

Abstract

Development of a Smart Sensor Network with Application in Self-Adapting Energy Management Systems for Buildings [†]

Ciprian Lapusan *, Olimpiu Hancu and Ciprian Rad

Technical University of Cluj-Napoca, 400114 Cluj-Napoca, Romania; olimpiu.hancu@mdm.utcluj.ro (O.H.); ciprian.rad@mdm.utcluj.ro (C.R.)

* Correspondence: ciprian.lapusan@mdm.utcluj.ro

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To satisfy ever-increasing needs for efficiency and environment protection, the energy management systems for buildings have become more and more complex products that integrate advanced sensor networks and control algorithms into their structure. The integration of these two modules allows the development of new context-aware responses for the control strategies that allows the system to adapt better to the building and environment dynamics. In this paper, the results of developing such a system are presented. The controlled environment was developed using Matlab simulation software. The smart sensor network was developed and optimized using this virtual environment. The data provided by the sensor network are used to better control the energy consumption in the building. For this, a model-based control algorithm was developed which takes advantage of the extra information provided by the network. The obtained system is tested using hardware in the loop approach on the dSpace and Discovery STM32F4 real-time simulation platforms. The obtained results show that the proposed approach offers good results and increases the efficiency of the building.

Conflicts of Interest: The authors declare no conflict of interest.



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