Campus DT Potential Use Cases

Document to keep track of potential Use Cases of Campus DT

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From Juliette van Duijnhoven

What might be interesting research questions that could be explored with that DT of Atlas are:

- What are the lighting control settings being mostly used by building occupants?
- Can we see trends based on occupancy data or other environmental parameters (temp, air quality, acoustics) that correlate with lighting settings?
- Actual energy use of electric lighting in ATLAS and whether we see actual changes in energy use after possible interventions (e.g., energy savings campaigns or ‘the other end’ healthy lighting campaigns).

From Ekaterina Petrova

She is currently supervising a Master graduation project where the candidate is doing prediction of environmental data and visualizing it on 3d spaces. The student would like to know what are and what will be the conditions in a particular study room. Because there is no data available from ATLAS, the student worked with a building from Tu/Delft. The next problem was that the data of that building was impossible to match or work with. Finally, the student, along other researchers in the group, decided to use a building from Berkley University as her data source. That building has actual useful data. They find it a pity that they have to use a building from so far away.

This researcher could also incorporate this new DT in courses. Some of her students are doing anomaly detection of the same Berkley building. Anomalies such as defect HVAC equipment are typical use cases. They focus specifically on ventilation of buildings.

Usually, people do this work on historical data sets, as they don’t have access to real-time data sets. They never get access to actuator control. But, if we would have control, they could test MPC on HVAC or environmental actuators. Because this was not available in ATLAS, they did MPC on eVeh charging in Breda. (This would be mostly for research purposes.)

Another interesting topic could be to optimize evacuation actions.