, resulting in increased user satisfaction by 20% and retention by 27%

Projects

Intelligent Survey Analysis System (Agentic AI)

- Architected a multi-modal query system combining LLMs and RAG to provide natural language answers to complex transportation survey data.
- Engineered a pipeline for automated SQL query generation and dynamic creation of analytical charts and geospatial maps.
- Implemented a validation loop for LLM-generated code to ensure 95%+ accuracy in data retrieval.

Halifax Traffic Risk: An ArcGIS StoryMap Analysis
View StoryMap |

- Analyzed 8 years of collision data using Space-Time Emerging Hotspot Analysis to identify long-term risk trends in Halifax.
- Developed an ArcPy script to automate the analytical workflow and published findings via an interactive StoryMap.

Samrachana - Structural Analysis Software
GitHub Repository

- Developed a Python-based software for complex structural analysis, winning 1st prize at LOCUS (Nepal's largest tech showcase).

Undergraduate Capstone & Technical Projects (Pulchowk Campus)

- **Highway Alignment Optimization (Capstone):** Conducted a study of the Kathmandu-Pokhara highway, processing 200km-long raster files and evaluating geometric design/terrain constraints in Civil 3D.
- **Traffic Signal & Urban Analytics:** Engineered optimized signal timing for Koteshwor intersections using field data and simulation; conducted pedestrian flow and parking demand surveys for Kathmandu's urban centers.
- **GIS & Remote Sensing Applications:** Performed 20-year multi-temporal land use analysis using MODIS data and executed PCA/Classification on Sentinel imagery for the Pokhara Valley.

- **Safety Analysis:** Conducted a statistical study on Tipper-related accidents in Nepal to propose policy interventions.

Publications & Conferences

- **Bhandari, S.**, & Habib, M. A. (2025). Developing Skeletal Activity Scheduler using Machine Learning. *Procedia Computer Science, 257,* 412-419.
- **Bhandari, S.**, & Habib, M. A. (2025, April). *Developing a skeletal activity scheduler using machine learning.* Presented at the 16th International Conference on Ambient Systems, Networks and Technologies (ANT), Patras, Greece.
- **Bhandari, S.**, & Habib, M. A. (2025, January). *Predicting consumers' intention to purchase electric vehicles: An explainable machine learning approach.* Presented at the 104th Annual Meeting of the Transportation Research Board, Washington, D.C.
- **Bhandari, S.**, Bhuiyan, M.R.H, & Habib, M. A. (2026, January). *Exploring Deep Learning and Behavioural Segmentation for Predicting Activity Schedules.* Accepted for Presentation at the 105th Annual Meeting of the Transportation Research Board, Washington, D.C.

Certifications & Activities

- **Machine Learning Specialization:** DeepLearning.AI (Courses: Supervised Learning, Advanced Learning Algorithms, Unsupervised Learning, Recommenders, Reinforcement Learning)
- **Spatial Data Science: The New Frontier in Analytics (MOOC):** ArcGIS
- **Cartography (MOOC):** ArcGIS
- **Teaching Assistant:** Introduction to planning
- **GRE Score:** 322 (Quantitative: 166, Verbal: 156)