

# Event recognition for meaningful human-computer interaction in a smart environment

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# Aims of the project

- Localization and recognition of spatio-temporal events
- Intention sensing, authentication and analysis of interactions of individuals through multiple sensors
- Implementation of a small-scale, hierarchical biometrics system
- Visualization of people and interactions

# Aware home projects

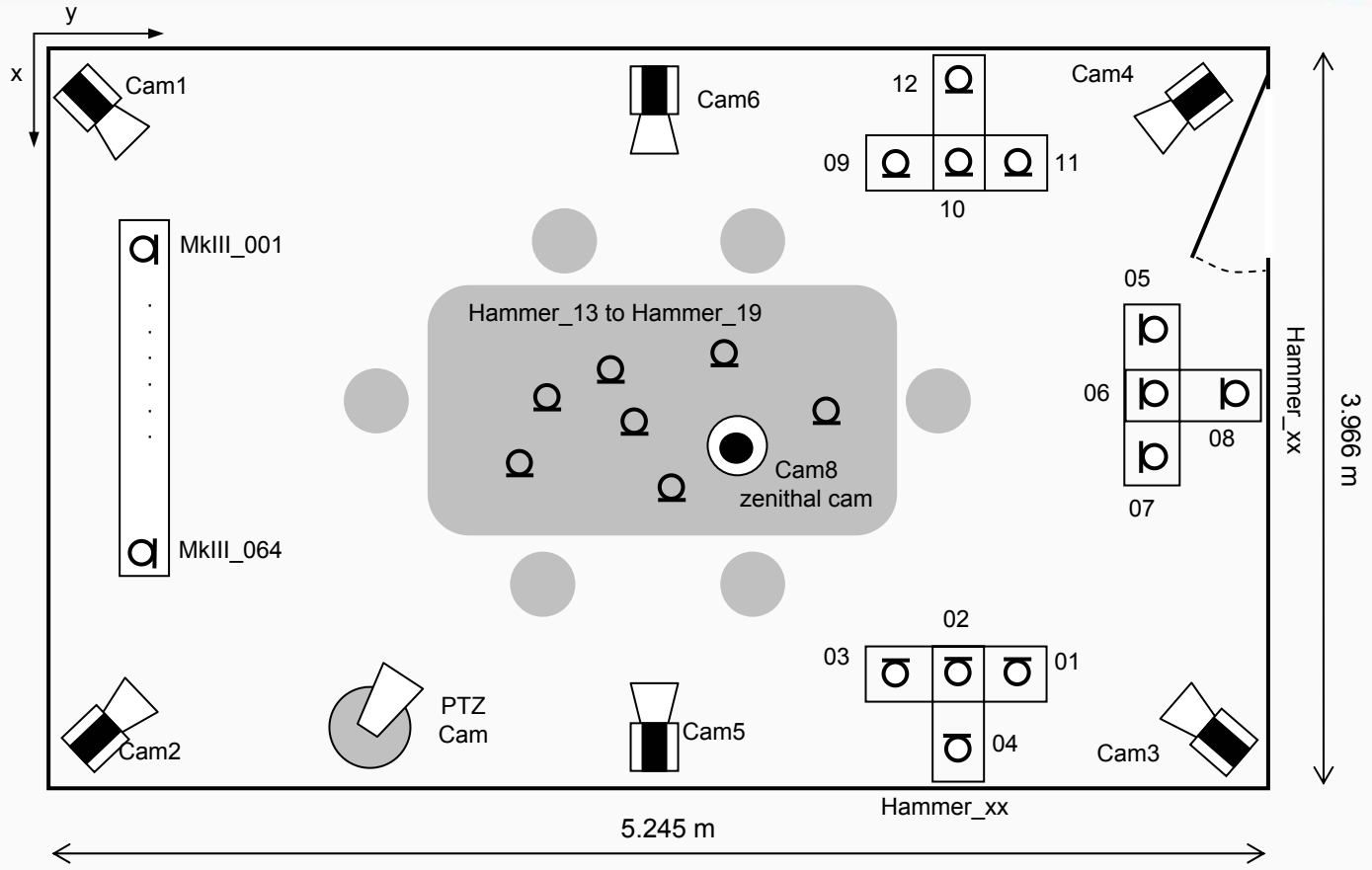


- Adaptive House (University of Colorado)
- Kids Room (MIT)
- Command Post (Carnegie Mellon University)
- Aware Home (Georgia Tech)
- Easy Living (Microsoft)
- PRIMA (Inria)
- Philips HomeLab

# Some related technologies

- Motion detection (visual)
- Person identification (visual, acoustic)
- Tracking (visual, acoustic)
- Speech detection (acoustic)
- Head pose estimation (visual, acoustic)
- Gesture recognition (visual)
- Gait analysis (probably not used...)

# UPC Smart Room Description





# Smart room description



# Components I

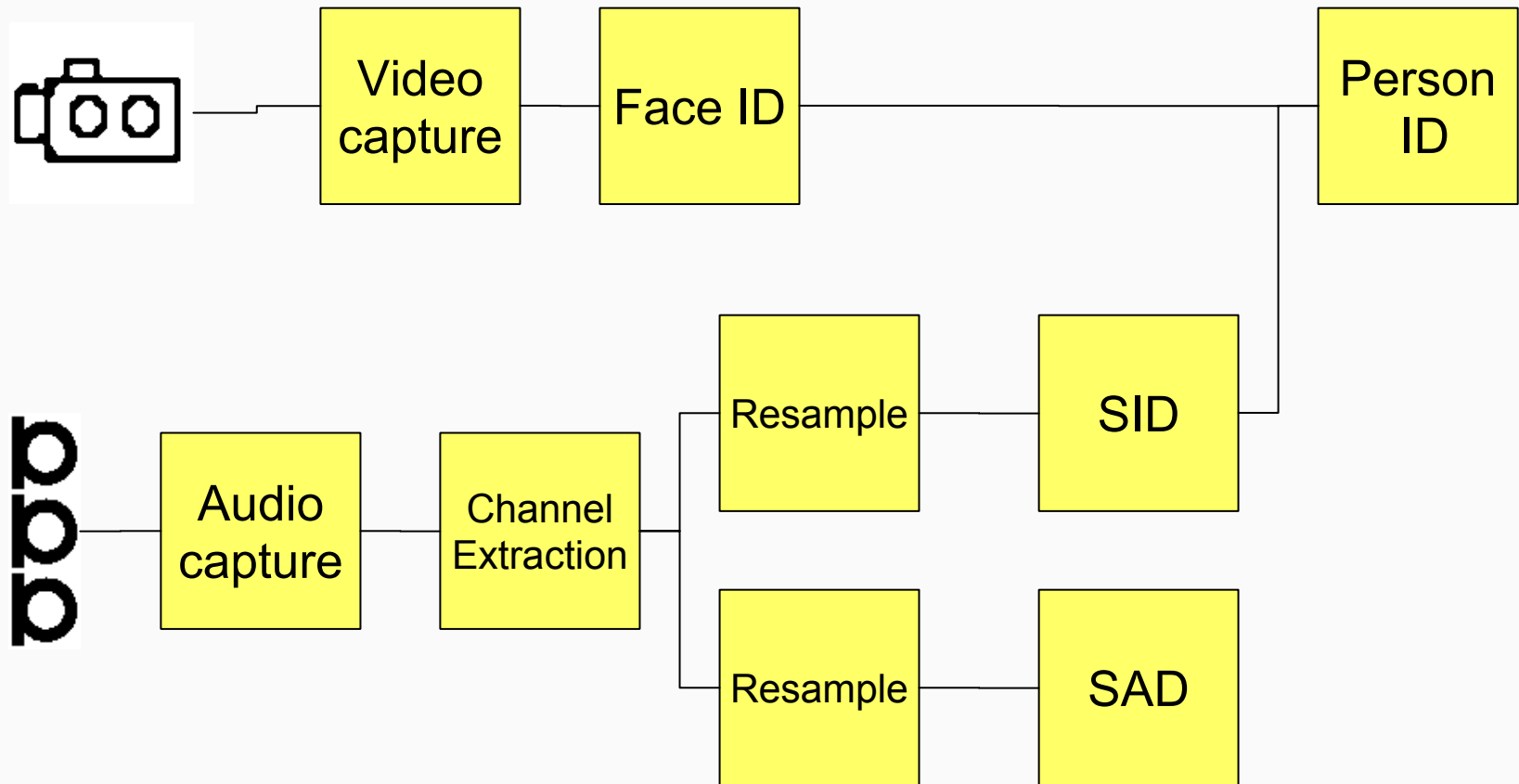
- Motion detection
- Face detection
- Face recognition
- Visual feature-based tracking
- Acoustic tracking
- Speaker segmentation & identification
- Head pose orientation detection

# Components II

- Gesture analysis (STARS)
- Multimodal fusion, knowledge propagation
- Middleware: NIST Smartflow
- Other modalities?
  - RFID
  - PIR (interruption)
  - Pressure
  - Temperature
  - Humidity



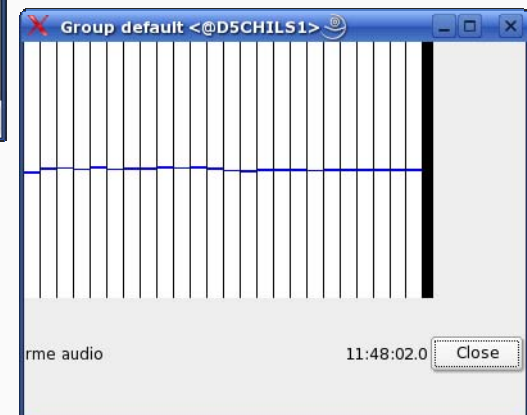
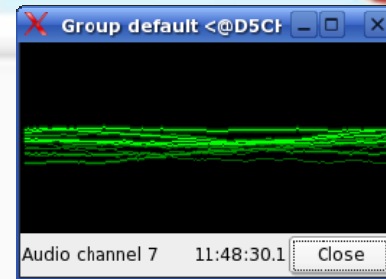
# Smartflow architecture



# Smartflow architecture

Type of flows:

- Audio
- Video
- Data



# Outcomes

- Visualization of persons and activities
- Small-scale biometrics system
- Monitoring the environment



# Ideas for extensions

- Lego Mindstorms robot
- Arduino board for additional sensors
- PDA-based extensions
- Any contributions from other eNTERFACE workgroups more than welcome!!



# Questions?