Chapter 36
Safe and Secure Home Automation Through IoT Applications:
A Sensor and IC-Based Implementation for Digital Transformation

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ABSTRACT

In current conditions, robotization has changed into the fundamental piece of our lives. Everybody is completely subject to mechanization whether it is an extraordinary bundling or home robotization. So as to bring home automation into thought, everybody now needs a heterogeneous state security, and in our task on residential robotization, such high security highlights are completely on the best possible consumption for this reason. In light of the structure of the interruption zone, there are some fundamental interests in it. Piezoelectric sensors are compelling for sharpening appropriated wellbeing checking and structures. An intrusion detection system (IDS) is a structure that screen for suspicious movement and issues alarms when such advancement is found. While impossible to miss worthiness and presentation is, some obstruction divulgence structures are fit to take practice when poisonous improvement or peculiar action is perceived.

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INTRODUCTION

The Manuscript presents a detailed study wherein the Introduction section, the basic concepts of Big data, and CPS and IoT are explained. In the Literature Survey, the recent work of a few researchers has been explained. In the next section, the structure and functioning of the components used in this experiment like Arduino Uno, Piezoelectric-Transducer Sensor, RFID, LCD, GSM, and fingerprint sensor have been presented. Their working procedure has been explained in detail. At last, the Application aspect for home security using these components is elaborated. Then the future research direction, novelty, limitations, and conclusion are reflected.

An Intrusion Detection System (IDS) is a structure working on the principle of the Cyber-Physical System principle that screen for suspicious movement and issues alarms when such advancement is found. While impossible to miss worthiness and presentation is as far as possible, some obstruction divulgence structures are fit to take practice when poisonous improvement or peculiar action is perceived.

Security is an important issue nowadays, as the possibilities of intrusion are increasing day by day. The Cyber-Physical System is a network of physical objects devices, vehicles, buildings, and other items embedded with electronics software sensors, and network connectivity that enables these objects to collect and exchange data.

Big Data Analysis

It is the technology that is used to handle big data. Data science and predictive analytics can help you to achieve your business goals. Learn the process and benefits of implementing big data into your business. Big data analytics is the often complex process of examining large and varied data sets, or big data, to uncover information -- such as hidden patterns, unknown correlations, market trends, and customer preferences -- that can help organizations make informed business decisions.

Cyber-Physical System

It is a system in which a mechanism is controlled or monitored by computer-based algorithms. It includes autonomous automobile systems, robotics, automatic pilot avionics, and many more. In light of the structure of the interruption zone and there are some fundamental interests in it. The cyber-physical system involves enhancing the network to proficiently collect and analyze the data from various sensors and actuators then sends the data to the mobile phone or a personal computer over a wireless connection. Cyber-Physical Systems have progressed essentially in the last couple of years since it has created a new era in the world of information and communication technologies.

The Cyber-Physical System allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy, and economic benefit; when it is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyber-physical systems, which also encompasses technologies such as smart environment grids, smart homes, intelligent transportation, and smart cities.