WOOSEOK KIM

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EDUCATION

Sangmyung University; Seoul, Republic of Korea.   March 2019 - February 2025

B.S. Computer Science

San Jose State University; San Jose, California, United States.   July 2024 - August 2024

Certificate of Achievement: Silicon Valley Software Technology & Artificial Intelligence Program

RESEARCH INTERESTS

Decision-Making Systems, Robotics, Reinforcement Learning, Applied Machine Learning

RESEARCH EXPERIENCES

Undergraduate Research Intern   June 2023 - Present

Network Information Systems Lab, Sangmyung University

- Advisor: Professor KyungSeop Shin
- Conducted research on a NOMA communication system using Python and a custom PyTorch reinforcement learning environment, culminating in a first-author journal paper published in a SCOPUS-indexed journal, titled "Optimal Power Allocation and Sub-optimal Channel Assignment for Downlink NOMA System Using Deep Reinforcement Learning". The paper demonstrates a 39% improvement in joint resource allocation performance using policy gradient reinforcement learning method.
- Performed analytical comparisons of Uncertainty Quantification techniques driven by Bayesian methods, applied to NASA's CMAPSS turbofan engine degradation dataset, and wrote a technical report presenting the performance evaluation.
- Enhanced a personal project on autonomous vehicle simulation by implementing policy-based motion planning using Deep Reinforcement Learning and led seminars for lab members.
- Currently developing a Transformer-based model using Python, PyTorch and PyTorch Lightning to predict battery remaining useful life. Designed the model through PCC analysis of the battery dataset with NumPy and pandas to enhance predictive accuracy and input state efficiency.

PERSONAL PROJECTS

- Developed a Super Mario Bros. agent using Double DQN with Python, PyTorch, and Gymnasium environment, achieving human-level playtime performance of 30 seconds.
- Developed an autonomous vehicle simulation with Linear Interpolation-based sensors in vanilla JavaScript. Applied transfer learning from obstacle detection to lane detection, achieving up to 20% reduction in lane deviations.

COURSEWORK PROJECTS

- Built an RNN model for classifying IMDB movie reviews as positive or negative, using a custom scraper to collect and preprocess the dataset.
- Built a GAN model for image generation, experimenting with different loss functions and optimizers to observe their impact on performance.
- Built a CNN model for MNIST dataset classification, analyzing the effects of convolution operations on model performance.
- Built an Autoencoder model for MNIST dataset generation and classification, analyzing limitations in generating simple images and optimizing the model to generate more complex images by increasing model capacity and latent space size.
- Built Multi-Layered Perceptron models for MNIST dataset classification, using both PyTorch and a custom implementation.

TECHNICAL SKILLS

- Programming Languages: Python, C, Java, C++, Rust
- Machine Learning Frameworks: PyTorch, PyTorch Lightning
- Tools: Linux, Git, Docker, Anaconda, LaTeX

HONORS AND AWARDS

Academic Scholarships for Computer Science (Sangmyung University)	2019, 2022, 2023, 2024
Outstanding Program Performance (San Jose State University)	August 2024
Entrepreneurship Award (San Jose State University)	August 2024
Outstanding Computer Science Graduation Project Exhibition Award (Sangmyung University)	November 2024
Fourth Prize in Capstone Design Competition (Sangmyung University)	December 2024
Software Talent Scholarship (Sangmyung University; SW-Centered University Project Group)	December 2024

OTHERS

Military Service   April 2020 - October 2021

Korean Augmentation to the United States Army (KATUSA)

- Certificate of Achievement: Excellence Award in Combined Command Post Training (U.S. Army)
- The Army Commendation Medal: Outstanding Service in Translation & Interpretation (U.S. Army)