Context-aware Systems Testing and Validation

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**Appendix A**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Enablers** | **Assumptions**  **Initial values** | **Context Feature 1** | **Context Feature 2** | **…** | **Context Feature z** |
| **Context Description** |  |  |  |  |  |  |
| **Expected Outcome (s)** |  |  |  |  |  |  |
| **Sensors** | S1 |  |  |  |  |  |
| … |  |  |  |  |  |
| Ss |  |  |  |  |  |
| **Network** | N1 |  |  |  |  |  |
| … |  |  |  |  |  |
| Nn |  |  |  |  |  |
| **Database** | D1 |  |  |  |  |  |
| … |  |  |  |  |  |
| Dd |  |  |  |  |  |
| **Reasoners** | R1 |  |  |  |  |  |
| … |  |  |  |  |  |
| Rr |  |  |  |  |  |
| **Learners** | L1 |  |  |  |  |  |
| … |  |  |  |  |  |
| Ll |  |  |  |  |  |
| **HCI** | H1 |  |  |  |  |  |
| … |  |  |  |  |  |
| Hh |  |  |  |  |  |
| **Preferences** | P1 |  |  |  |  |  |
| … |  |  |  |  |  |
| Pp |  |  |  |  |  |
| **Users** | U1 |  |  |  |  |  |
| … |  |  |  |  |  |
| Uu |  |  |  |  |  |

**Appendix B**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Enablers** | **Assumptions**  **Initial values** | **Context Feature 1** | **Context Feature 2** | **Context Feature 3** | **Context Feature 4** | **Context Feature 5** |
| **Context Description** |  |  | **The user going to bed, but he/she is still moving around the house.** | **Checking if there is movement around the house when user is on bed** | **The user needs to lay on the bed which has the pressure pad sensor indicating the change of state** | **No movement detected in the house, and the pressure pad is not idle** | **The light should be off as long the user is as sleep.** |
| **Expected Outcome (s)** |  |  | **The movement sensor stays active, keeping the lights ‘on’, since the user is yet to be on bed and moving around the house.** | **Movement sensors should trigger off if no movement is detected in the room or other areas in the house.** | **Pressure pad triggers off indicating it is not idle.** | **The light should trigger off when there is no movement in the room and the user is on bed.** | **The light stays off at this point regardless if movement is detected or not.** |
| **Sensors** | PIR Sensor |  | √ | √ | √ | √ | √ |
| Pressure Pad |  |  |  | √ | √ | √ |
| Light Actuator |  |  |  |  |  | √ |
| **Database** | Preferences database | Comfort = 8  Light = 4 |  |  |  |  |  |
| **Reasoners** | Real -time Context  reasoner | User is not sleeping | Check variations on PIR as an indicator of movement | All PIR sensors indicate absence of movement for a reasonable time | Bed pressure pad indicates someone is in bed | Lights go off | If same conditions for PIR and pressure pad then lights stay off |
| **HCI** | Preference interface |  |  |  |  |  |  |
| **Preferences** | P1 | Prefers comfort over Light |  |  |  |  |  |
| **Users** | Only user |  |  |  |  |  |  |

**Appendix C**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Enablers** | **Assumptions**  **Initial values** | **Context Feature 1** | **Context Feature 2** |
| **Context Description** |  |  | **Notifying user when the temperature may provoke an asthma attack** | **Notifying user when the PM10 level may provoke an asthma attack** |
| **Expected Outcome (s)** |  |  | **Delivering a mobile notification when indoor/nearby outdoor temperature is below the control limit** | **Delivering a mobile notification when the nearby outdoor PM10 level is above the control limit** |
| **Sensors** | Google Awareness Temperature (Logical sensor) | User set up 10 C as the lower control limit for temperature | T < 10 C |  |
| Indoor temperature sensor | User set up 10 C as the lower control limit for temperature | T < 10 C |  |
| London Air PM10 level (Logical sensor) | User set up the upper control limit for PM10 |  | PM10 > 50 ug m-3 |
| **Network** | Zwave |  | Permanent connection | Permanent connection |
| **Database** | Preferences database | User set up the control limit for T | Provides the control limit for temperature | Provides the control limit for PM10 |
| Monitoring database |  | Stores the context being monitored | Stores the context being monitored |
| **Reasoners** | Context-Aware Reasoner |  | Assesses the indoor/outdoor temperature | Assesses the outdoor PM10 level |
| **HCI** | Mobile application GUI |  | Shows the notification alerting patient | Shows the notification alerting patient |
| **Preferences** | Mobile application |  | Allows user to personalise their control limits for temperature | Allows user to personalise their control limits for PM10 |
| **Users** | Person with asthma (PwA) |  | Confirming their health status through the mobile GUI | Confirming their health status through the mobile GUI |

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