

Report on the week of the sustainable development

This document presents the work done during the week of the sustainable development held at the HEPIA during the second week of September 2016.

The workshop was organised by Mandat International and presents the principles of the Internet of Things (IoT) to the HEPIA students. The main topic is the energy efficiency inside the HEPIA building and how to reduce the energy consumption in this building. The students have proposed some new ideas to improve the energy efficiency of the building. The students' propositions have been written using the IoT Lab mobile application and consisted of scenarios with the sensors and the actuators installed in the room A534. Afterwards, the best ideas were implemented using the IoT Lab Testbed as a Service (TBaaS).

The sensors and actuators have been deployed in the frame of the Smart HEPIA project. There are two wireless sensors able to measure the temperature, the humidity, the luminance and the motion. The actuators are three relays controlling the lighting, six radiator valves and six blind controllers. A Modbus energy meter is used to retrieve the current electricity consumption inside the classroom. All these IoT devices were integrated onto the IoT Lab platform by the Mandat International team.



Illustration 1: Z-Wave wireless sensor



Illustration 2: Z-Wave relay for the lighting



Illustration 3: KNX radiator valve



Illustration 4: KNX blinds controller



Illustration 5: Modbus energy meter

The students have implemented several scenarios by creating different experiments. After each experiment, the results were exported from the TBaaS under the form of an Excel file or a CSV file. The last step was to analyse the results using for example Excel. Some graphics were generated and displayed below.

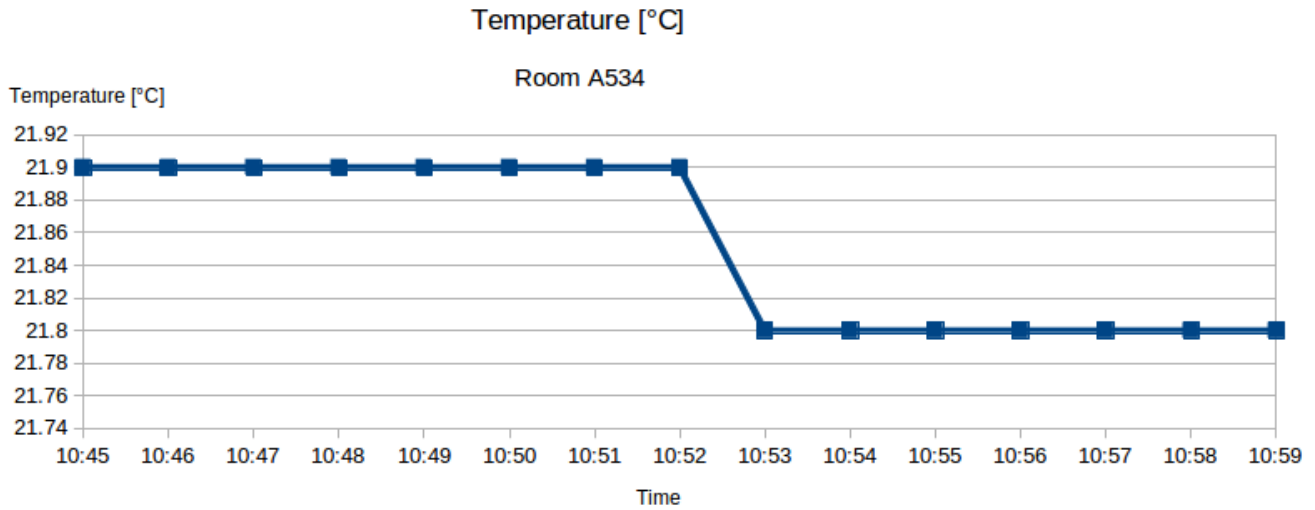


Illustration 6: Temperature in the A534 classroom

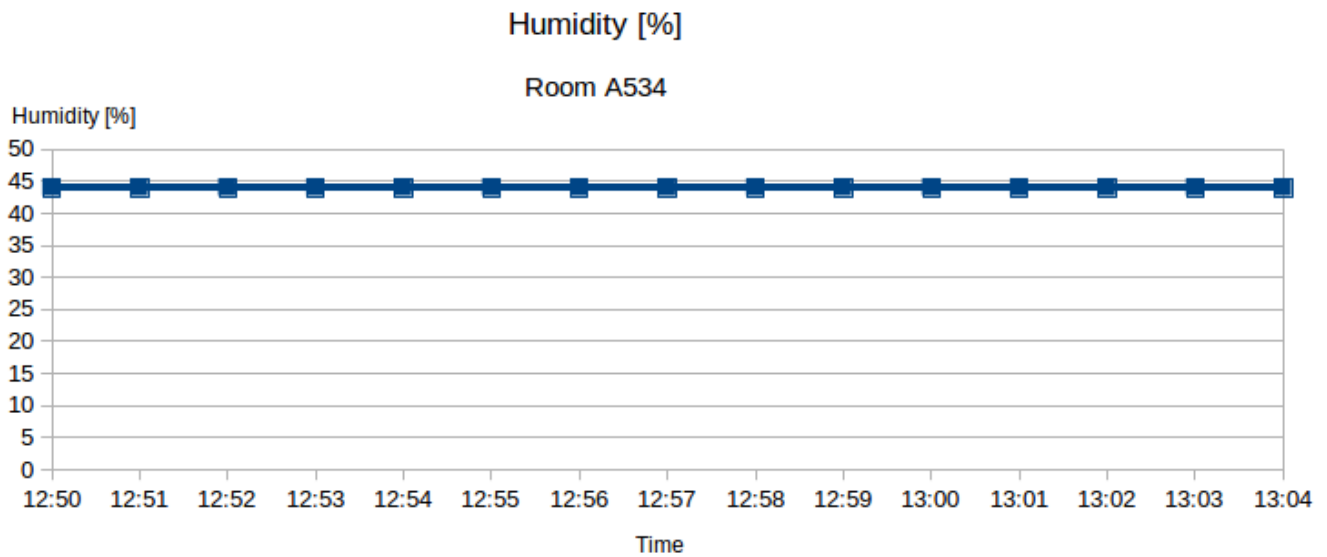


Illustration 7: Humidity in the A534 classroom

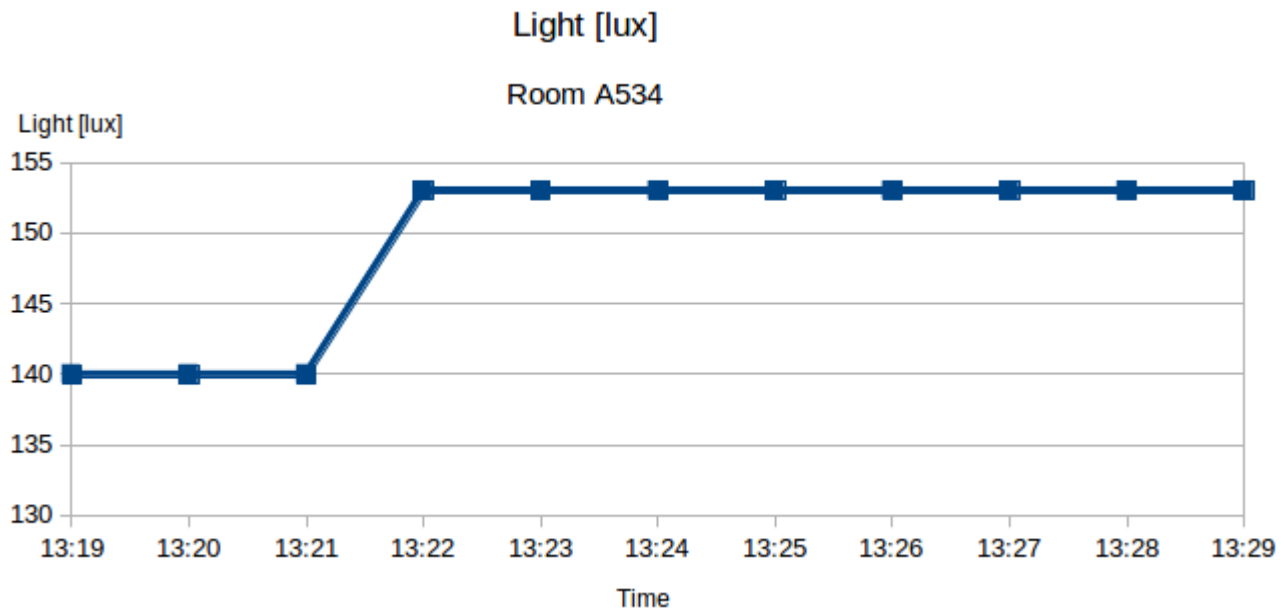


Illustration 8: Light in the A534 classroom

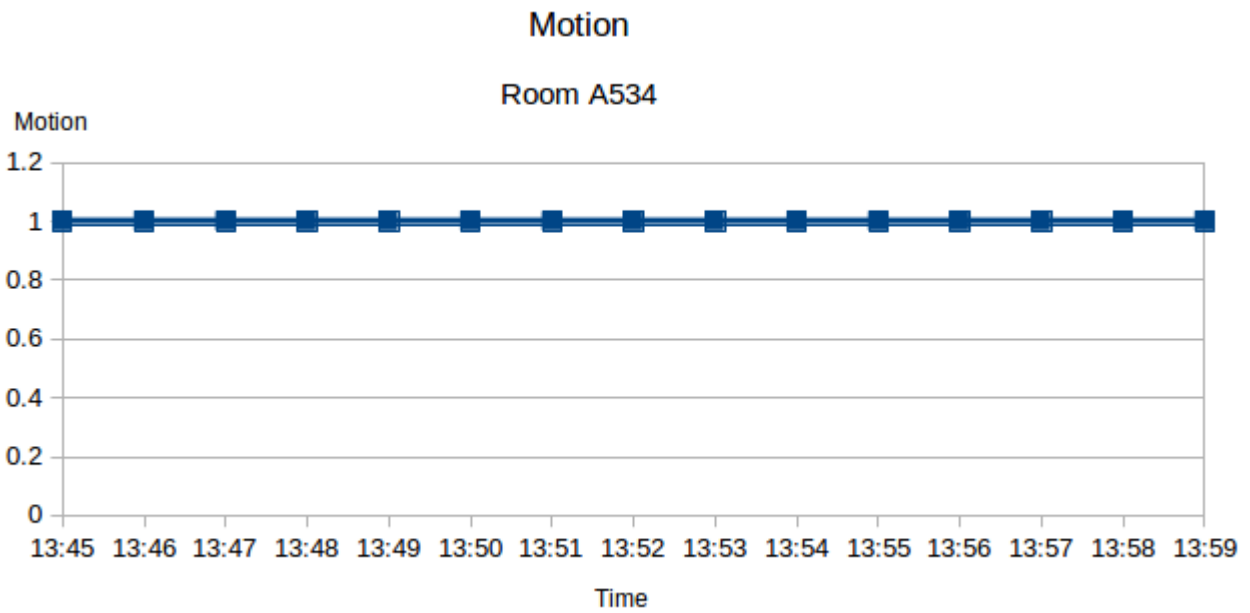


Illustration 9: Motion in the A534 classroom

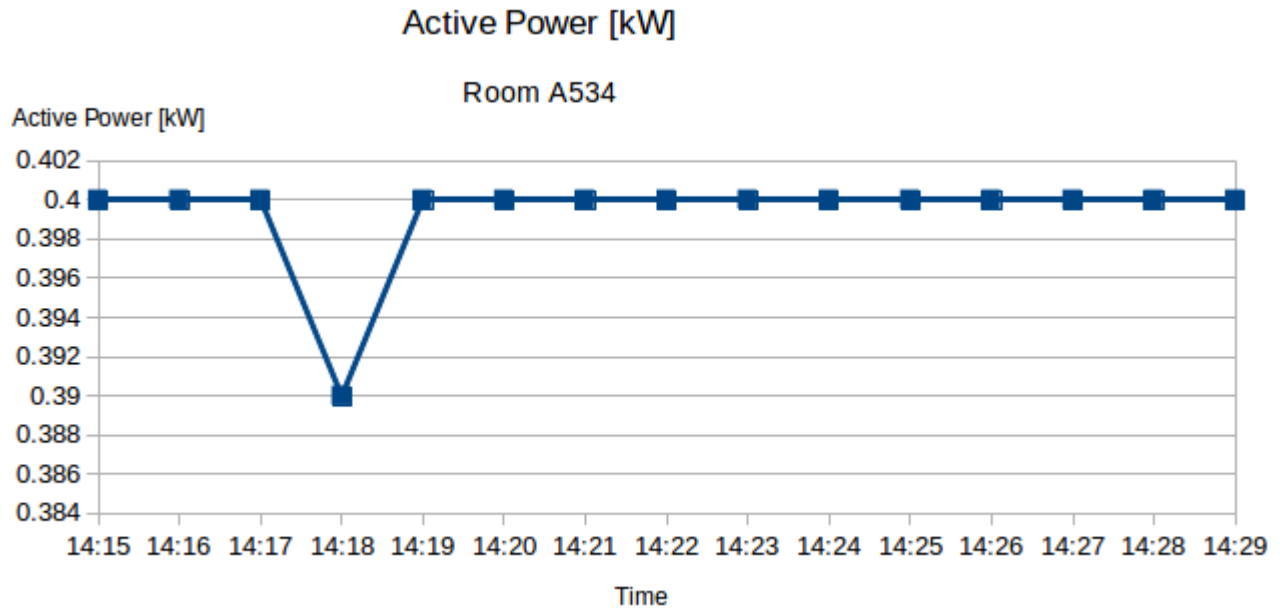


Illustration 10: Active power in the A534 classroom

Finally, the students had to create a video about the topic of the workshop (in our case, the energy efficiency in the HEPIA building) and the activities realised through the IoT Lab platform during all the week. Here a link to a students' video on Youtube:

<https://www.youtube.com/watch?v=6ZBgY09cJ9g>