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ZHIJU YANG

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TEACHING EXPERIENCE

Assistant Professor | Seattle University   Fall 2021 - Present

CPSC 5710 Security in Computing   Winter 2023
- Fundamental principles of security with emphasis on various aspects of security related to operating systems, networks, databases, and web applications.

CPSC 5330 Big Data Analytics   Spring 2023
- Introduce Hadoop/Spark architecture and the Hadoop/Spark ecosystem of tools.

CPSC 4510/5510 Computer Networks   Spring 2022, Fall 2022, Fall 2023
- Introduce topics in computer networks such as architectures (protocols, layering, interfaces, encapsulation), technologies (e.g., Ethernet, wireless), and network programming.

CPSC 1430 Programming & Problem Solving II   Fall 2021, Winter 2022, Fall 2023
- Continuation of programming and problem solving, including abstract data types (ADTs), dynamic memory, linked lists, stacks, queues, and testing.

Graduate Instructor | Colorado School of Mines

Intro to Cryptography   Summer 2019
- Served as a course instructor for a group of high school teachers of their Intro to Cryptography training.
- Introduced public-key cryptography and public-key infrastructure.
- Walked through a crypto lab that explores certificate authority, certificate creation, and digital signature.

Teaching Assistant | Colorado School of Mines

CSCI 475/598: Information Security and Privacy   Fall 2016, Fall 2018
- Graded homework, exams, and lab assignments, and held office hours to help solve students' questions.
- Set up three course lab assignments and advised students to walk through the lab assignments.

Guest Lecturer | Colorado School of Mines

CSCI 564: Advanced Computer Architecture   Spring 2017, Spring 2018
- Presented a research paper to the class that covers both computer architecture and cybersecurity topics.
- Conducted a survey to evaluate the teaching and learning effectiveness supported by NSF.

CSCI 403: Database Management   Spring 2017, Fall 2017
- Lectured SQL injection attacks and defense techniques to the class of database management.
- Covered popular defense ideas proposed in various research papers.

Course Lab Designer | Colorado School of Mines

Smartphone Side-Channel Attacks and Defenses   Fall 2017
- Developed a course lab manual that introduces how to perform a side-channel attack with motion sensor data.
- Designed five lab exercises that cover data collection, preprocessing, and machine learning model training.

Multi-Factor User Authentication   Fall 2017
- Developed a course lab manual that introduces multi-factor user authentication using the U2F protocol.
- Created a Node.js demo website that uses YubiKey devices for multi-factor user authentication.
- Designed six lab exercises to integrate multi-factor user authentication into the demo website step by step.

Teaching Assistant | Ocean University of China

Data Structure   Fall 2014, Spring 2015, Fall 2015
- Graded homework, exams, and lab assignments, and held office hours for a class of 150 students

WORK EXPERIENCE

Assistant Professor   Seattle University   Sept. 2021 - Present

    Working as an tenure-track assistant professor in the Department of Computer Science

Data Science Intern   Appen   Feb. 2020 – May 2020

    WtaGraph: Web Tracking and Advertising Detection using Graph Neural Networks (Accepted at IEEE S&P 2022)
- Proposed a GNN-based framework that effectively detects web tracking and advertising
- Achieved state-of-the-art performance in detecting web tracking and advertising traffics in the wild

Cybersecurity Intern   Accenture Research Lab   Jan. 2019 – May 2019

    Web Application Debloating and Automated Content Security Policy Implementation
- Proposed and implemented a function-level JavaScript code debloating approach.
- Crawled 1 million sites and analyzed the CSP implementation in terms of coverage and effectiveness.
- Built an Apache webserver proxy that automatically deploys CSP to requested webpages and HTTP headers.

EDUCATION

- Colorado School of Mines   Golden, CO, USA   Aug. 2016 – Dec. 2021
  Ph.D. | Computer Science , Cybersecurity

- Ocean University of China   Qingdao, China   Sept. 2013 – June 2016
  M.S. | Computer Science

- Shandong University of Science and Technology   Shandong, China   Sept. 2009 – June 2013
  B.S. | Computer Science

RESEARCH EXPERIENCE

Research Assistant   Colorado School of Mines   2016 – 2021

    Understanding Crowdsourcing Tasks: A Case Study of MTurk
- Developed a measurement tool that crawls HITs on mturk.com using Node.js, Selenium, and browser extension.
- Analyzed the characteristics of crowdsourcing tasks.

    Characterizing Security and Privacy Practices of News Websites
- Developed a crawler tool that collects data from popular news portals worldwide.
- Proposed a metric including 19 factors to quantify the security and privacy practices on a given news website.
- Characterized news websites across the world from the views of insecure inclusion and insufficient protection.

    A Measurement Study of Web Tracking on Mobile and Desktop Environments (Accepted at PETS 2020)
- Built a web tracking measurement framework that works on both mobile and desktop environments.
- Instrumented 34 JavaScript APIs to monitor web tracking related API accesses during each webpage visit
- Conducted the first in-depth comparison of web tracking between 23K mobile and desktop websites.
- Identified 762 web trackers that unique to the mobile environment

    Effective Mobile Web User Fingerprinting via Motion Sensors (Accepted at IEEE TrustCom 2018)
- Investigated the effectiveness of using motion sensor data to fingerprint mobile web users.
- Trained effective machine learning SVM model by extracting features in sensor data.
- Proposed a classifier unification mechanism that improved fingerprinting accuracy by over 25%.
- Achieved around 90% accuracy in fingerprinting user identity with motion sensor data.
- Proposed and evaluated potential defense techniques for user fingerprinting attacks

Research Assistant   Ocean University of China   2013 – 2016

    Network Troubleshooting in Software-Defined Network
- Proposed a novel network troubleshooting approach by leveraging the powerful controller of SDN.
- Filled out the reserved field of TCP packets and modified the controller to trace all packets.
- Implemented and evaluated the approach, the results verified the effectiveness.
- Was granted an M.S. degree with a thesis on this approach.

High-Performance Packet Generator
- Modified Linux kernel to fully utilize network adapter to generate and send packets in an automatic manner.
- With a Gigabit network adapter, over 950 Mb packets can be generated and sent per second.
- This generator was used to spike a huge number of packets to facilitate a following DDoS project.

Personal Project   2013 – 2016

Law Firm Case Management System
- Individually designed and developed a case management system for a law firm.

Campus Restaurant Management Services Platform
- Led, designed, and developed the first food service O2O platform on campus.

PUBLICATIONS

1. <u>Zhiju Yang</u>, Gaoyuan Man, and Songqing Yue Automated Smart Contract Vulnerability Detection using Fine-tuned Large Language Models	International Conference on Blockchain Technology and Applications, 2023
2. <u>Zhiju Yang</u>, Gaoyuan Man, and Songqing Yue. "Understanding Security Audits on Blockchain"	International Conference on Blockchain Technology and Applications, 2022
3. <u>Zhiju Yang</u> and Chuan Yue. Characterizing Security and Privacy Practices of News Websites	Under Review
4. <u>Zhiju Yang</u>, Weiping Pei, Monchu Chen, and Chuan Yue. WtaGraph: Web Tracking and Advertising Detection using Graph Neural Networks	IEEE Symposium on Security and Privacy, 2022
5. <u>Zhiju Yang</u>, Understanding and protecting user security and privacy on the web	PhD Dissertations, 2021
6. <u>Zhiju Yang</u> and Chuan Yue. A Measurement Study of Web Tracking on Mobile and Desktop Environments	Privacy Enhancing Technologies Symposium, 2020
7. <u>Zhiju Yang</u>, Rui Zhao, and Chuan Yue. Effective Mobile Web User Fingerprinting via Motion Sensors.	IEEE Conference on Trust, Security, and Privacy in Computing and Communications, 2018
8. <u>Zhiju Yang</u>, Research on Networking Troubleshooting Method Based on Software Defined Network	Master Thesis, Ocean University of China, 2016

RESEARCH GRANTS

Seattle University Summer Faculty Fellowship, *$7,000*	2023
NSF Computer and Information Science and Engineering Research Initiation Initiative (CRII), *submitted*	2023

ACADEMIC REVIEWER SERVICES

Dependable Systems and Networks (DSN)	2020
ACM Conference on Data and Application Security and Privacy (CODASPY)	2019
The International Journal of Computer and Telecommunications Networking	2018

LANGUAGES AND TECHNOLOGIES

Mobile / Front-end:	JavaScript, Browser Extension, HTML, Android, CSS, Bootstrap
Back-end:	Python, Node.JS, Rust, Machine Learning, C/C++, Java, Web Server, Git, SQL, MongoDB

AWARDS

First Place, Tyler Technologies Virtual Coding Competition   Nov. 2020
- Developed a decision-based AI using JavaScript that plays the board game against other teams' AIs.
- Won the grand finale and scholarship by beating all other teams from our and other universities.

First Place, Tyler Technologies Programming Contest   Jan. 2017
- Solved the most algorithm problems in 4 hours.

First Place, CS@Mines JavaScript Hackathon   Nov. 2016
- Designed and built an Airplane Shooting Game using a new JavaScript game engine and is voted as the best game.