Website:zhangshaohu.github.io
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SHAOHU ZHANG

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EDUCATION

North Carolina State University **Raleigh, NC** **8/2017–5/2022**
Ph.D. candidate in **Computer Science** |Adviser: Prof. Anupam Das

Teaching assistant: CSC453/591/791 Internet of Things, CSC433/533 Privacy in the Digital Age

South Dakota State University **Brookings, SD** **8/2013–5/2017**
Graduate student in Computer Science (transferring to NCSU) |Adviser: Prof. Myounggyu Won
M.S. Civil Engineering (Transportation Engineering) |Adviser: Prof. Jonathan Wood
Selected coursework: CSC705 Algorithms, CSC710 Programming Languages, CSC720 Theory of Computation, CSC770 Software Engineering, CSC574 Computer Networks, GEOG786 Adav. GIS (Python), STAT574 Statistical Methods (SAS)

Zhejiang Ocean University **Zhoushan, China** **9/2006–6/2010**
B.A. Marine Fishery Science and Technology

SKILLS AND INTERESTS

- Experience in ArcGIS, Mobile App Development, Microcontroller programming, Machine Learning, and Deep Learning.
- Proficient in C++ and Python, familiar with Java, SAS, Matlab and R.
- ML frameworks: Scikit-learn, Pytorch, Tensorflow/Keras.
- ML experience: Data analytics, Visualization, Supervised/unsupervised modeling.
- Interests: machine learning, sensor sensing, IoT, privacy and security.

EMPLOYMENT

- **Research Assistant, Wolfpack Security and Privacy Research (WSPR) Lab, NCSU** **12/2019–present**
- **Research Assistant, Wolfpack Interactive, Sensing and Networking Lab (WiSN) Lab, NCSU** **8/2017–12/2019**
- **Research Assistant, Wireless Embedded and Networked Systems (WENS) Lab, SDSU** **8/2015–12/2016**
- **Research Assistant, Civil Lab for Operations and Safety Engineering in Transportation, SDSU** **5/2014–5/2015**

SELECTED PROJECTS

- **HeadTalk:** Currently study and investigate a speaker head orientation based privacy control system, *HeadTalk*, which leverages the indicator of the speaker orientation (i.e., forward and backward) to mitigate the VA misactivation when the users speak wake word or similar phonics. Our pilot experiment shows that the speaker orientation might be a feasible privacy control approach for current home voice assistant. *HeadTalk* is non-intrusive and no extra hardware needed compared with the state of the art schemes.
- **HandLock:** Proposed and developed the concept of using a gesture-based authentication system for smart home voice assistants called *HandLock*, which uses built-in microphones and speakers to generate and sense inaudible acoustic signals to detect the presence of a known hand gesture. *HandLock* can act as a second-factor authentication for performing sensitive activities such as making online purchases through voice assistants. Through extensive experiments involving 45 participants, we show that *HandLock* can achieve on average 96.51% true-positive-rate at the expense of 0.82% false-acceptance-rate **(Linux, Python, Matlab, and RF)**.
- **Naturalistic Driving Data project:** main investigator to evaluate relationships between perception-reaction times, emergency deceleration rates, and crash outcomes by mining the Naturalistic Driving Data **(Logistic regression, Causal inference)**.

SELECTED AWARDS

- **COE Enhancement Fee Travel Award:** North Carolina State University, 2020.
- **NSF Student Travel Grant:** SenSys'16 and MobiCom'17.
- **Sigma Xi Graduate Research Award:** South Dakota State University, 2016.
- **Best Undergraduate Thesis Award:** Zhejiang Ocean University, China, 2010.

SELECTED PUBLICATIONS

- **Shaohu Zhang**, Anupam Das, *HandLock: Enabling 2-FA for Smart Home Voice Assistants*, **MobiSys'21** (Under Review).
- **Shaohu Zhang**, Raghav Venkatnarayan, Muhammad Shahzad, *A WiFi-based Home Security System*, **IEEE MASS**'20
- Jonathan Wood, **Shaohu Zhang**, *Evaluating Relationships Between Perception-Reaction Times, Emergency Deceleration Rates, and Crash Outcomes using Naturalistic Driving Data*, **Transportation Research Record**, 2020.
- Muhammad Shahzad, **Shaohu Zhang**, *Augmenting User Identification with WiFi Based Gesture Recognition*, **Ubicomp**'18