

PhD Oral Defense

Date: 10 Dec 2020 (Thursday)

Time: 5:00 p.m.

Thesis Title

Computational Studies for Smart Building Applications: Localization, Car Parking and Healthcare



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Abstract

The concept of “smart building” is to establish a vast network of sensors and devices for achieving ubiquitous data collection and access, thereby bringing social benefits. In recent years, smart building technology has developed rapidly, from personal applications to industrial applications. A tremendous number of sensors have been deployed for various purposes, such as crowd control and air quality monitoring. These sensors require well-designed algorithms, schemes, and configurations to fulfill the requirements of different applications and to deliver the envisaged services. The development of smart building systems encounters various deficiencies, such as lack of systematic design tools and diverse system requirements. With these concerns in mind, this study addresses three smart building use cases to demonstrate the feasibility of exploiting evolutionary techniques in smart building development. Crowd management and healthcare are two essential smart building services. They can be applied in most residential and commercial buildings, such as object tracking, navigation, and remote health monitoring. Indoor localization, car parking, and healthcare are three crucial applications, and they can be generally found in most modern buildings. After analyzing the deficiencies of these applications, this study has developed three analytical works to overcome the deficiencies and make the applications smart, thereby enhancing citizens’ living quality.