XIAXIN SHEN

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EDUCATION

- **Ph.D. in Electrical and Computer Engineering, Princeton University** *2027 (Expected)*
  Second year PhD student *Princeton, NJ 08544*
- **B.S. in Computer Information Technology, Purdue University** *May 2022*
  Graduated with highest distinction (GPA: 3.96 / 4.0) *West Lafayette, IN 47906*

PUBLICATIONS

Refereed Conference Publication

- David J. Richter, Lance Natonski, **Xiaxin Shen**, and Ricardo A. Calix. Attitude control for fixed-wing aircraft using q-learning. In *International Conference on Intelligent Human Computer Interaction (IHCI)*. Springer, 2021
- Upinder Kaur, Haozhe Zhou, **Xiaxin Shen**, Byung-Cheol Min, and Richard M. Voyles. Robomal: Malware detection for robot network systems. In *2021 IEEE International Conference on Robotic Computing (IRC)*. IEEE, 2021

AWARDS

- Gordon Y.S. Wu Fellowship in Engineering *2022*
- Best Session Paper Award in 2021 Springer IHCI (Session Name: Machine Learning for HCI) *2021*
- 3rd Place in the SAE Mobility Forward Challenge: AI Mini-Challenge Competition *2021*
- Award for Best Visualization in Purdue's 7th Annual ASA DataFest Competition *2021*
- Purdue University Dean's List and Academic Honors Certificate *2018 - 2020*
- National-wide: Top 40 and Finalist in the ITA Tech Challenge Programming Competition *2019*

RESEARCH EXPERIENCE

RoboMal: Malware Detection for Robot Network Systems **Mar 2021 - Aug 2021**

- Developed the RoboMal dataset using the controller files of the publicly available autonomous car with Gazebo-based simulation available at GitHub
- Created a total of 450 binary executable and linkable format (ELF) files with 232 malware files and 218 good software files by modifying gains and scalars and manipulating the proportional–derivative (PD) control structure by person
- Identifying the maliciousness of the code with an accuracy of 85% and precision of 87%

Attitude Control for Fixed-Wing Aircraft using Q-Learning **Jan 2020 - Nov 2020**

- Applied algorithms Q-Learning proposed in 1989 to airplane simulator which is available at GitHub
- Utilized Python to work with high dimensional, non-linear and complex tasks with a simulated aircraft Cessna 172 in JSBSim
- Implemented the algorithm for airplane flight based on Q-Learning to make the airplane fly with the goal of maintaining a constant altitude
- Defined a Q-table with the size (states(168), actions(4)) by creating an encoding system by converting discrete action values to continuous values

TEACHING EXPERIENCE

- **ECE 115 Introduction to Computing: Programming Autonomous Vehicles** *2023 Fall*
  Graduate assistant in instruction *Princeton University*

COURSE PROJECTS

Eigenface++: Face Recognition with Deep PCA **2023 Spring**

- Revolutionized PCA into deep PCA by enhancing input matrix diversity through convolution
- Achieved comparable recognition correctness with just 25% of original image data

ControlLoRA++ **2023 Spring**

- Extended ControlLoRA by adding two tasks: scribble and HED with additional datasets: COCO and Waymo

Bitcoin Implementation **2022 Fall**

- Built a simplified Bitcoin client using Rust programming language

SKILLS

- **Python:** Implemented data scraping, XML files parsing, data cleaning, data analytics and model building with TensorFlow and PyTorch
- **C/C++:** Implemented data structure and algorithms by finishing about 150 problems at online judge system
- **Java:** Maintained a Java-based system using the technique of Mybatis, Maven, Spring MVC for knowledge mapping. Implemented parallel programming for operating system. Developed Android App: RLEAM Reader
- **Latex:** Edited paper with IEEE/ ACM/ Springer formats
- **Git:** Version control especially for group projects
- **Tableau:** Visualized and analyzed data in Purdue's 7th Annual ASA DataFest Competition