Yannan Li
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EDUCATION

Ph.D., Computer Science *2018 - 2023*
University of Southern California (USC)
GPA: 3.78/4.0

B.E., Computer Science *2013 - 2017*
University of Science and Technology of China (USTC)
GPA: 3.84/4.3   Rank: 7/109

Relevant Coursework: Advanced Algorithm, Advanced Program Analysis and Verfication, Formal Method for Robotics, Data Structure, Operating Systems, Computer Architecture, Computer Network, Computer Organization, Compilers, Parallel Computing, Introduction to Artificial Intelligence

WORKING EXPERIENCE

[Google Intern] Explored a new feature for Nest Camera *May - Aug 2022*
- *Designed, implemented, tested, tuned different machine learning (ML) algorithms*
- *Demonstrated the feasibility of this new feature via experiment results*
- *Actively discovered and solved side problems during the exploration*

PROJECT EXPERIENCE

Privacy-Preserving Image Trading through Crowdsourcing *2016 - 2017*
- *Led a five-member team*
- *Designed a privacy-aware image trading system based on crowdsourcing*
- *Designed an image selection method, which first uses a pre-trained CNN model to extract features, then uses an autoencoder to reduce feature dimensions, and uses clustering to help select images*
- *Minimized computation and communication overhead in both servers and clients sides*

Verifying the Robustness of KNNs against Data-Poisoning Attacks *2019 - 2021*
- *Proposed a method for soundly over-approximating the KNN behaviors during both parameter tuning and prediction phases under data-poisoning attacks*
- *Used the histogram of oriented gradients (HOG) to extract the features for MNIST and CIFAR10*
- *Developed optimizations to prune the search space while maintaining accuracy*
- *Experiments show the high accuracy and high efficiency of our methods on both small and large datasets*

Schedule Multi-Robot Systems using Sound Deadlock Detection *Jan-May 2021*
- *A course project of 'Formal Methods for Robotics', advised by Prof. Jyotirmoy V. Deshmukh*
- *Designed a scheduling algorithm with reduced computation cost and increased robot utilization*
- *Applied the newest deadlock prediction method for coordination efficiency and effectiveness*

Constraint-Based Precomputation on Energy-Harvesting Devices *2018 - 2019*
- *Developed a sound static analysis to identify precomputation opportunities*
- *Used an SMT solver based method to optimize the precomputation policy*
- *Applied a semantic-preserving transformation to generate the optimized program*
- *Implemented our method in the LLVM compiler*

Game: Cooking Journey *Aug-Dec 2019*
- *Wrote a game, Cooking Journey, combing both cooking and racing games using Unity*
- *Course Project of 'Advanced Mobile Devices and Game'*
- *Collaborated with other three students Using Bitbucket*
- *Invited by Prof. Mike Zyda to attend USC Games Showcase*

Optimized Distributed Applications *2016*
- *Optimized two classical scientific softwares (Lammps and Splotch) on a ten-node cluster with 3000W power constraint; Ranked 4th in the Final of 2016 International Student Cluster Competition (ISC)*
- *Implemented and optimized a 2-D shortest path algorithm on CPU/GPU heterogeneous platform*

SELECTED PUBLICATION

1. Proving Robustness of KNNs Against Adversarial Data Poisoning
Yannan Li, Jingbo Wang, Chao Wang
*22nd International Conference on Formal Methods in Computer-Aided Design (***FMCAD 2022***)*

2. Falsifying the Robustness of KNNs under Data-Poisoning Attacks
Yannan Li, Jingbo Wang, Chao Wang *(Under Submission)*

3. Constraint-Based Analysis for Energy Optimization via Precomputation
Yannan Li, Chao Wang *(Under Submission)*

4. Fair Decision Tree Learning via Iterative Constraint Solving
Jingbo Wang, **Yannan Li**, Chao Wang
*34th International Conference on Computer Aided Verification (***CAV 2022***)*

5. CrowdBuy: Privacy-friendly Image Dataset Purchasing via Crowdsourcing
Lan Zhang, **Yannan Li**, Xiang Xiao, Xiang-Yang Li, Junjun Wang, Anxin Zhou, Qiang Li
*37th IEEE International Conference on Computer Communications (***INFOCOM 2018***)*

TECHNICAL SKILLS

Programming Languages	C, C++, Python, TensorFlow, Java, Shell, Verilog HDL, HTML
Compile	LLVM, Java Soot (Static Analysis, Program Transformation)
Verification/Synthesis	Z3 (SAT/SMT Solver), SyGus (Program Synthesis)
Game Engine	Unity