Ruizhe Wang

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EDUCATION

University of Wisconsin-Madison — Madison, WI
Bachelor of Science *in* ***Computer Sciences*** *and* ***Mathematics****; GPA: 4.0/4.0* — *Sep 2019 – Dec 2021*
- Advisor: Earlence Fernandes
- Honor Degree Candidate

Beijing Institute of Technology — Beijing, China
Bachelor of Engineering *in* ***The Internet of Things Engineering****; GPA: 3.66/4.00 (1/31)* — *Sep 2017 – Jul 2019*

RELEVANT EXPERIENCES

UW-Madison Security and Privacy (Mad S&P) — Madison, WI
Research Assistant — *Nov 2019 – Present*
- Conduct research in the system area, focusing on IoT security and Machine Learning security.

Last Mile Team, Amazon LLC. — Austin, TX
Software Development Engineer Intern — *May 2020 – Aug 2020*
- Co-Implemented a serverless application to increase Amazon package delivery efficiency by automatically providing rescue plans for delayed packages using Typescript and Java.
- Deployed the application on AWS and created four RESTful APIs using Google Guice and AWS CDK
- Fully tested the service with Mockito and JUnit and created AWS Metrics dashboards and thresholds that can automatically fire alarms.

PUBLICATIONS

Yunang Chen, Amrita Roy Chowdhury, **Ruizhe Wang**, Andrei Sabelfeld, Rahul Chatterjee, and Earlence Fernandes. **Data Privacy in Trigger-Action Systems.** In *IEEE Symposium on Security and Privacy (S&P) (Oakland),* 2021

Yuzhe Ma, Jon Sharp, **Ruizhe Wang**, Earlence Fernandes, and Xiaojin Zhu. **Sequential Attacks on Kalman Filter-Based Forward Collision Warning Systems**. In *The Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI)*, 2021

SELECTED PROJECTS

Black-Box Physical Attack on Smart Cameras — Madison, WI
Dec 2020 - Present
- Evaluate the Machine Learning Models and Motion Detectors of popular commercial smart cameras.
- Create a physical black-box attack to compromise these smart cameras to prevent detecting intruders and triggering intrusion alarms.

Adversarial Attacks on Kalman Filter Based Autopilot System — Madison, WI
Apr 2020 - Present
- Co-Proposed a Model Predictive Control algorithm to compute the optimization approach to compromise a Machine-Human Hybrid Forward Collision Warning System by causing the Kalman Filter give false state estimations.
- Evaluated the attack on CARLA driving simulator and designed two dangerous situation that could cause collisions after attack.

- Create an End-to-End white box attack on Openpilot autopilot system which has equivalent performance as Tesla self-driving systems.

Data Privacy in Trigger-Action Platforms Madison, WI
Sep 2019 – Apr 2020

- Co-Proposed a protocol in Trigger-Action Platforms (TAPs) using Garbled Circuits that can avoid leaking sensitive information when the trigger or the platform is compromised.
- Evaluated the efficiency of the new protocol on the rules of popular commercial TAPS (IFTTT & Zapier) using Python Flask. Showed that more than 90% of the top-500 frequency rules are supported while the latency and throughput reduced less than 60%.

Online Used Book Transaction System Madison, WI
Sep 2020 – Sep 2020

- Co-Implemented an online system using React, Typescript and Flask for students to sell and buy used books that can help students save ~74% money comparing with purchasing in the Book Store.
- Integrated with AWS Personalize to recommend books and Facebook APIs for authentication.

HONORS & AWARDS

ACM ICPC NCNA Regional 4th position (4/90) *Feb 2021*

CRA (Computing Research Association) Outstanding Undergraduate Researcher Awards Honorable Mention *Dec 2020*

DeWitt Scholarship of Department of Computer Sciences, UW-Madison **($8000)** *May 2020*

Dean's List of College of L&S, UW-Madison *All Semesters*

First-Class Academic Excellence Scholarship of Beijing Institute of Technology **(10%)** *Oct 2018*

3rd Place of Freshman Programming Contest at Beijing Institute of Technology **(3/369)** *Apr 2018*

2nd Price in Lssec Techall Beijing Institute of Technology Programming Contest (~10%) *Apr 2017*

OTHER EXPERIENCES

Coursera Volunteer Translator *Mar 2020 - Present*

Charity Primary School Volunteer Instructor *Mar 2019 – Mar 2019*

SKILLS

- **Languages**: Python, Java, C/C++, JavaScript/TypeScript, SQL, MATLAB, nesC
- **Frameworks/Tools**: Flask, PyTorch, Google Guice, React, Mockito, JUnit, Lombok
- **Relevant Courses**: Operation System, Computer Networking, Linear Optimization, Real Analysis, Topology, Information Security, Cryptography, Combinatorics, Numerical Algebra, Algorithms & Computing Theory