Sudhan Bhattarai

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Education

Clemson University	*Clemson, SC*
Ph.D. in Industrial Engineering	**Aug. 2021 − Aug. 2025**
Advisor: Associate Professor Dr. Yongjia Song	
Colorado State University-Pueblo	*Pueblo, CO*
M.S. in Industrial and Systems Engineering	**Aug. 2019 − May 2021**
Advisor: Associate Professor Dr. Leonardo Bedoya-Valencia	
Tribhuvan University, Institute of Engineering	*Kathmandu, Nepal*
B.E. in Industrial Engineering	**Aug. 2012 − May 2016**

Experience

Clemson University   *Clemson, SC*

Graduate Research Assistant & PhD Candidate   **Jan. 2022 − Present**

– Developed adaptive optimal decision policies for transportation and inventory management under demand uncertainty, focusing on humanitarian aid and commodity flow networks.
– Improved policy efficiency by incorporating historical data and employing distributionally robust optimization techniques to address future demand scenarios.
– Enhanced decision-making processes by utilizing time series models to manage dynamically updating forecasts.
– Designed and implemented case studies reflecting real-world logistics constraints, operational challenges, and decision-making environments.
– Developed solution techniques for large-scale optimization problems by decomposing them into smaller, manageable subproblems using Benders Decomposition and Stochastic Dual Dynamic Programming (SDDP) algorithms.
– Evaluated trade-offs between cost efficiency and key operational parameters, providing actionable insights for strategic logistics planning and resource allocation.
– Implemented large-scale optimization models in `Python`, utilizing the `Gurobi` solver for efficient and scalable solutions.
– Conducted extensive data analysis, including preprocessing, exploratory analysis, statistical analysis, and hypothesis testing, using `pandas`, `numpy`, `scipy`, and `matplotlib`.

Graduate Teaching Assistant   **Aug. 2021 − Dec. 2021**

– Taught and mentored students in Industrial Applications of Probability and Statistics.

Colorado State University-Pueblo   *Pueblo, CO*

Graduate Assistant & MS Candidate   **Aug. 2019 − May 2021**

– Developed a Mixed-Integer Programming (MIP) optimization model for nurse routing and scheduling in a home healthcare agency, enhancing operational efficiency.
– Implemented and solved the MIP model using `Python` and `Gurobi`, validating its effectiveness through a case study with realistic operational constraints.
– Generated managerial insights through a Pareto frontier analysis, illustrating trade-offs between organizational objectives, employee satisfaction, and client needs.
– Designed predictive models using `TensorFlow` and `scikit-learn`, leveraging DNN, CNN, and RNN architectures for healthcare datasets.
– Executed comprehensive data preprocessing, hyperparameter tuning, and model evaluation techniques to improve predictive accuracy.
– Taught and mentored undergraduate students in engineering design and mechanics.

Teaching Instructor   **Aug. 2020 − Dec. 2020**

– Designed and delivered lectures for the Introduction to Engineering course to undergraduate students.

Additional Experience

Morang Auto Works (MAW) Earthmovers Pvt. Ltd.   *Lalitpur, Nepal*
Technical Sales Representative   **Nov. 2017 – Jan. 2019**

- Developed and maintained client relationships, utilizing data-driven insights to enhance sales strategies.
- Organized and participated in industry expos, promoting business growth and market expansion.

Technical Skills

- **Programming:** Python (pandas, numpy, matplotlib, scipy, TensorFlow, Scikit-Learn), R, Gurobi.
- **Optimization & Modeling:** Linear, Mixed-Integer, Stochastic, and Dynamic Programming.
- **Data Analysis:** Time Series Analysis, Forecasting, Statistical Analysis, Neural Networks, Exploratory Analysis.
- **Simulation:** Arena Simulation.
- **Version Control & Collaboration:** Git, GitHub.
- **High-Performance Computing:** Experience with Clemson University's Palmetto Cluster for parallel and large-scale computing.

Honors

INFORMS Student Chapter, Clemson University   *Clemson, SC*
President   **Aug. 2022 – May 2023**

- Led events, including orientation sessions, conference preparation seminars, and K-12 outreach programs.
- Awarded *Magna Cum Laude* at INFORMS Annual Meeting, 2023.

Presentations

INFORMS Annual Meeting   *Seattle, WA*
Invited Session Presenter   **Oct. 2024**

- **Title:** Multi-stage Stochastic Programming for Integrated Network Optimization in Hurricane Relief Logistics and Evacuation Planning.

INFORMS Annual Meeting   *Phoenix, AZ*
Community Committee Choice Session Presenter   **Oct. 2023**

- **Title:** Multi-Stage Stochastic Programming for Integrated Hurricane Evacuation and Logistics Planning.

IISE Annual Conference   *New Orleans, LA*
Contributed Session Presenter   **May 2023**

- **Title:** Integrated Hurricane Relief Logistics and Evacuation Planning under Forecast Uncertainty: A Case Study for Hurricane Florence.

INFORMS Annual Meeting   *Indianapolis, IN*
Community Session Presenter   **Oct. 2022**

- **Title:** Stochastic Optimization Methods for Integrated Hurricane Relief Logistics and Evacuation Planning.

Publications

- **Bhattarai, Sudhan**, and Yongjia Song. "Multistage stochastic programming for integrated network optimization in hurricane relief logistics and evacuation planning." Networks 85.1 (2025): 3-37. https://doi.org/10.1002/net.22249

- **Bhattarai, Sudhan**, and Yongjia Song. "Integrated Hurricane Relief Logistics and Evacuation Planning under Forecast Uncertainty: A Case Study for Hurricane Florence." Proceedings of the IISE Annual Conference & Expo 2023. https://par.nsf.gov/biblio/10428837

- **Bhattarai, Sudhan**, Yaneth Correa-Martinez, and Leonardo Bedoya-Valencia. "A multi-objective home healthcare routing problem." International Journal of Healthcare Management 16.2 (2023): 311-325. https://doi.org/10.1080/20479700.2022.2102111