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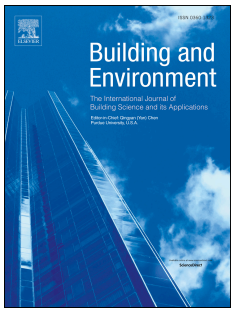

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PII: S0360-1323(18)30061-1

DOI: 10.1016/j.buildenv.2018.01.043

Reference: BAE 5279

To appear in: *Building and Environment*

Received Date: 20 November 2017

Revised Date: 11 January 2018

Accepted Date: 30 January 2018

Please cite this article as: Jeon Y, Cho C, Seo J, Kwon K, Park H, Oh S, Chung I-J, IoT-based occupancy detection system in indoor residential environments, *Building and Environment* (2018), doi: 10.1016/j.buildenv.2018.01.043.

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ACCEPTED MANUSCRIPT

IoT-based Occupancy Detection System in Indoor Residential Environments

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Abstract

We propose an Internet of Things (IoT)-based occupancy detection system using change patterns of dust concentrations such as particulate matter. Previous research studies have used other features such as visual, chemical, or acoustic data. In this paper, the point extraction algorithm is proposed to construct triangular shapes, and their properties are used to detect occupancy in an indoor environment. For the verification of the proposed method, an IoT-based system is implemented for the occupancy detection in real residential environments. Finally, we analyze the experimental results, and compare them with those of other conventional approaches from a qualitative point of view.

Keywords: occupancy detection, pattern analysis, particulate matter, indoor residential environment, sensor data, data processing, intelligent information systems

1 Introduction

With the great success of Internet of Things (IoT) technologies in mobile web environments, the amount of sensor data generated from diverse sensors in the heterogeneous distributed systems has increased considerably as the sensing abilities and number of types of small mobile devices have increased drastically. Therefore, it is important to gain insights and meaningful information from the sensor data in context-aware computing environments. For

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