No Purpose – No Data: Goal-Oriented Access Control for Ambient Assisted Living

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Glance

- Ambient Assisted Living (AAL)
- Demo
- Goal-oriented Role Based Access Control
- Summary
Ambient Assisted Living (AAL)

- AAL is a home environment enhanced with embedded technologies
  - Cameras
  - Oximeter
  - Smart T-shirt
  - ...
Concrete scenario

- We do not want our medical data out unless it serves some purposes: **privacy requirement**
- We want to be monitored even if one of monitor devices fails: **dependability requirement**
Smart-Home prototype
Video demo
Organizational Model

- Organizational Model
  - Goals, Actors

   - Handle emergency
   - Detect emergency
     - Collect sensor data
     - Detect emergency from sensor data
     - Response to emergency

   - Smart Home
    - Sensor Manager
    - Camera Handler
Organizational Model

- Organizational Model
  - Goals, Actors, Goals-to-Actors assignment

- Handle emergency
  - Detect emergency
    - Collect sensor data
    - Detect emergency from sensor data
  - Response to emergency

Goal Oriented RBAC
• Organizational Model
  – Goals, Actors, Goals-to-Actors assignment

- Handle emergency
- Response to emergency
- Smart Home

- Detect emergency
- Sensor Manager

- Collect sensor data
- Oximeter Handler
- Camera Handler

- Detect emergency from sensor data
Goal-Oriented Role-Based Access Control

• Organizational model
  – Privacy goals
    • E.g., MERC wants to check out medical data for monitoring purpose
  – Critical goals
    • E.g., Access monitor devices’ data in an emergency
  – Normal goals

• Access control strategies
  – Privacy setting
    • Privacy resources are accessed by authorized agents if and only if it is needed
  – Dependability setting
    • The derived permissions of all sub goals’ resources are released once the user is authorized to fulfill the top goal
  – Normal setting
GoRBAC Architecture
Summary

- AAL security challenges
  - Privacy requirement
  - Dependability requirement

- GoRBAC for AAL applications
  - Privacy strategy
  - Dependability strategy
  - Normal strategy

- Smart-Home prototype

http://www.disi.unitn.it/~massacci/Download/SERENITY-MPEG.mpg
Thank you

QUESTIONS?