

Education

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

Publications

- **B. Poudel**, W. Li, K. 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, S. 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 for “**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, K. Heaslip. “Simultaneous Design and Control for Vehicular and Pedestrian 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.*

Experience

- **Graduate Research Assistant** Aug 2023 – Present
Fluidic City Lab & Center for Transportation Research, UTK
Research: Application of Reinforcement Learning in autonomous systems such as multi-agent simulation and real-world robots. Most recent project focuses on improving health and physiological outcomes in wheelchair users, providing them with adaptive assistance based on heart rate and velocity input.
- **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.

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%. Paralellized 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

Personal Interests

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