Abstract

The European Union estimates that buildings are responsible for more than 40% of final energy consumption. Lowering the energy demand of buildings means improving the underlying building management systems (BMS) to reach maximum efficiency. In general, building automation relies on clear data provided by various systems connected to the BMS.

Many buildings use individual meta data schemes, that manage how sensor and control units are labeled. Due to the lack of a uniform meta data scheme, extracting information from a label is often ambiguous and requires on top of that expert knowledge, making the whole process difficult and time consuming. In order to overcome the problem, different uniform meta data schema have been developed, on of them is the BUDO schema. This scheme was specifically designed to be machine readable and display all necessary information in the label. However, transferring data point labels by hand into the BUDO scheme is demanding and slow. For that reason, Aikido was implemented to use artificial intelligence to categorize existing labels into the BUDO schema. Aikido is a browser based tool, that allows user to upload BMS data points and categorize them into the BUDO schema with the help of artificial intelligence .

The goal of this thesis is to expand and optimize an alternative Aikido algorithm in order to categorize data points into the BUDO schema. In particular, the alternative algorithm uses a LSTM-Convolutional model. The focus of this thesis is to improve the Aikido algorithm and evaluate different techniques and changes to in crease overall performance and reduce the labeling effort. Especially, different techniques of data processing as well as changes to the model structure and parameters are evaluated. Lastly, the impact of high quality training datasets is evaluated, by analyzing the data coverage as well as the resulting F1-Scores.

In this process the Aikido algorithm has been improved and deeper insights were collected for the Aikido algorithm and future applications utilizing a convolutional layer.