SUBMISSION NOTE

Some preliminary results of this article appeared in IEEE International Symposium on Circuits and Systems (ISCAS 2016) [Zhao et al. 2016]. In this journal submission, we have made significant changes over the conference version. We believe the difference is more than 40% over the conference version of this work. The details of changes are summarized below:

(1) First, we added another learning-based technique, support vector regression (SVR) for thermal-sensor-based occupancy detection in smart buildings. This addition itself can account about 30% changes to the original conference submission.

(2) Detail concepts of EnergyPlus and machine-learning based methods for occupancy detection have been added in Sections 2 and 3 so that the main content and the contribution of the new work can be better appreciated. Also, the details of feature selection and data configuration used in the two machine learning methods for occupancy detection have been added in Section 4.

(3) Experiment results of SVR based occupancy detection have been given in Section 5. We added the discussion and comparison between the SVR and RNN methods in the experimental section.

(4) We completely rewrote the abstract, introduction, problem sections to reflect the new scope of the article. The content of the article, including the notations and figures, have been substantially revised to improve the presentation.