Megh Bahadur KC
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EDUCATION

- **Ph.D.** in Civil **Engineering;** University at Buffalo, SUNY- **GPA: 4.00** (ongoing), expected May 2026
  Dissertation Title: "Accelerating Bus Transit Electrification through Optimization, metaheuristics and Reinforcement Learning Algorithms"
- **M. Sc.** in Construction Management, 2020; Pokhara University, Nepal- **GPA: 3.95**
- **B. E.** in Civil Engineering, 2013; Institute of Engineering, Tribhuvan University, Nepal; ranked top 4

WORK EXPERIENCE

SN.	From (mm-yy)	To	Employer	Position	Supervisor
1	01- 2025	to date	University at Buffalo, SUNY	Graduate Research Assistant	Asso. Prof. Dr. Ziqi Song
2	05-2024	01-2025	National Renewable Energy Laboratory (NREL), Denver, CO	Graduate Intern (PhD)	Jason Lustbador, Group Manager
3	08- 2021	01-2025	Utah State University, USA	Graduate Research Assistant	Asso. Prof. Dr. Ziqi Song
4	03- 2020	08- 2021	Pokhara University, Nepal	Asst. Professor	Dr. KN Pandey, Principal
5	07- 2015	08- 2021	Ministry of Physical Infrastructure and Transport, Nepal	Highway Engineer	Director General, Department of Roads
6	05-2015	07-2015	Kathmandu Metropolitan City	Civil Engineer	Rudra Singh Tamang, CEO
7	08- 2014	05- 2015	National Society of Earthquake Technology-Nepal	Team Leader	Suman Shrestha, Project Manager
8	03- 2014	08- 2014	Tribhuvan University, Nepal	Assistant Lecturer	Prof. Dr. Rajan Suwal

Graduate Research Assistant @ University at Buffalo

- Ongoing research on AI in Transportation: *Deep Reinforcement Learning Framework for Simultaneous Fleet Optimization and Charging Scheduling for Multi-line Bus Transit System*
- Built an interactive **Streamlit web app** for US multimodal freight analysis
- Developed and published **freight-analytics-dashboard Python package on PyPI**
- Showcased rapid response to model and write a journal article on "*Household Residential Location Choice Modeling for People with Disabilities*" and accepted to present at ICTD conference 2025

Grant & Proposal Writing Contribution

- NYSERDA RFP 5965- *Electric School Bus Transition Support Contractor*, $ 1 M, 2025-2028 (PI: Dr. Ziqi Song)
  - Drafted **Statement of Work (SoW)** section
- DOE, Joint Office of Energy and Transportation (JOET), Concept paper in response to FOA – *Expanding E-Mobility Solutions through Electrified School Buses*, $250k-1M (PI: Dr. Ziqi Song)
  - Drafted **Background and Proposed Methodology** section

Graduate Intern @ National Renewal Energy Laboratory (NREL)

- Robust optimization of intermodal freight operations (national scale) through simulation of containerized shipment, traffic and disruptive events

- Contributed on SMART 2.0 Freight project by successfully developing & integrating electric variant of NREL- open-sourced FReight Integrated Simulation Model (FRISM) for heterogeneous mixed fleet combination using VNS metaheuristics
- Developed & coded Freight Analysis Framework Flow Containerization Modeling & calibration model at National Scale
- Formulated methodological framework for county level freight flow disaggregation model and developed an algorithm
- Created & hosted interactive Container Freight data visualization Dashboard
- Power BI Visualization, Reports and Automation
- Received Excellent (best) performance grade during review for the year from Group Manager

Graduate Research Assistant @ Utah State University

- Developed and linearized a Mult objective optimization model in GAMS and produced a hybrid metaheuristic algorithm in python 3.10 with solver efficiency (730 seconds) in large-scale networks
- Produced and enhanced a multistage Mult objective linear /nonlinear optimization model with achievement of efficient recharging and scheduling of EVs in 10,000 node networks in 2 stages
- Automated a space time prism (STP) modeling by developing ArcGIS Pro based algorithm in python using arcpy environment to measure accessibility for people with disabilities only in 1.5 months
- Written journal article on "Integrated Optimized Charging Decision and Optimal Battery Sizing of V2G Enabled Electric School Bus System Including Demand Charges & Battery Ageing"
- Prepared literature review article titled "School Transport Electrification - Adoption, Methods, Policy and Strategies: A Comprehensive Review"
- Completed interdisciplinary graduate courses from Data Science, Mathematics and Statistics, College of Business and Landscape architecture apart from College of Engineering
- Led for the best group project in machine learning titled on "Fake News Detection: Investigating ChatGPT" by using Naive Bayes, Random Forest and Neural Networks among 19 groups
- Conducted research on Discrete Mode Choice Modeling using Nested and Multinomial Logit in Pandas Biogeme 3.2.11, resulting policy recommendation for Inclusive Transportation System in Utah
- Completed Term project on Change Detection Analysis for Selected Municipalities in Utah using ArcGIS Pro 3.1
- Term project on Transportation Sustainability titled "Estimation of Mode Choice and potential emission reduction for the newly introduced commuter metro line in Thailand"
- Participated in Kaggle Competition as a part of Final Project on Machine Learning and Data Analytics
- Authored **Six** Journal articles on the independent PhD research & the project I involved which were presented at Transportation Research Board 2024

Other professional and Field Experiences

- Completed feasibility studies for multiple multi-million Highways Projects, providing through cost-benefit analysis
- Obtained design approval for a 17 miles 6-lane road project, representing the GOVERNMENT OF NEPAL in the western region.
- Managed the procurement process for a massive Nrs. 5 billion road project, including bid document preparation, contract work specification, bid publication, evaluation, and contract award.
- Served as a site project manager, leading a team of three engineers, eight sub-engineers, and fifteen site supervisors.
- Skillfully coordinated with the communication manager for the upper government body during the project's execution.
- Recognized with the Best Employee Award in 2019 for reducing office annual costs by 19% through optimizing employee schedules and operations.

- Part-time Assistant Professor, delivering lectures to first-year MSc students on "Project Planning and Control."

RESEARCH EXPERIENCE

Peer Reviewed Journal Articles

- **KC, M. B.,** & Mishra K. (2019). Bidding Trends of Contracts based on Types and Sizes of Projectsunder Road Divisions Butwaland Shivapur. Journal of Advanced Research in Construction and Urban Architecture 2019; 4(4): 7-16. DOI: https://doi.org/10.24321/2456.9925.201905
- **KC, M.B.,** Mishra, A.K. & Karki, R. (2020). Perception Based Assessment of Bidding Practices and Effectiveness of E-Bidding Systemin Nepal. East African Scholars of Economics, Business and Management 2020; 3(7): 588-597. DOI: 10.36349/easjebm.2020.v03i07.002
- Mishra, A.K., **KC, M. B.** & Aithal, P.S. (2020). Association of Number of Bidders and Minimum Bid Ratio (AEr) with Effect of E-bidding of Different Project. International Journal of Management, Technology, and Social Sciences 2020; 5(2): 201-215. DOI: http://doi.org/zenodo.4111956

Under Review and Under-Preparation Journal Papers

- **KC, M. B.,** & Song, Z. (2025). School Transport Electrification - Adoption, Methods, Policy and Strategies: A Comprehensive Review. [Under review].
- **KC, M. B.,** & Song, Z. (2025). Evolving School Transportation: A Comprehensive Approach to Bus Electrification with Dynamic Route Optimization and Partial Charging for Mixed Fleets. [Under review].
- **KC, M. B.,** & Song, Z. (2025). Large Scale School Transport Electrification: Integrated Dynamic Route Optimization, Timetabling, and On-Route Charge Scheduling using Hybrid Metaheuristic Algorithms. [to be submitted to OMEGA, The International Journal of Management Science]
- **KC, M. B.,** & Song, Z. (2025). Multi-Stage, Multi-School Electric Bus Routing and Scheduling Optimization with recharging schedule and re-use of Buses using metaheuristics. [to be submitted to Transportation Science, the journal of the Transportation Science and Logistics Society of INFORMS]
- **KC, M. B.** (2025). Land Use Transition and City Desirability: Case Study of Cache County over Two Decades. [Under review]. *ASCE Urban Planning & Development.*
- **KC, M. B.,** & Song, Z. (2025). Integrated Optimized Charging Decision and Optimal Battery Sizing of V2G Enabled Electric School Bus System Including Demand Charges & Battery Ageing [to be submitted to Applied Energy journal]
- **KC, M.B.,** Song, Z., Park, K. & Christinsen, K. (2025). Understanding Mode Choice Behavior of People with Disabilities: A Case Study in Utah. [Under review]
- **KC, M. B.,** Song, Z., Park, K., Chamberlin, B. & Christinsen, K. (2025). Household Residential Location Choice Modeling for People with Disabilities in Utah [under review]

RESEARCH PROJECTS

- INtermodal Freight Optimization for a Resilient Mobility Energy System (INFORMES), Advanced Research Projects Agency-Energy's (ARPA-E), **US Department of Energy (DOE) @ National Renewal Energy Laboratory**, Denver Colorado, USA
- *Route Optimization, On-route Charging and V2G Integration on Transportation thrust for* **ASPIRE** (Advancing Sustainability through Powered Infrastructure for Roadway Electrification) **National Science Foundation (NSF) Engineering Research Center**, Logan, Utah
- *Increasing Affordability, Energy Efficiency, and Ridership of Transit Bus Systems through* ***Large-Scale Electrification***, **US Department of Energy (DOE)**
- Systems and Modeling for Accelerated Research in Transportation **SMART 2.0,** Vehicle Technologies Office**, US Department of Energy (DOE) @ National Renewal Energy Laboratory**, Denver CO

- *Feasibility Analysis of Electric Roadways Through Localized Traffic, Cost, Adoption, and Environmental Impact Modeling*, **ARPA-E, DOE**
- *Investigating the Feasibility of Introducing Alternative Fuel Vehicles into Maintenance Fleet*, **Utah Department of Transportation (UDOT)**
- *Enhancement in **4-step Travel Demand Modeling considering individuals with disabilities incorporating physical community and environmental context**,* Funded by **National Institute on Disability, Independent Living, and Rehabilitation Research (NiDILRR)**

TEACHING EXPERIENCE

- **Assistant professor, Pokhara University, Nepal: 2020-2021**
  - Project planning & Control, Graduate Course – achieved 100% pass rate for MSc 1st semester
- **Lecturer, Tribhuvan University, Nepal: 2013-2014**
  - Transportation Engineering, Undergraduate Course – improved pass rates than in previous year
  - Supervised 2 Undergraduate Final projects as a part of graduation requirement
- **Teaching Assistant, Utah State University, USA: 2021-2024**
  - Provided feedback to students on assignments in class and in office hours

COMPUTER SKILLS

- **Programming:** Python, R, GAMS, Gurobi
- **Mapping and Visualization Software:** ArcGIS Pro, QGIS, ArcPy, matplotlib, seaborn
- **Machine/Deep Learning Frameworks**: SVM, SVD, DQN
- **Transportation demand modeling:** CUBE, Synchro, TransCAD
- **Project management software:** Microsoft Project
- **Others:** Jupyter**,** Pandas, NumPy, scikit-learn, Web scraping, NLP and LLM

CERTIFICATIONS & LICENCES

- Fundamentals of Engineering (FE) Civil Exam, NCEES, since 2025
- General Engineer, Civil, Nepal Engineering Council (NEC), since 2015

PROFESSIONAL AFFILIATIONS

- Member, TRB Standing Committee on Transit Operations (AP014), 08/2025-04/2028
- Member, TRB Standing Committee on Bus Transit Systems (AP050), 2025-2025
- Member, TRB Sub-committee on Freight Modeling (AT015(1)), 2023-2025
- Member, American Society of Civil Engineers (ASCE), 2025-2026
- Student member, Institute of Transportation Engineers (ITE), 2023-2025

LEADERSHIP ACTIVITIES

- Member, Tau Beta Pi, Utah Gamma Chapter, 2023-2025
- Member, Student Library Advisory Board, USU, 2023/24
- Utah State University Graduate Student Council (GSC), 2023/2024
- Secretary, ITE-USU chapter 2022/23, Logan, Utah
- Secretary, Ministerial level Nepal Civil Employees Union, Ministry of Physical Infrastructure & Transport (MoPIT), 2019-2021, Nepal
- Advisor, Nepal Student Union (NSU), Lumbini Engineering College chapter, 2018-2020, Nepal
- Polling Officer, House of Representative Election, 7 December 2017 at Rupandehi District
- Polling & Counting Officer, Local Body Election at Kapilvastu District, 28 June 2017
- Vice-President, Civil Engineering Student Society-Nepal (CESS), 2012/2013, IOE Pulchowk, Nepal

AWARDS

- **Winner** - Institute of Transportation Engineers (ITE) Student Research Presentation Competition, Utah, 2024
- **Winner** - Prakash S Lad Scholarship for Courage and Perseverance in the College of Engineering (ENGR), Utah State University, 2023 ($2000.00)
- Best student term project on data science in practice titled "*Fake News Detection: Investigating ChatGPT."*
- **Dean listed and University topper** in MSc Construction Management, Pokhara University, 2021
- **Outstanding MSc Student of the Year**, Lumbini College of Engineering and Management, Pokhara University, 2019.
- Ranked top 4 in BE, Civil Engineering, Tribhuvan University (TU), 2013
- Merit-based government scholarship (2009-2013) by the institute of Engineering, Nepal

PEER-REVIEWED CONFERENCE PRESENTATION

17. KC, M. B., Song, Z., Park, K., Chamberlin, B. & Christinsen, K. (2025). Household Residential Location Choice Modeling for People with Disabilities in Utah. *ASCE International Conference on Transportation* Development, June 6-8, 2025, Arizona, USA (Accepted)

16. KC, M. B., & Song, Z. (2024). Multi-Stage, Multi-School Electric Bus Routing and Scheduling Optimization Using Metaheuristics. *Transportation Research Board (TRB) Annual Meeting, January 5-9, 2025*, Washington DC

15. KC, M. B., & Song, Z. (2024**)**. Integrated Optimized Charging and Economic Analysis of V2G Enabled School Bus System. *Transportation Research Board (TRB) Annual Meeting, January 5-9, 2025*, Washington DC

14. KC, Megh and Song, Ziqi (2024), " Inclusive Transport Policy: Mode Choice Behavior of People with Disabilities in Utah," *2024 ITE Mountain District Annual Meeting, Big Sky, Montana*, 19-21 June 2024 (Accepted)

13. KC, Megh; Song, Ziqi; Park, Keunhyun and Keith Christinsen (2024), "Inclusive Transportation System and Understanding Mode Choice Behavior of People with Disabilities: A Case Study in Utah", *6-Minute Showcase for the 2024 TRB Annual Meeting as part of the Young Member Council - Sustainability and* Resilience, Washington DC (awarded as recognized presentation)

12. KC, Megh and Song, Ziqi (2024), "Evolving School Transportation: A Comprehensive Approach to Bus Electrification with Dynamic Route Optimization and Partial Charging for Mixed Fleets", *Transportation Research Board (TRB) Annual Meeting, January 7-11, 2024*, Washington DC

11. KC, Megh; Song, Ziqi; Park, Keunhyun and Keith Christinsen (2024), "Understanding Mode Choice Behavior of People with Disabilities: A Case Study in Utah", *Transportation Research Board (TRB)* Annual Meeting, January 7-11, 2024, Washington DC

10. KC**, Megh** and Song, Ziqi (2023), "School Transportation Electrification: Simultaneous Route Optimization, Timetabling, and Partial Charging for Mixed Fleet," *2023 ITE Mountain District Annual Meeting, St. George, Utah*, 21-23 June 2023

9. KC, Megh and Song, Ziqi (2023), "Electric School Buses: Optimal Routing and Partial Charging," *USU* Student Research Symposium 2023, Logan, 12 April 2023

8. KC, Megh and Song, Ziqi (2023), "School Bus Electrification: Route Optimization, Timetabling, and Partial Charging," *College of Engineering Research Week, USU, Logan,* 4 April 2023.

7. National Academies: Sciences, Engineering, and Medicine (NASEM) Transportation Research Board (TRB) Annual Meeting, January 8-12, 2023, Washington DC

6. Utah Department of Transportation (UDOT) Annual Conference, October 25-27, 2022, Mountain

America Exposition Center in Sandy, Utah
5. ASPIRE (Advancing Sustainability through Powered Infrastructure for Roadway Electrification) ERC Annual Meeting, October 17-19, 2022, ASPIRE Center in Logan, Utah
4. National Academies: Sciences, Engineering, and Medicine (NASEM) Transportation Research Board (TRB) Annual Meeting, January 9-13, 2022, Washington DC
3. LEC Web-Based First International Conference on Engineering and Technology, 4 December 2021
2. Utah Department of Transportation (UDOT) Annual Conference, October 26-28, 2021, Mountain America Exposition Center in Sandy, Utah
1. International Conference on Sustainable Development (ICSD 2019), May 1-3, 2019, Pokhara Nepal

RESEARCH OUTREACH ACTIVITIES

10. Reviewer: *International Journal of Transportation Engineering and Technology (IJTET)*
9. Reviewer: *Journal of Transportation System and Engineering (JoTSE)*
8. Reviewer: *Energy 360*
7. Reviewer: *Transportation Research Record, Journal of Transportation Research Board*
6. Reviewer: *Transportation Research Board Annual meeting, 2025*
5. Reviewer: *Transportation Research Board Annual meeting, 2024*
4. Reviewer: *Transportation Research Board Annual meeting, 2023*
3. Reviewer: *Transportation Research Board Annual meeting, 2022*
2. Reviewer: *East African Scholars Journal of Economics, Business and Management*
1. Reviewer: *LEC Web-Based First International Conference on Engineering and Technology*

RESEARCH INTERESTS

- **Operation Research:** Application of operation research on Transportation systems, EV routing and Charging infrastructures, Optimization, Freight Transportation Modeling, Metaheuristic algorithms
- **AI/RL/DRL in Transport Operation of Electric Buses/Public Transit**
- **Data Science/ Quantitative analytics:** Machine Learning, Data Visualization, Statistical Methods & Data Analysis
- **Integration of Optimization & Data Science to Improve Transportation System Efficiency**
- **Travel Demand, Travel Behavior & Discrete Choice Modeling**

PEER-REVIEWED JOURNAL ARTICLES (ROLE: REVIEWER)

10. Reinforcement Learning for Charging Infrastructure Planning and Scheduling Problems in Battery Electric Bus System. *Energy 360.*
9. Empowering Africa to Transition from Consumer to Producer of Technology: Challenges and Opportunities. *International Journal of Transportation Engineering and Technology (IJTET).*
8. Application of Dijkstra's Algorithm in Finding the Shortest Road Alignments. *Journal of Transportation System and Engineering (JoTSE).*
7. Vehicle-to-grid enabled charging infrastructure planning and operations considering demand uncertainties. *Transportation Research Part D: transport and Environment.*
6. A Two-Stage Stochastic Model for Road-Rail Intermodal Freight Transport with Carbon Emission Reduction, *Transportation Research Board Annual Meeting 2025 & Transportation Research Record.*
5. Electric Vehicle Routing Problem with Drones Considering En-route Charging and Solution Algorithm. *Transportation Research Board Annual Meeting 2024 & Transportation Research Record.*
4. Optimal En-Route Charging Station Locations in Highway Networks: Minimizing Required Networkwide Driving Ranges of Electric Vehicles. *Transportation Research Board Annual Meeting 2024*

& Transportation Research Record.

3. Industry Insights about Traffic Sensors for Freight Data using Natural Language Processing. *Transportation Research Board Annual Meeting 2024 & Transportation Research Record.*

2. Bayesian Optimization for Battery Electric Vehicle Charging Station Placement by Agent-based Demand Simulation. *Transportation Research Board Annual Meeting 2023 & Transportation Research Record.*

1. Identifying the Electricity-saving Driving Behaviors based on Trip-level Electricity Consumption of Electric Bus: A Machine Learning Approach. *Transportation Research Board Annual Meeting 2023 & Transportation Research Record.*