Chapter 29
Agent Based Noise Detection Using Real Time Data Analysis Towards Green Environment

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ABSTRACT

The authors propose an agent-based noise detection system based on Internet of Things (IOT) for handling abnormality in sound levels of a specified zone and further analysis of data received. Our research work is important for managing different noise levels and to control fully automated emergency response unlike existing mechanism. Increased requirement of safety and security of typical organizations triggers the idea of IOT based framework creating safer zone for highly secured data and/or substances. Agents are to be considered for producing a particular effect based on external noise values. In this article, the authors have used noise agents to identify noise levels in enclosed spaces. The safety of any zone or organization should be monitored having live noise data generated by sensors situated in specific locations of users' interests at any time instance. Generated live data is sent for further analysis for identifying noise patterns. These noise patterns determine intensity of abnormality in real environments. Their predefined set of values identifies the intensity and helps system to respond appropriately. Based on specific values of noise, distinct thresholds are decided for different enclosed zones. An alert system is based on distinct thresholds. Noise sensors have been used at sender's side and receiver's side for smooth transmission of data. New theory based on data sent, data received and dependency of noise of an agent on weightage factors has been proposed in this paper.

INTRODUCTION

Overview

In computer science, agent means functional modules that carry out automatic action in a real time situation. Agent architecture is a template for software agents and control systems. Agent based model is used for simulation and interactions between modules (as found on https://en.wikipedia.org/wiki/Agent). Agents accepting data in real time ceaselessly monitor the safe zone. Data continuously being accepted by sender also aid in assimilation of normal values. Senders integrate data for sending over World Wide Web (WWW) (Beevi, 2016) to be received by receiver agents. Each detail of substances is recorded & analysed, and further emergency measurements are executed to handle real time situations using the concept of IOT (Ortiz et al., 2014). Any deviation from typical range of value induces presence of noise in the system. Massive development of communication technologies has ensured user friendly services for fifth-generation of cellular technology. However, huge expansion needs increased resources and energy. Green & energy efficient applications are important for daily activities. A multi-label classification method (Tsoumakas & Katakis, 2007; Chen et al., 2009) has been introduced in 5G applications for doctor recommendations (Guo et al., 2016). Rapid expansion of cloud services has substantially affected our society. Demand based growth of green services has posed as a challenge to cloud provider as how to manage green Service Level Agreements (SLAs) (Hasan et al., 2015) for customers and still satisfy the business objectives maximizing the profit. Virtualization of green energy is provided for addressing unavailability issues. SLA between consumer and service integrator is termed as CSLA, and is further extended to support Green SLA, and has immensely helped in green energy management (Haque et al., 2013).

Motivation

We are motivated to do research on the performance evaluation in IOT based design and deployment. Our paper intends to propose a safe zone in organization. A safe zone is assumed as any predetermined area where total control over any type of encroachment is exercised. Intrusion is detected, depending on identification of noise level. Noise data would be collected using agents from environment in real time basis, and further the collected data is sent to appropriate receivers for data analysis and storage.

The motivation of proposed approach is to exhibit overall procedure for data transmission and receiving using distinct agent-based modules. We have established relationships between distinct features with respect to time, data, 8051 circuits, and controllers; number of queries, and received data; interaction between different modules / agents.

Aim

Aims of our research work are as follows:

1. Agents check noise within an area of specific organization in real time;
2. System response based on noise detection agent within system;
3. Processing details of noise;
4. Record and analyse details of noise before storing to database;

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