Long Huang

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EDUCATION

- **Ph.D. Candidate in Computer Science** August 2019 - Present
  Division of Computer Science and Engineering, Louisiana State University, Baton Rouge, LA
  Advisor: Dr. Chen Wang
- **M.E. in Electrical Engineering** August 2017 - May 2019
  Stevens Institute of Technology, Hoboken, NJ
- **B.E. in Electrical Engineering** August 2011 - July 2015
  University of Electronic Science & Technology of China, Chengdu, China

RESEARCH INTERESTS

Mobile Computing, Mobile Sensing, Mobile Security, Internet of Things

HONORS AND AWARDS

- **Best Paper Award** in the IEEE International Workshop on Wireless Sensor, Robot and UAV Networks (IEEE WISARN), 2021.
- **Student Travel Grant** in the 27th Annual International Conference on Mobile Computing and Networking.
- **Student Travel Grant** in the 43rd IEEE Symposium on Security and Privacy.
- **Gary Marsden Travel Award** in 2022 ACM International Conference on Pervasive and Ubiquitous Computing.

RESEARCH EXPERIENCE

Mobile and Internet SecuriTy Lab (MIST LAB), Louisiana State University 08/2019 - Present

- **Challenge-response Biometric Authentication for Handheld Device**
  - Proposed a novel acoustically extracted hand-grip biometric, which is associated with every user's hand geometry, body-fat ratio, and gripping strength; It is implicit and available whenever the user grips a handheld device.
  - Integrated a coding technique in the biometric acquisition process, which encodes static biometrics into dynamic biometric features to prevent data reuse. This low-cost method can be deployed on any handheld device that has a speaker and a microphone.
- **Gripping Hand Verification Using Media Sounds**
  - Showed that media sounds, such as the melodies of notification tones (e.g., iPhone message and Samsung whistle) can be directly used to sense and verify the user's gripping hand.
  - Developed a cross-domain method to validate hard-to-forge physical relationships among the mic, speaker, and accelerometer to prevent external sounds from cheating the system.
- **User Verification for Motion-controlled Robotic Arm Systems**

- Built up a motion-controlled robotic arm framework comprising a robotic arm end and a user end, which are connected via a network and responsible for manipulator control and motion capture respectively.
- Proposed to verify who is controlling the robotic arm by examining the robotic arm's behavior, which adds a second security layer in addition to the system login credentials.

- **Pedestrian Identification Using Footstep Sounds**
  - Developed an unobtrusive pedestrian identification system by passively listening to people's walking sounds. The proposed acoustic system can be easily integrated with the widely deployed voice assistant devices while providing the context awareness ability.

Stevens Institute of Technology **05/2018 – 05/2019**

- **StevensCAD**
  - Improved the algorithm for intersection detection and wrote the algorithm for merging multiple shapes, which are part of a new CAD software developed to have faster computation speed.
- **Homework Collection & Grading System**
  - Developed a homework collection & grading system with UI to be used by the instructors, which runs the submitted code automatically and gives out a base grade. Multiple algorithms have been deployed for plagiarism detection.

PUBLICATIONS

Journal Articles:

[1] **Long Huang**, and Chen Wang. "Unobtrusive Pedestrian Identification by Leveraging Footstep Sounds with Replay Resistance." *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* 5.4 (2021): 1-19.

[2] **Long Huang**, Zhen Meng, Zeyu Deng, Chen Wang, Liying li, and Guodong Zhao. "Towards Verifying the User of Motion-controlled Robotic Arm Systems via the Robot Behavior." *IEEE Internet of Things Journal* (2021).

Conference Papers:

[3] **Long Huang**, and Chen Wang. "PCR-Auth: Solving Authentication Puzzle Challenges with Encoded Palm Contact Responses." *2022 IEEE Symposium on Security and Privacy (SP)*. IEEE, 2022.

[4] **Long Huang**, and Chen Wang. "Notification privacy protection via unobtrusive gripping hand verification using media sounds." *Proceedings of the 27th Annual International Conference on Mobile Computing and Networking*. 2021.

[5] Ruxin Wang, **Long Huang**, and Chen Wang. "Preventing Handheld Phone Distraction for Drivers by Sensing the Gripping Hand." *2021 IEEE 18th International Conference on Mobile Ad Hoc and Smart Systems (MASS)*. IEEE, 2021.

Workshop Papers and Posters:

[6] **Long Huang**, Zhen Meng, Zeyu Deng, Chen Wang, Liying li, and Guodong Zhao. "Robot Behavior-Based User Authentication for Motion-Controlled Robotic Systems." *IEEE INFOCOM 2021-IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)*. IEEE, 2021.

[7] **Long Huang**, Zhen Meng, Zeyu Deng, Chen Wang, Liying li, and Guodong Zhao. "Extracting human behavioral biometrics from robot motions." *Proceedings of the 27th Annual International Conference on Mobile Computing and Networking*. 2021.

[8] Ruxin Wang, **Long Huang**, and Chen Wang. "Distracted driving detection by sensing the hand gripping of the phone." *Proceedings of the 27th Annual International Conference on Mobile Computing and Networking*. 2021.

[9] Chen Wang, Jingjing Mu, and **Long Huang**. "Protecting Smartphone Screen Notification Privacy by Verifying the Gripping Hand." *Proceedings of the 2020 ACM Workshop on Information Hiding and Multimedia Security*. 2020.

[10] **Long Huang**, and Chen Wang. "WalkID: Towards Context Awareness of Smart Home by Identifying Walking Sounds." *2020 IEEE 6th World Forum on Internet of Things (WF-IoT)*. IEEE, 2020.

SERVICES

Reviewer for Journals/Conferences:

- PACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)
- ACM CHI Conference on Human Factors in Computing Systems