RUXIN (DAISY) WANG

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EDUCATION

Louisiana State University, Baton Rouge, LA, USA *Aug. 2020 - Present*
PhD. in Computer Science (CS)

Syracuse University, Syracuse, NY, USA *Aug. 2017 – May. 2019*
M.S. in Computer Engineering (CE)

Northeast Forestry University, Harbin, China *Aug. 2013 – May. 2017*
B.S. in Electronics Engineering (EE)

WORK EXPERIENCE

HSBC Bank (China) Company Limited, Guangzhou, China *Aug. 2019 - Jul. 2020*
Software Engineer

RESEARCH INTERESTS

Cyber Security and Privacy, Mobile Sensing and Computing, Machine Learning, Deep Learning.

HONORS AND AWARDS

Travel Grant at the 44th IEEE Symposium on Security and Privacy (S&P23) *04/2023*

N2Women Fellowship, Student Research Competition Semifinalists, Travel Grant at the 27th Annual International Conference On Mobile Computing And Networking (MobiCom21) *04/2022*

Third Place Award at LSU's Graduate Research Conference *03/2022*

Symposium Meritorious Awards at LSU's 4th EECS Graduate Student Research *03/2022*

Student Graduated with Honors at Northeast Forestry University *05/2017*

PUBLICATIONS

Louisiana State University, Baton Rouge, LA, USA

- **R. Wang**, L. Huang, and C. Wang, "Low-effort VR Headset User Authentication Using Head-reverberated Sounds with Replay Resistance." in *Proceedings of the 44th IEEE Symposium on Security and Privacy (IEEE S&P)*, 2023.
- GV. Gonzalez, C. Wang, **R. Wang** and TT. Tseng, "Extended reality and binge eating behaviors among minorities." in *Proceeding of the 16th Health Disparities Conference (XULA)*, 2023
- **R. Wang**, K. Madden, C. Wang, "Low-effort User Authentication for Kiosk Systems based on Smartphone User's Gripping Hand Geometry." *Late Breaking Work of the 2022 CHI Conference on Human Factors in Computing Systems*, 2022.
- **R. Wang**, L. Huang, and C. Wang, "Preventing handheld phone distraction for drivers by sensing the gripping hand," in *Proceedings of the 18th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (IEEE MASS)*, 2021.

- **R. Wang**, L. Huang, and C. Wang, "Poster: Distracted Driving Detection By Sensing The Hand Gripping Of The Phone," in *Proceedings of The 27th Annual International Conference On Mobile Computing And Networking (ACM MobiCom)*, 2021.

Northeast Forestry University, Harbin, China

- **R. Wang**, "Tentative Analysis of Electric Automatization Integrated Application on Electrical Engineering" in *Scientific Chinese*, Sep., 2016.
- **R. Wang**, "Research on Artificial Intelligence Application on Electrical Engineering and Automation" in *Science and Technology Innovation Herald*, Sep., 2016.

RESEARCH PROJECTS

AR-enabled Dietary Health Monitoring and Intervention *11/2022 - Present*

Description: we propose an unobtrusive and practical system to automatically monitor the user's dietary habits on AR glasses.

- Our system monitors users' dietary habits in real-life scenarios by analyzing the dietary information, such as chewing and swallowing rates, to detect unhealthy patterns like binge eating.
- We develop an AR application that captures dietary details through the multiple sensors of AR glasses' and utilizes learning-based algorithms to analyze the data for dietary episode detection, as well as for identifying chewing and swallowing.

Leveraging Novel Gripping Hand Biometrics to Authenticate Users *08/2022 – Present*

Description: we propose a two-factor authentication system that integrates the traditional security tokens and the novel gripping hand biometric for Kiosks.

- We find that the geometry of each individual's hand when gripping a phone is unique. Moreover, this information can be easily acquired when the user holds a phone at a kiosk to make a payment or to check in or out.
- We develop a CNN-based algorithm to extract and distinguish people's gripping hand biometric features for authentication. Hand image processing schemes are developed to extract the gripping hand geometry features while normalizing and de-noising the hand image.

VR Headset User Authentication Using Skull-reverberated Sounds *08/2021 – Present*

Description: we propose an efficient and low-effort authentication system for current VR headsets leveraging head-reverberated sounds.

- Our system allows the already shipped VR headsets to identify a user through millisecond-level acoustic signals without kernel or hardware modifications.
- We develop a CAE-CNN algorithm to encode the head biometric for each individual from acoustic signals, counteract the built-in echo cancellation effect, reduce noise impacts to serve long-term use, and increase difficulties for replay attacks.

Preventing Handheld Phone Distraction for Drivers *08/2020 – Present*

Description: we propose a continuous phone-use monitoring system to eliminate the driver's handheld device distraction.

- Our system leverages active acoustic sensing to detect when the phone is held by the driver's hand and take safety-enhancing measures immediately.
- We design error correction mechanisms to process the phone-use sampling results and facilitate capturing each complete handheld phone-use instance and its detailed timing information accurately in noisy in-vehicle environments.

WORK PROJECT

Maintaining and Enhancing Financial Transaction Platform, HSBC *08/2019 – 07/2020*
Description: Software Developing and Testing.

- Developed a tool in JAVA that automatically scans a stream of zip files and picks out the useful ones at five-second intervals. The tool significantly improves efficiency, as these tasks were traditionally performed manually.
- Maintained and enhanced the internal financial transaction platform in SQL. The upgraded system now offers businesses the ability to instantly generate customizable reports and export them in multiple formats, including PDF, Excel, and Word.
- Conducted comprehensive functional testing to validate end-to-end user workflows. Authored detailed test plans and cases and documented bug reports to provide a transparent and reproducible testing process.

SELECTED OTHER PROJECTS

Travel Experiences Management Website, LSU *08/2022 – 11/2022*
Description: To provide an easy way to store and manage users' travel experiences (e.g., files, photos).

- Designed a 3-tier web application architecture using Amazon Web Services (AWS). The first tier consisted of static content created with HTML5, CSS, and JavaScript, which was stored on an Amazon EC2 instance running an Apache web server. The second tier featured seven Java servlets deployed on another EC2 instance that ran a Tomcat server. The third tier housed a MySQL database deployed on a separate EC2 instance.
- The Apache server handled user requests and routed them to Tomcat, which connected to MySQL via Java Database Connectivity (JDBC).

Reinforcement Learning in Car Racing Games for Self-Driving, LSU *08/2021 – 05/2021*
Description: To develop a race car AI using reinforcement learning algorithms.

- Developed a car racing game in Unity, designed Performance, Environment, Actuators, Sensors (PEAS) problem specifications, and created a bridge to facilitate communication between reinforcement learning models in Python and the game environment in C#.
- Implemented four types of reinforcement learning algorithms such as Proximal Policy Optimization (PPO), NeuroEvolution of Augmenting Topologies (NEAT), Deep Deterministic Policy Gradient (DDPG), and Deep Q-Learning Network (DQN).

Remote Code Repository in C++, Syracuse University *01/2018– 05/2018*
Description: To develop a remote code repository responsible for managing source code resources (e.g. files and documents) and access the repository's functionality over a communication channel.

- Developed client-side using GUI and WPF framework enables the client to upload and download files and developed server-side using WCF framework to provide functionality like check-in, check-out, and browse files.
- Designed and implemented a NoSQL database that could support CRUD operations by using the unordered map in C++. Implemented an HTTP-style message protocol and socket-based asynchronous message-passing communication channel.

TECHNICAL STRENGTHS

Programming Language: Python, JAVA, C++, C#, MATLAB, SQL.
Deep Learning Framework: Tensorflow, Keras, Pytorch.
Website Development: Amazon Web Services, Spring Boot, AngularJS, WCF/WPF, CSS, HTML.