Kyung Min (Brian) Ko

[U.S. Permanent Resident]
https://ko120.github.io | ko120@purdue.edu | LinkedIn | Github |

Education

University of Washington, Seattle Sep 2025 - June 2027
Master of Science in Electrical and Computer Engineering *(thesis track)* **GPA: –**

Purdue University, West Lafayette Aug 2019 - May 2024
Bachelor of Science in Electrical Engineering, graduated *with distinction* **GPA: 3.94/4.00**

- *Leave of absence for military service for 2 years*
- TA: ECE 570 Artificial Intelligence **(graduate)**, ECE 20875 Python for Data Science, ECE 20007
- Coursework: Artificial Intelligence **(graduate)**, Statistical Machine Learning **(graduate)**, Natural Language Processing **(graduate)**, Digital Signal Processing **(graduate)**, Probabilistic Method

Research interest

Truthyworthy Machine learning, Reinforcement Learning, LLM

Publication

Brian Ko, Jim Lim, Ziyu Gong, David Inouye. A Unified Framework for Comparing Distribution Matching Methods Across Trustworthy Machine Learning Tasks. *Submitted to AISTATS 26* [Paper].

Brian Ko*, Han Wang*, Haoyu Li, Huan Zhang. On The Fragility of Benchmark Contamination Detection in Reasoning Models. *Submitted to ICLR 26* [Paper].

Brian Ko. Backward Curriculum Reinforcement Learning. *IEEE RO-MAN (Oral), 2023* [Paper].

Brian Ko. V-advCSE: Virtual Adversarial Contrastive Learning for Sentence Embeddings. *Pre-print, 2023* [Paper].

Brian Ko, Nan Jiang, Lin Tan. Exploiting Code Language Models and Contrastive Learning in Binary Code Authorship. *Pre-print, 2023* [Paper].

Experience

Research Assistant Aug 2024 - Present
UIUC (remote), Champaign, IL. ***Advised by Prof. Huan Zhang*** **Submitted to ICLR 26**

- Collected long CoT training data for supervised fine-tuning of an LLM to experiment with the effect of length distribution
- Analyzed the effect of benchmark contamination by training with the QwQ-32B distilled benchmark trajectory and found that including the benchmark improved performance by average of 10% on complex math and science reasoning benchmarks
- Revealed that GRPO can conceal the contamination evidence with providing theoratical evidence

Research Assistant May 2024 - Present
Purdue University, West Lafayette, IN. ***Advised by Prof. David I. Inouye*** **Submitted to AISTATS 26**

- Conducted research focusing on critical aspects of trustworthy machine learning, including calibration, domain adaptation, and fairness.
- Developed a unified framework for trustworthy distribution matching, incorporating methods such as Sinkhorn, MMD, and adversarial learning to address calibration, domain adaptation, and fairness tasks.
- Demonstrated the effectiveness of various DM methods for calibration, domain adaptation, and fairness, providing practical insights into selecting appropriate DM methods.

NSF Summer Undergraduate Research Intern [Paper & Code] May 2023 - Jan 2024
Purdue University, West Lafayette, IN. ***Advised by Prof.Lin Tan***

- Discovered the application of code language models for malware author classification
- Engineered a novel approach for function-level learning, transitioning from traditional file-level input
- Incorporated contrastive learning methodologies to address code authorship tasks, eliminating the need for labels

Human Resource Manager Nov 2021 - May 2023
Republic of Korea Army, South Korea

- Optimized the boundary protection schedule system by automating processes with programming
- Facilitated proper troop assignments by documenting the transferring process, considering current unit status
- Recognized for developing an AI object tracking system used in the guardroom, awarded by the chief of the general staff of the army

NSF Summer Undergraduate Research Intern [Code] Jun 2021 - Jan 2022
Georgia Tech, Georgia, Atlanta. ***Advised by Prof.Siva Theja Maguluri*** **IEEE ROMAN (Oral) 23**

- Implemented REINFORCE, A2C, and PPO algorithms applicable to both continuous and discontinuous action spaces
- Proposed a novel backward curriculum learning, enhancing sample efficiency via reverse order training
- Evaluated performance on different architecture settings to provide insight on choosing proper architecture

Projects

Guardroom Object Tracking System [Code] Jun 2022

Awarded commandment by the chief of the general staff of the army

- Developed a multi-object tracking system using Yolo-v4 and Deep Sort for automated CCTV surveillance in guardrooms
- Enhanced unit security by tracking objects entering selected regions and calculating real-time moving average distances to display object trajectories

Teaching Experience

Teaching Assistant – ECE 20007 [course description] Fall 2020 – Spring 2021

Purdue University, West Lafayette, IN **Electrical Engineering Fundamentals I Lab**

- Led weekly lab sections for **30** students with a GTA; demoed instrumentation (oscilloscope, function generator) and guided teams through circuit debugging.
- Graded lab reports using a rubric focused on experimental rigor and data visualization; delivered line-item feedback for future improvement.

Teaching Assistant – ECE 20875 [course description] Fall 2023

Purdue University, West Lafayette, IN **Python for Data Science**

- Developed and refined homework sets on **data science**, **data structures**, and **Python programming**.
- Graded exams/homework for **126** students on **Gradescope**; held **12 hrs/wk** office hours and resolved questions in person and on Piazza.

Teaching Assistant – ECE 57000 (Graduate) [course description] Spring 2024

Purdue University, West Lafayette, IN **Artificial Intelligence**

- Designed exams with the GTA and professor; proctored and graded midterms/finals for **270** graduate students using **Gradescope**.
- Improved homework problems in **optimization** and **machine learning**; provided reference code in **PyTorch**.
- Ran weekly office hours **12 hrs/wk** to debug proofs and code; created reusable walkthroughs for recurring conceptual hurdles.

SKILLS

Programming Languages: Python, C++, Java

Software: Pytorch Lightening, Hydra (for ML experiment), TensorFlow

Honors

Dean's List & Semester Honors All semester

NSF Summer Research Fellowship 2021,2023