



Multi-Sensory Event Detection for Cross-Platform Coordination and Verification

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Motivation and Challenge:

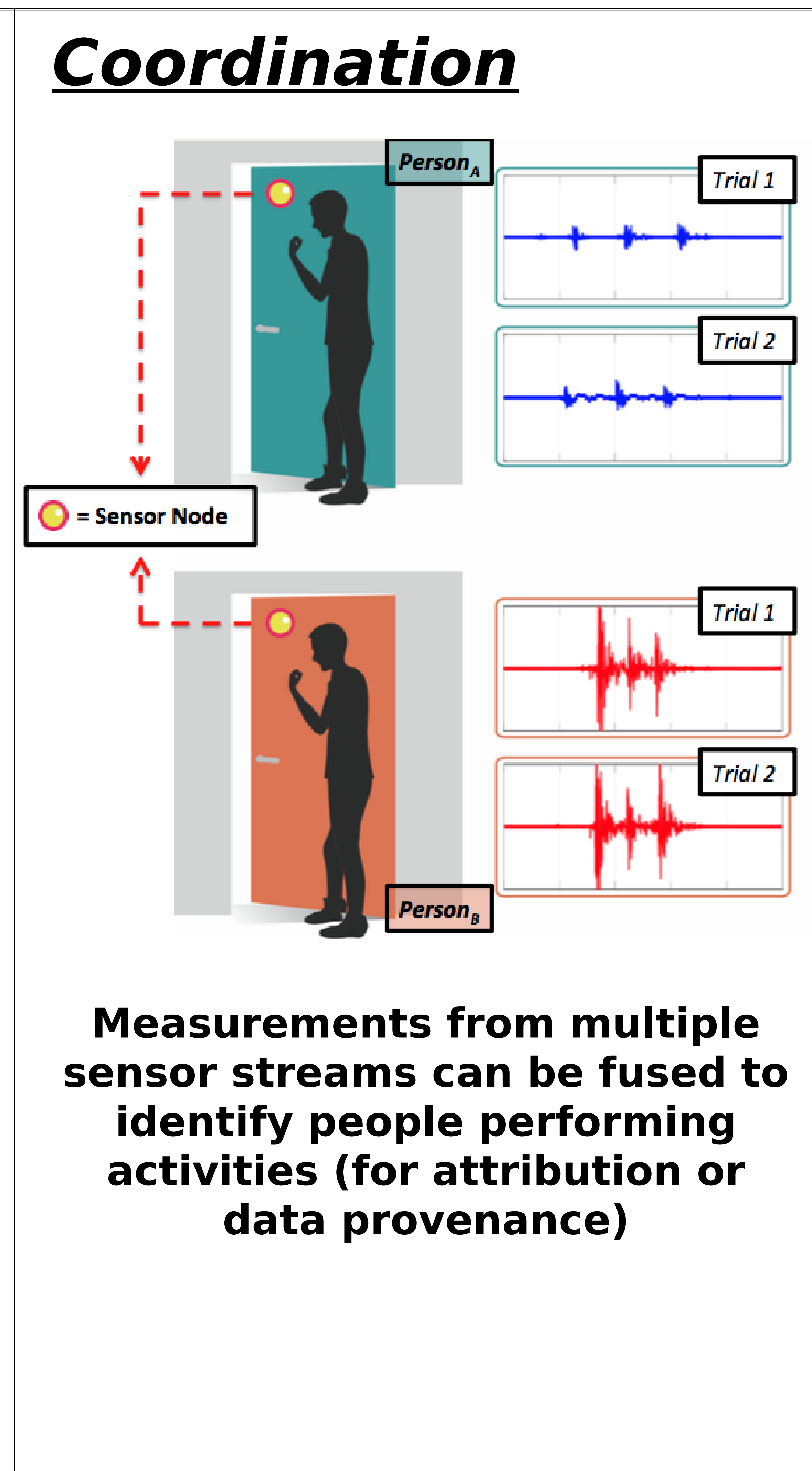
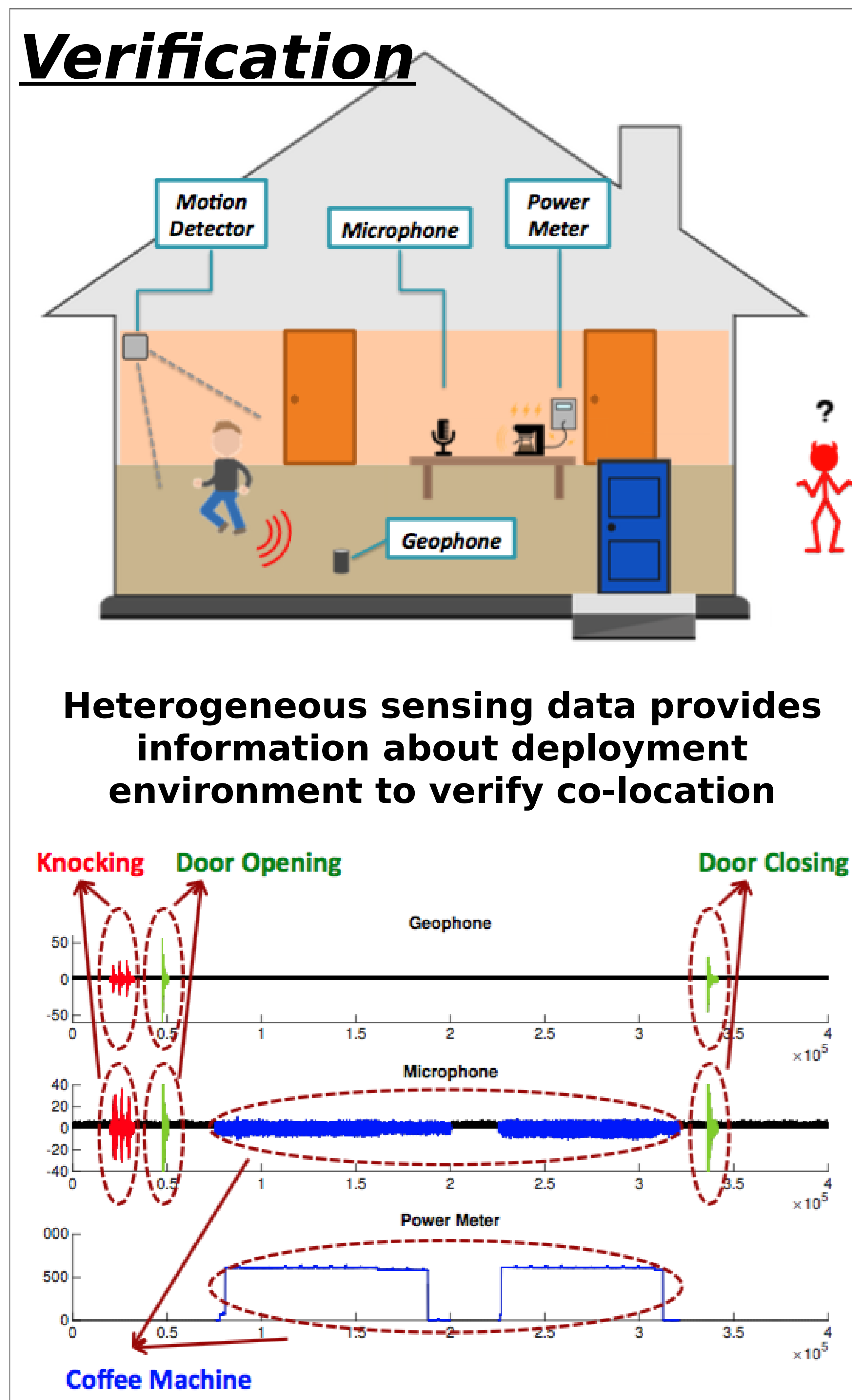
- Sensor data *validation* across devices enables verification of physical properties and context
- *Coordination* across trusted devices further enables security applications

Context Verification:

- Secure pairing across differing sensor types
- Exploit time as invariant property across different sensor types to verify their co-location

Signal Coordination:

- User identification, authentication, attribution
- High accuracy attained via sensor fusion across multiple trusted devices



Scientific Impact:

- Our data analysis and fingerprinting techniques can be applied in several CPS domains
- To date, designed for smart home and cooperative driving scenarios

Broader Impact:

- Providing essential capabilities for validation in data-driven services
- Contributing to improved usability of smart devices / environments
- Contributing to open-source educational materials

Resulting Publications:

- [1] SenseTribute: Smart Home Occupant Identification via Fusion Across On-Object Sensing Devices, ACM BuildSys'17
- [2] PitchIn: Eavesdropping via Intelligible Speech Reconstruction using Non-Acoustic Sensor Fusion, ACM/IEEE IPSN'17
- [3] Convoxy: Physical Context Verification for Vehicle Platoon Admission, ACM HotMobile'17