



SECURITY WITHOUT BURDEN: MOBILE SENSOR BASED IDENTITY MANAGEMENT

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ABSTRACT: Sensitive information is frequently stored or accessed from mobile devices because of the popularity of those devices and their wide applications. However, the essential task of mobile user authentication is rendered more challenging by the conflicting requirements of security and usability: usable solutions are often insecure, while secure solutions hinder device accessibility. Though often posed as difficult security and design problems, the challenge also brings new opportunities for mobile device vendors, application developers, and academic researchers.

In this talk, I will present the research results and designs on mobile identity management by leveraging the physical sensors available on today's smartphones. These include touch panel, microphone, and motion sensors. Touch based identity management and access control offer many advantages toward addressing the trade-off between security and usability on mobile platforms. Instead of periodically logging out the user, following an explicit user authentication step, a touch based authentication approach can verify the user's identity transparently through monitoring the user's touches. In addition, I will discuss emerging technologies invented in our lab that integrates biometric sensors such as fingerprint sensors directly with a touchscreen panel. The new technique transparently and continuously authenticates the mobile user during normal user-mobile device interactions and requires neither password nor extra login step. At last, I will present how our solution can be extended to address some of the grand challenges in cyber security using touch enabled biometrics.

BIOGRAPHY: Dr. Shi received his Ph.D. of Computer Science from Georgia Institute of Technology. Mr. Shi was previously a senior research staff member at Motorola Research Lab, Nokia Research Center at Palo Alto, and co-founder of a technology startup focusing on value-added cloud services and infrastructure. Currently, Mr. Shi is a faculty member of the Computer Science Department at University of Houston. In the past, Mr. Shi contributed to the ASIC design of multiple NVIDIA platform products and was credited to published EA console game. In addition, Mr. Shi authored and co-authored over 50 peer-reviewed publications covering research topics in computer architecture, cloud computing, system security, multimedia services, and mobile computing. His current research efforts include identity management, big data infrastructure, hardware support for security and privacy, impact of emerging technologies to computer architecture and sensing systems. Mr. Shi was the inventor and co-inventor of multiple issued and pending USPTO patents. Mr. Shi is a senior member of IEEE. Currently, his research team is funded by National Science Foundation and Department of Homeland Security.