

## Education

- **University of Tennessee, Knoxville** Aug 2023 – Present  
Ph.D. in Computer Science, GPA: 3.83/4.0  
TN, USA
- **University of Memphis** Aug 2019 – May 2023  
M.S. in Computer Science, GPA: 4.0/4.0  
TN, USA

## Publications

- **B. Poudel**, W. Li, Kevin Heaslip. “EnduRL: Enhancing Safety, Stability, and Efficiency of Mixed Traffic Under Real-World Perturbations Via Reinforcement Learning.” *IEEE International Conference on Intelligent Robots and Systems (IROS)* 2024.
- M. Villarreal, **B. Poudel**, R. Wickman, Y. Shen, W. Li, “AutoJoin: Efficient Adversarial Training for Robust Maneuvering via Denoising Autoencoder and Joint Learning.” *IEEE International Conference on Intelligent Robots and Systems (IROS)* 2024.
- **B. Poudel**, W. Li, Suhai Li. “CARL: Congestion-Aware Reinforcement Learning for Imitation-based Perturbations in Mixed Traffic Control.” *IEEE International Conference on CYBER Technology in Automation, Control, and Intelligent Systems (CYBER)* 2024. Nominated to “**Best paper in the conference**” award.
- M. Villarreal, **B. Poudel**, J. Pan, W. Li. “Hybrid Traffic Control and Coordination from Pixels.” *IEEE International Conference on Robotics and Automation (ICRA)* 2023.
- M. Villarreal, **B. Poudel**, W. Li. “Can ChatGPT Enable Intelligent Transportation Systems? The Case of Mixed Traffic Control via Reinforcement Learning.” *IEEE Intelligent Transportation Systems Conference (ITSC)* 2023.
- R. Wickman, **B. Poudel**, M. Villarreal, X. Zhang, W. Li. “Efficient Quality-Diversity Optimization through Diverse Quality Species.” *ACM Genetic and Evolutionary Computation Conference (GECCO)* 2023.
- **B. Poudel**, T. Watson, W. Li. “Learning to Control DC Motor for Micromobility in Real Time with Reinforcement Learning.” *IEEE Intelligent Transportation Systems Conference (ITSC)* 2022.
- **B. Poudel**, W. Li. “Black-box Adversarial Attacks on Network-wide Multi-step Traffic State Prediction Models.” *IEEE Intelligent Transportation Systems Conference (ITSC)* 2021.

## Preprints

- **B. Poudel**, L. Zhu, W. Li. “Co-design of Adaptive Controller for Pedestrian and Vehicular Traffic Management in Urban Environments.” *In preparation.*
- A. Zahid, **B. Poudel**, D. Scott, S. Crouter, J. Scott, W. Li., S. Swaminathan. “PulseRide: A Robotic Wheelchair Platform for Personalized Mobility Assistance using Human-in-the-Loop Reinforcement Learning.” *In preparation.*

## Professional Experience

- **Graduate Research Assistant** Aug 2023 – Present  
*Department of Electrical Engineering and Computer Science, University of Tennessee*  
Research interests: Application of Reinforcement Learning in autonomous systems such as multi-agent simulation and real-world robots. My most recent project focuses on improving health and physiological outcomes in wheelchair users, while another project on reducing travel time for both vehicles and pedestrians in urban environments.
- **Graduate Teaching Assistant** Aug 2019 – May 2023  
*Department of Computer Science, University of Memphis*

Delivered lectures, developed programming assignments, and graded submissions in graduate and undergraduate courses.

### Lectures:

1. “Introduction to Transformers.” [Slides](#). Machine Learning (Spring 2023).
2. “Optimization and Stochastic Gradient Descent.” [Slides](#). Artificial Intelligence (Spring 2023), Machine Learning (Spring 2023), Intro to Neurocomputing (Fall 2020, Fall 2021).
3. “Introduction to Adversarial Machine Learning.” [Slides](#). Intro to Neurocomputing (Fall 2021).

**Assignments:** Various AI and ML related topics including Recurrent and Convolutional Neural Network training, Reinforcement Learning algorithms such as DQN and PPO, and finetuning of BERT Transformer. [GitHub Repository](#).

**Teaching Assistance:** Courses covered include Software Engineering, Database Systems, Artificial Intelligence, Data Mining, Machine Learning, and Advanced Machine Learning.

## Concurrent Projects

- [“DocuMint: Docstring generation for Python using Small Language Models.”](#) Benchmarked small language models on the quality of their generated docstrings, created a fine-tuning dataset using the FOSS ecosystem, and fine-tuned Google’s CodeGemma. Released the dataset and the fine-tuned model in [HuggingFace](#).
- [“BarterBaron, A Commerce App Based on Barter System.”](#) Engineered an eBay-like commerce platform based on barter system using Ruby on Rails with features like chat, search, and secure user authentication. Won **“Best project in the class”** award, COMP 7012 Software Engineering, University of Memphis.
- [“Robustness to Input Corruptions and Adversarial Examples in Steering Angle Prediction.”](#) Used self-supervised learning to enhance robustness of computer vision models in steering angle prediction, under natural disturbances to camera such as rain, snow, fog, frost, pixelation, and blur. [Presentation Video](#).
- [“Latent Representation of Inputs: A Defense Against Adversarial Examples in Deep Q Networks.”](#) Used feature squeezing to improve the adversarial robustness of DQN algorithm trained to play Atari Pong.
- [“Distributed Hyperparameter Tuning of Neural Networks.”](#): Accelerated the hyperparameter tuning (grid and random search) of Multi Layered Perceptrons by upto 80%. Parallellized search objective using Distributed Hash Table, utilizing computational resources in multiple nodes.

## Technical Skills

- **Data Analysis:** Proficient in the data analysis pipeline including data cleaning, exploration, visualization, and statistical analysis. Skilled in NumPy, Scikit-Learn, Pandas, Matplotlib, and Seaborn.
- **Modeling and Frameworks:** Proficient in building, training, and validating machine learning models, utilizing frameworks such as PyTorch, TensorFlow, and Keras, and HuggingFace.
- **Experimentation:** Skilled in virtualization tools like Conda and Venv. Proficient in managing and distributing experiments across multiple systems, and in experiment tracking and visualization with tools such as Weights & Biases.
- **Languages and OS:** Skilled in Python, C++, and LaTeX. Experienced with Linux (including shell scripting, software installations, package management), MacOS, and Windows.
- **Design and Hardware:** Proficient with Adobe Illustrator and the Sketch app. Experienced with hardware programming with Arduino.

## Awards & Honors

- Travel Grant, Department of Electrical Engineering and Computer Science, UTK, 2023
- Travel Grant, Department of Computer Science, U of M, 2021
- “Best project in the class” award for BarterBaron, COMP 7012 Software Engineering, U of M, 2021
- Merit based scholarship (top 5% of the class in semesters 1, 2 & 3), TU

## Academic Service

- **Reviewer:**
  1. IEEE International Conference on Intelligent Robots and Systems (IROS) 2022, 2023
  2. Robotics: Science and Systems (RSS) 2023
  3. IEEE Robotics and Automation Letters (RA-L) 2022, 2024
  4. ICLR Workshop on Generalizable Policy Learning in the Physical World 2022
  5. IEEE International Conference on Robotics and Automation (ICRA) 2021

## Professional Membership

- IEEE student member
- Nepal Engineering Council

## Personal Interests

- **Hobbies:** Gardening, Cooking, Movies, and Swimming