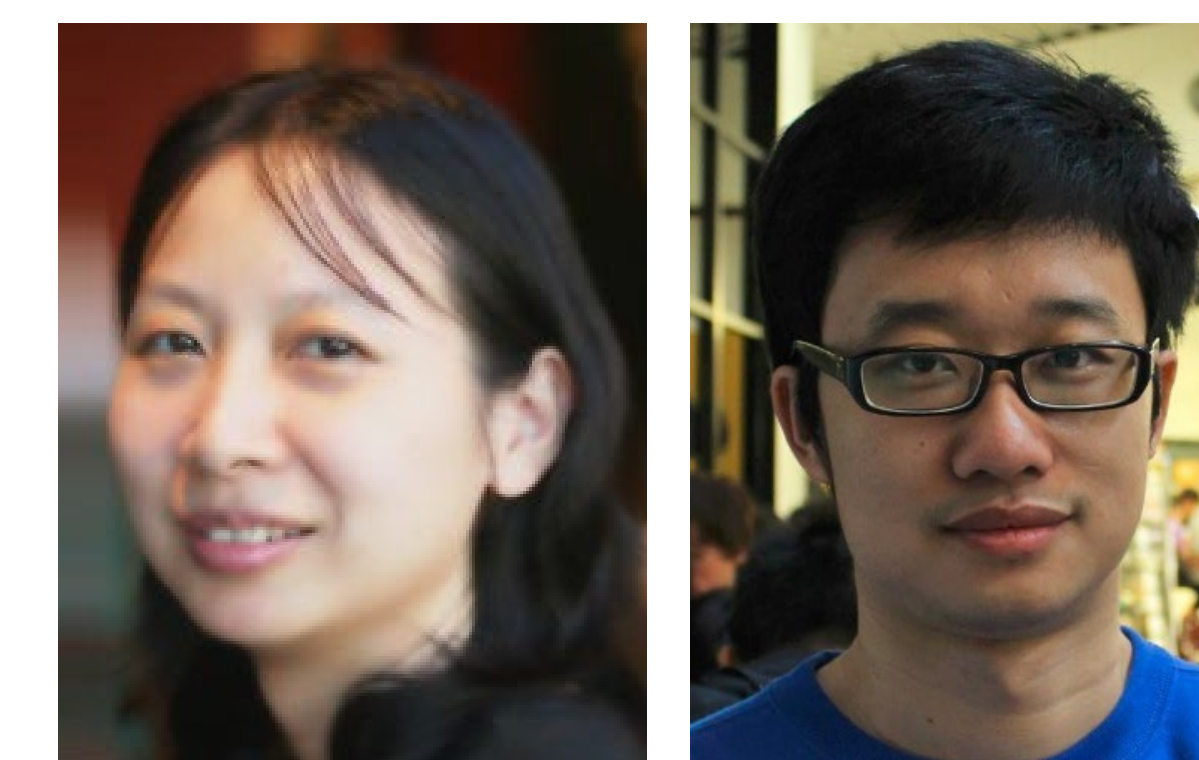


Exploiting Physical Properties in Wireless Networks for Implicit Authentication

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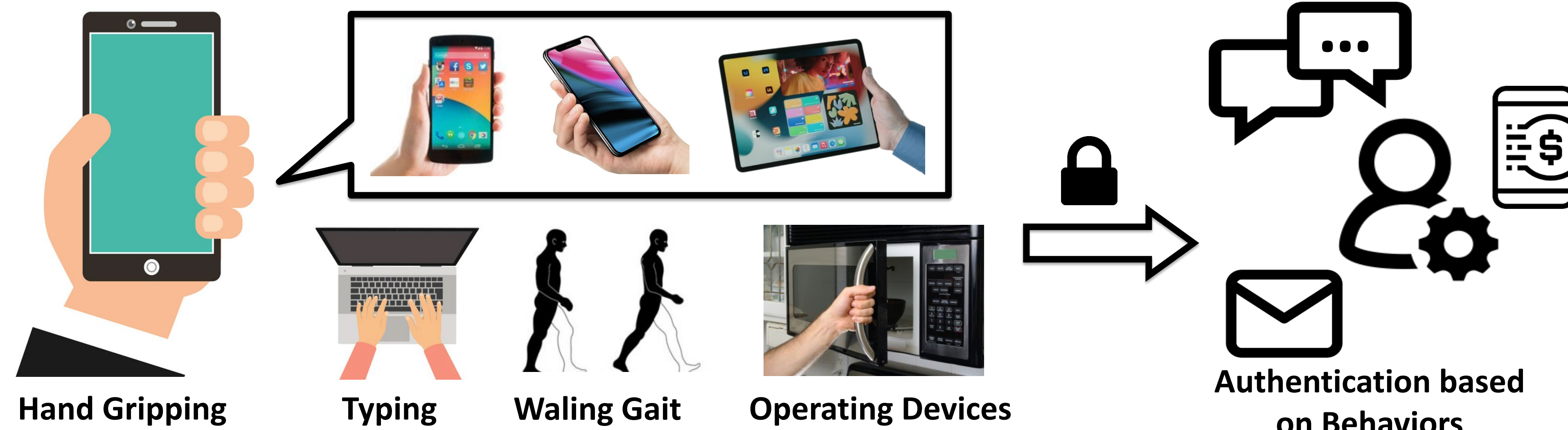
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Behavior-based Implicit User Authentication

- Provide enhanced security to mobile and IoT users via behavior-based implicit authentication
- Enable customized services corresponding to a specific user (e.g., adjusting room temperatures/lighting conditions)
- Sense behavioral biometrics with readily available acoustic and WiFi signals on mobile and IoT devices for continuous and low-effort user authentication



Challenges

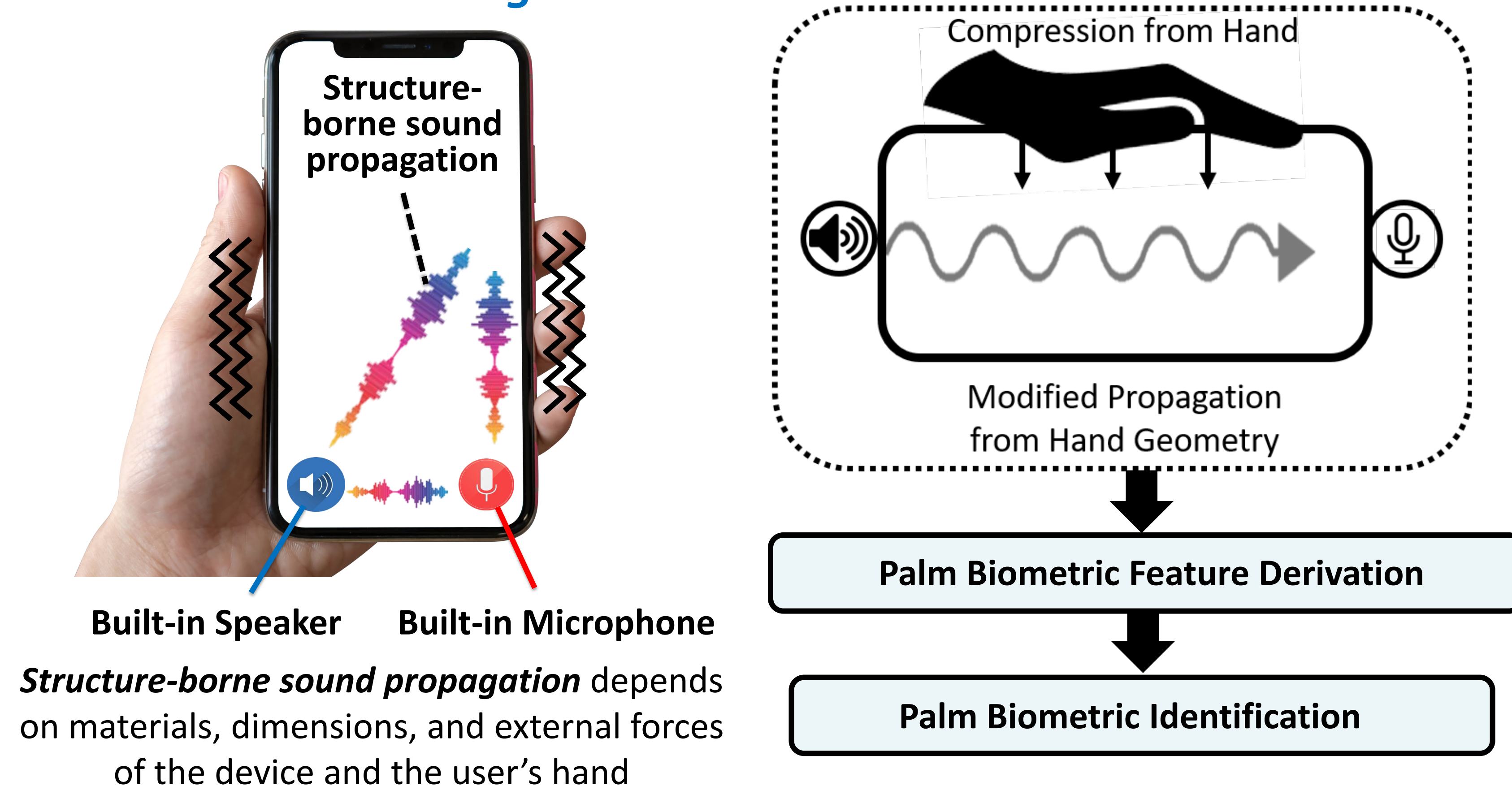
- Quantify the differences in user's behavioral biometrics captured by acoustic and WiFi signals
- Extract representative features from acoustic and WiFi channel state information measurements for user authentication
- The changes of the position and environment to perform activities can distort the signals' patterns, resulting in false predictions

Scientific Impacts

- Advance knowledge in exploring behavior-based authentication via readily available sensors/devices
- Contribute to the successful development and adoptions of customized applications involving mobile and IoT devices
- Implement and validate the proposed strategies by prototyping the framework with commodity hardware

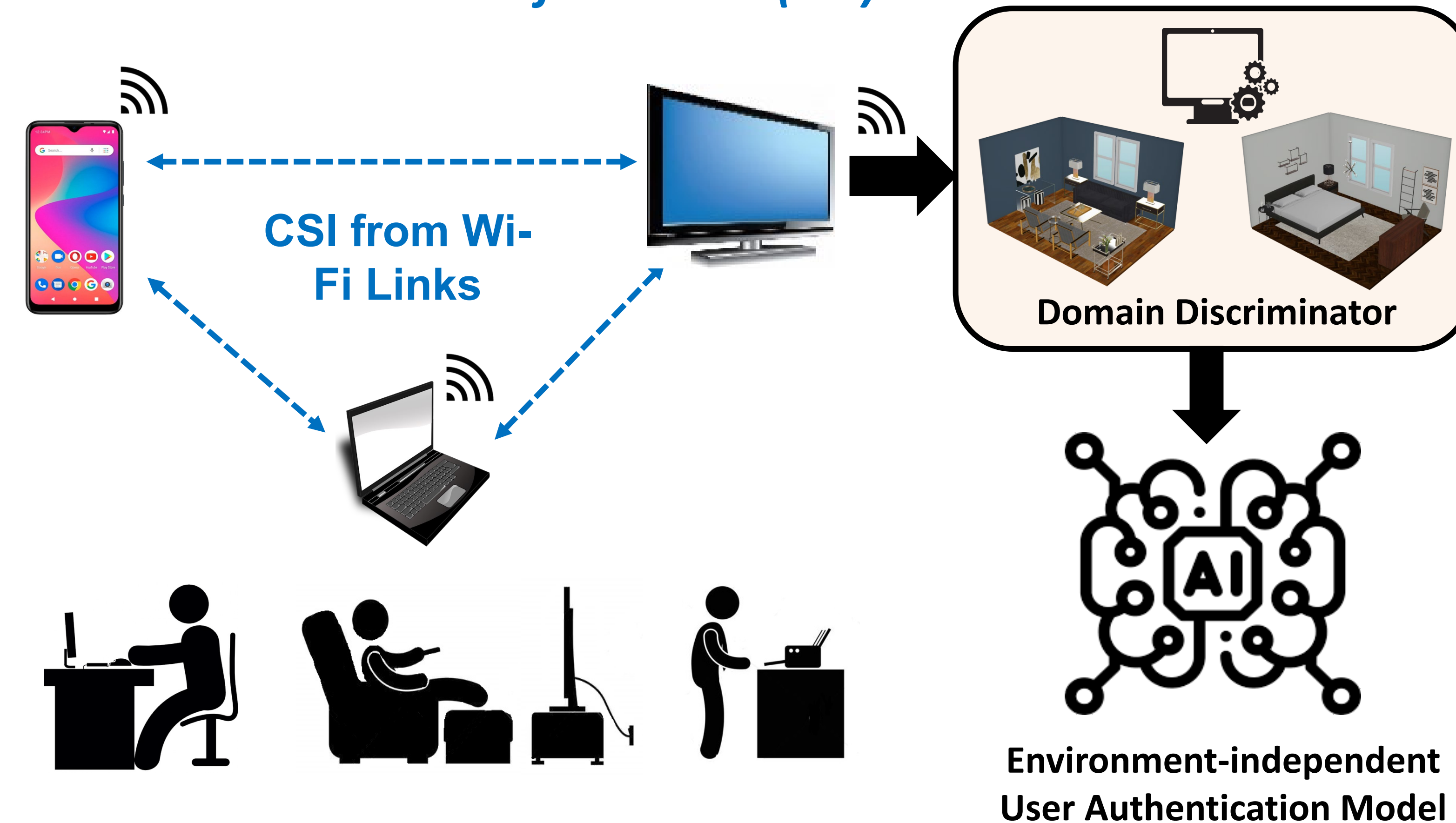
Approaches

Hand Gripping- and Palm-biometric-based Authentication via Acoustic Sensing



- Capturing palm biometric information embedded in structure-borne sound using commodity microphones and speakers

Environment-independent Authentication Using WiFi Channel State Information (CSI)



- Leverage deep learning and domain adaptation techniques to derive environment-independent features for user authentication

Broader Impacts

- Advance the foundation of exploiting acoustic and WiFi sensing for security solutions
- Include curriculum development, outreach to K-12 students
- Facilitate a variety of emerging mobile and IoT applications

