Yongjin Han

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RESEARCH INTERESTS

My main research interests lie in **certified/adversarial robustness through formal methods and optimization techniques**. In parallel, I am also exploring **efficient AI approaches** such as quantization, pruning, PEFT, since security mechanisms often compromise user availability and practicality. Ultimately, I aim to balance robustness and efficiency in AI systems, enabling users to leverage trustworthy AI technologies in real-world applications.

EDUCATION

University of California, Davis *Master's Degree in Computer Science* Mar 2024

Dongguk University *Bachelor's Degree in Computer Science and Engineering* Feb 2021

PAPER AND CONFERENCE

[Under review] **Han, Yongjin**, and Suhyun Kim. Lipschitz-aware Linearity Grafting for Certified Robustness. 2025. arXiv, arXiv:2510.25130, https://arxiv.org/abs/2510.25130.

[KOR] **Han, Yongjin**, Soo-Lyn Choi, Sun-Young Ihm, and Yunsik Son, "A Predictive Policing with Epidemic Type Aftershock Sequence Model," In Proceedings of the 2nd International Conference on SMART Policing Convergence, Seoul, Oct 22, 2020.

[KOR] **Han, Yongjin**, Soo-Lyn Choi, JoongYeon Lim, Sun-Young Ihm. "A Research on the Prediction of Outside Accident of the Troops based on Earthquake Analysis Model." Korean Journal of Military Art and Science. Vol 76.3. pp 119-144. 2020.

[KOR] **(Best Paper) Han, Yongjin**, Seokmin Chang, Yunsik Son. "A Study on the Virtual Machine Performance Optimization Using Lazy Evaluation." Korea Multimedia Society Conference. Aug 11, 2020.

RESEARCH AND PROJECT

Deep Fair Clustering with Integer Linear Programming Jul 2022 - Mar 2024

- Enforced a notion of fairness to a deep clustering model based on DEC to make it fair using an ILP solver, GurobiPy
  - Formulated a group fidelity (predictive parity) into ILP formula
  - Encoded ILP formula as a fairness signal for a deep learning model
- Finetuned parameters for training a model implemented with PyTorch

Automated Debugging with Program Synthesis and Fault Localization Mar 2020 - Feb 2021

- Managed the project and team of 4 people as a leader
- Implemented a program synthesizer from scratch to fix a localized bug code using an SAT/SMT solver, Scalar Z3
  - Designed a Turing complete Domain Specific Language (DSL)
  - Converted a code into first-order logic (FOL) formula following Hoare logic
  - Found a fixed code snippet from program space by verifying the FOL formula with Scalar Z3

Distributed Virtual Machine and the Intelligence Offloading Method for A Smart Edge Computing Mar 2020 - Feb 2021

- Studied a structure of VM and an offloading method
- Proposed an idea about an optimization method
  - Used lazy evaluation for an asynchronous system to postpone unnecessary evaluations

Smart Community Policing system Mar 2020 - Feb 2021

- Developed predictive policing system with Epidemic Type Aftershock Sequence (ETAS) model and machine learning
- Designed a crime magnitude scoring model with open data from LAPD by considering crime events as earthquake events

Reduction in test case to evaluate and improve performance of static analyzer Mar 2020 - Feb 2021

- Studied how released static analyzers detect vulnerabilities (CWE120, 134)

PROFESSIONAL EXPERIENCE

KDST lab at Kyung Hee Univ. (prev. at KIST) | *Research Member* June 2024 - Present

- Study certified and adversarial robustness
- Study model compressions (pruning, quantization) and parameter-efficient fine-tuning (PEFT)

Ian Davidson's AI/ML Lab at UC Davis | *Research Member* Jul 2022 - Mar 2024

- Studied fairness in AI/ML (deep clustering) and constraint programming

Korean Graduate Student Association at UC Davis | *Vice President* Sep 2022 - Mar 2024

- Organized events for Korean graduate students (+150 MS, PhD, Post-doc, Visiting scholar)
- Got sponsorship from various organizations

Programming Language and Secure Software Lab at Dongguk University | *Research Member* Jul 2019 - Feb 2021

- Researched programming language (program synthesis, compiler, VM, program analysis, etc) and secure software

CERT (Computer Emergency Response Team) at Republic of Korea, Army | *Team Member* Aug 2017 - May 2019

- Monitored traffic, intrusion detection logs such as DDOS, spoofing, and viruses
- Dealt with computer emergent accidents
- Audited soldiers (from staff sergeant to lieutenant colonel) whether they consistently comply with security rules or not

BOOK TRANSLATION

Jack Widman. (2024). [KOR] Learning Functional Programming. (Jinho Lee, **Yongjin Han**, Trans.). Acorn Publishing Co. (Original work published 2023)

HONORS & SCHOLARSHIP

Senior scholarship | *Introduction to the Capstone Design Course 1 at Dongguk University* 2020

Best paper | *Summer Conference, Korea Multi Media Society, Korea Federation of Information Technology Societies* 2020

Silver prize | *Programming Contest at Dongguk University* 2017

Bronze prize | *Programming Contest at Dept of CSE, Dongguk University* 2016

TEACHING EXPERIENCE

TA | *AI100200 (AI Programming) @ KyungHee University* 2025

Class Tutor | *Compiler Construction, Programming Language and Theory* 2020

SERVICE

Mentor | *Academic and Emotional Support Mentor Volunteer for K-12 students @ Yeongtong Social Welfare Center* Present

PATENT

Dongguk University Industry-Academic Cooperation Foundation (2020). KR Patent No. 1020200176727. Korea Intellectual Property Right Information System.

SKILL

Programming language

- C/C++, Python, R, Scala, Java

Constraint programming solver

- Z3, Gurobi

Framework

- LLVM, PyTorch

LICENSE

Industrial engineer information secuirty | *Korea Internet & Security Agency* 2016