Université catholique de Louvain

ÉCOLE POLYTECHNIQUE DE LOUVAIN

LINGI2252

Software Maintenance and Evolution

Home Automation System – Lab 1

Authors:
Gustin Simon
1171-14-00
Hallet Adrien
3276-13-00

Professor:
Mens Kim
Assistant:
Duhoux Benoît

October 10, 2018

1 Lexicon

Sensor Physical device that measures the magnitude of real-life variables.

Light sensor Sensor that measures the quantity of light in a room (lights being off or on).

Consumption sensor Sensor that detects and records the consumption of different resources (power, water, etc).

Clock Sensor that measures the time flying by (and can be used to set alarms at certain times).

Actuator Physical device that is able to take actions in the physical world (make noise, light, move, etc).

Heavy appliance Home systems that use lots of electricity (washing machine, dishwasher, oven, etc).

IoT Internet of Things, the use of the internet for appliances like watches, clothes, ...

Hub Physical and/or digital system to centralize a group of systems.

2 Example Scenario - Leaving baby home alone

It is time to fetch the kids at school and nobody else is available to bring them back. Your baby is in his bed and you have no choice but to leave him for a moment. You know it is a bad idea but hopefully you can rely on your *Home Automation System*.

You leave home and setup the system via your smartphone. Your *smart door* locks itself up and redirects its *intercom* feed to your smartphone since your door has a *video sensor*. Because you also opted for a *motion sensor* in the entrance, the *anti-burglar* turns on and is ready to set the *alarm* off, just in case. On your smartphone, the *audio sensor* in the baby's room calibrates itself to pick any irregularity up and acts as a *babyphone*. The temperature in the baby's room will be kept constant thanks to the automatic heating system, so the baby is not too hot or too cold.

3   Feature Model

Legend:
- ● Mandatory
- ○ Optional
- △ Alternative
- ▢ Abstract
- ▣ Concrete

Sensors
- Spatial
  - Motion
  - Proximity
  - Badge Detector
- Audio
- Video
  - Camera
  - Infrared Camera
- Consumption
- Temperature
- Gas
  - Smoke
  - Carbon Monoxide
- Clock
- Humidity

Constraints
- Alarm ⇒ Alarms
- Babyphone ⇒ Audio
- Consumption ⇒ Clock
- Feeding ⇒ Proximity
- "Heating system" ⇒ Temperature
- "Consumption Control" ⇒ Consumption
- "Police Call" ⇒ "Phone Management"
- "Automatic Gardening" ⇒ Clock
- "Automatic Cleaning" ⇒ Clock
- "Firefrighter Call" ⇒ "Phone Management"
- Locks ∨ Auto-Opening ⇒ "Badge Detector"
- "Automatic management" ⇒ "Consumption Control"
- Intercom ⇒ Camera ∨ "Infrared Camera"
- "Air Quality" ⇒ Humidity ∨ "Carbon Monoxide"
- "Position Tracking" ⇒ Motion ∨ Proximity

HomeAutomation

Features
- Safety
  - Security
    - Smart Doors
      - Locks
      - Auto-Opening
      - Intercom
        - Audio-Only
        - Video-Audio
    - Anti-Burglar
      - Alarm
      - Notification
      - Police Call
  - Fire
    - Smoke Detection
    - Fire Sprinklers
    - Firefrighter Call
- Ambiance
  - Heating system
  - Air Quality
    - Information Display
    - Phone Notification
- Everyday Tasks
  - Smart Kitchen
    - Cooking Appliance
    - Fridge Stocks
      - Product Ordering
  - Automatic Cleaning
    - Vacuums
    - Pool Cleaner
  - Automatic Gardening
    - Sprinklers
    - Lawnmower
  - Heavy Appliance Control
    - Remote Control
    - Automatic management
  - Baby and Pet care
    - Position Tracking
    - Feeding
    - Babyphone
  - Sound management
    - Alarms
    - Radios
    - Home Cinema
  - Electronics Management
    - Small Electronics
    - Internet of Things
    - Phone Management
      - Answering Machine
- Consumption Control
  - Water
  - Power