



Finansē
Eiropas Savienība
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Project title: Nr. 1.3 Development of sensor solutions and forecasting models for optimal building power efficiency management

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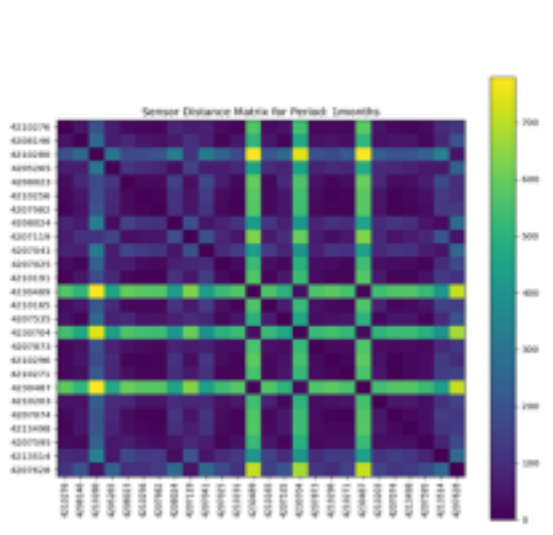
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Project completed during the period 01.10.2023. - 31.12.2023.:

According to the previously created work plan, at this stage, additional metrics were used to evaluate the similarity of sensor readings. Dynamic Time Warping (from the English Dynamic Time Warping) is specifically used.

In time series analysis, dynamic time warping (DTW) is an algorithm for measuring the similarity between two-time series that may have different rates. For example, the similarity of a person's gait can be determined using DTW, even if one person walks faster than the other or if there were accelerations and decelerations during the observation. DTW has been used for time series of video, audio, and graphics data—indeed, any data that can be converted to a one-dimensional time series can be analyzed with DTW. It is used, for example, in natural language analysis, as well as in the analysis and comparison of other time-varying processes.

During this period, comparisons of sensor data have been made using the DTW metric to compare specific sensors, as well as comparing the result with the comparison obtained in the previous period. The comparison was made by standing data strings of different lengths for 1 day and 1 month. In addition, a comparison of data from different floor sensors was made (the darker the color, the more similar the time series).



You can see in the picture that the readings of some sensors are very different (light color), while others are very similar, which would potentially allow them to be replaced. To assess the impact of substitution on situational awareness, several prediction models including LSTM, TCN, GRU and a mixed LSTM-GRU model have been developed. Research continues, focusing directly on the implementation of the sensor placement method.

Project team.

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