IoT Based Smart Home Automation System Over The Cloud

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Abstract: Due to the rapid development in the field of the Automation industry, human life is becoming more advanced and better in all aspects. In the present scenario, Automated systems are being preferred over the non-automated system. With the rapid growth in the number of consumers using the internet over the past years, the Internet has become an important part of life, and IoT is the newest and emerging internet technology. Internet of things plays an important role in human life as well as in the educational field because they are able to provide information and complete the given tasks while we are busy doing some other work. The proposed system consists of a hardware interface and software interface. In the hardware interface, the integration of ESP8266 Wi-Fi technology for controlling home appliances and sensors is manifested, and an application is provided for controlling to multiple users of home, with smart phones, tablets, and laptops. This system is one of the best methods for controlling home devices with ease with multiple users and one of the best method for an energy management system. The access to the whole system is given by its admin only to different users. This system is also expandable for controlling various appliances used at home and also for the security and safety purpose of the home through sensors as long as it exists on Wi-Fi network coverage. Home automation is based on multimodal application that can be operated using voice recognition command of the user using the Google Assistant or through a web based application. Thus, main objective of this work is to make our home automation system more secure and intelligent.

I. INTRODUCTION

Human-machine interaction (HMI) has become, the more realistic in day-to-day life due to the advancement in the technology. Today, HMI research has moved one step ahead and switched onto the Internet, which was previously used for communication and now used for things, i.e., IoT (Internet of Things). The aim of this application is to connect any things through the Internet that can be accessible from anywhere. IoT application are not limited to one particular field. It has shown the significant contribution from small scale applications to the large scale applications such as, Ecommerce, Coal Mine, Wearable device, Smart Grid, Laboratory Monitoring, Agriculture and many other domains. Though, we have received tremendous improvement in the technology, but still power consumption is one of the big issue all over the world. As per report, the Information and Communication Technologies (ICT) alone uses 4.7% of the world's electricity, which may likely to be increased to 10% as per report. India, share about the 17% of the world population has limited energy resources and share roughly 0.6%, 0.4% and 7%, for world gas, oil and coal reserves respectively.

However, in India, the electricity consumption due to ICT usage has increased from 24 TWh to 31 TWh in the last five years (for the period 2009-2014). This has resulted in electricity consumption of roughly 6.5% in 2015. Thus, saving of the power is the main concern, which is the basic aim of this project. To save the power consumption, we have proposed the smart, energy efficient home automation system using IoT. Thus, aim of this research to save the power consumption (reducing the electricity bills) and at the same time provide the safety and security of the home equipment's

II. SMART HOME AUTOMATION SYSTEM

As demand for electricity is increasing day-by-day, therefore, smart home is the upcoming area of research to provide the remote access for controlling the home appliance using IoT. IoT based application has also provided the boom for old aged people and the person having some sort of disability. This allows the user to control the home automation device such as fan, bulb etc., without even making any physical connection. Home automation using MQTT is presented in for sending/receiving data from the sensor. For this Raspberry pi is used as a gateway for accessing the data from the sensor which are used to measure the temperature and humidity of the room. Another home automation system is presented in which are based on Raspberry pi and user can control their home appliance using the web-based interface. In home automation using mobile is reported in which system is designed using ZigBee. IoT has provided the applications to turn non-smart device into smart device, which allow users to access these devices through the Internet. It converts the home into smart home and provides a more robust method of controlling the home appliance. Also, the security can be added with the help of installed camera in the home, which can be traced through the Internet. Thus, user can monitor their home and can turn ON/OFF their appliances which will definitely going to save both the electricity and electric bill. Other features that can be included in the smart home for security purpose is to include the sensors and cameras that can prevent the intruder from entering into your home. Also, making the system more intelligent, that can turn on the light and fan of the room as soon as it detects the presence of the person With this motivation, we develop IoT based home automation system which uses

Sensor-Based Datasets for Human Activity Affirmation

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ABSTRACT The research area of Ambient Assisted Living (AAL) has led to the development of Activity Recognition Systems (ARS) based on Human Activity Recognition (HAR). These systems improve the quality of life and the health care of the elderly and dependent people. However, before making them available to end users, it is necessary to evaluate their performance in recognising Activities of Daily Living (ADL), using dataset benchmarks in experimental scenarios. For that reason, the scientific community has developed and provided a huge amount of datasets for HAR. Therefore, identifying which ones to use in the evaluation process and which techniques are the most appropriate for prediction of HAR in a specific context is not a trivial task and is key to further progress in this area of research. This work presents a Systematic Review of Literature (SRL) of the sensor-based datasets used to evaluate ARS. On the one hand, an analysis of different variables taken from indexed publications related to this field was performed. The sources of information are journals, proceedings and books located in specialised databases. The analysed variables characterise publications by year, database, type, quartile, country of origin and destination, using scientometrics, which allowed identification of the dataset most used by researchers. On the other hand, descriptive and functional variables were analysed for each of the identified datasets: occupation, annotation, approach, segmentation, representation, feature selection, balancing and addition of instances, and classifier used for recognition. This paper provides an analysis of the sensor-based datasets used in HAR to date, identifying the most appropriate dataset to evaluate ARS and the classification techniques that generate better results.

INDEX TERMS Ambient Assisted Living – AAL, Human Activity Recognition – HAR, Activities of Daily Living – ADL, Activity Recognition Systems – ARS, dataset.

I. INTRODUCTION

The care of elderly dependent people who have difficulties to effectively develop ADL requires a lot of attention and dedication, because both the lifestyle and the health state of these people are affected. The proliferation of problems associated with dementia in older adults between 74 and 84 years of age [1] constitutes one of the main public health challenges worldwide. Due to this fact, secondary problems are generated that affect mental, physical and mobility capabilities [2-4]. In addition, there is a decline in basic communication skills, such as writing, speaking and performing simple and complex motor activities (cooking, taking medications and paying bills, among others) [5].

Nowadays, there has been a growing need for society to take care of their health integrating the use of technology. HAR enables monitoring of people's quality of life and more features and functionalities arise in this area over time, relying on a wide repertoire of hardware and software components. The research area of AAL has influenced the generation of reminder solutions, as a support for people suffering from neurodegenerative diseases. Proof of this is the implementation of several solutions in indoor environments, which capture the data generated from the interactions of people with an intelligent environment [6]. The objectives of HAR, based on the analysis of ADL [7], are: 1) the creation of predictive models that allow the classification of the normal and abnormal behaviour of individuals [8], 2) to provide the necessary tools for the caregiver and the medical team to identify the activities carried out by them and generate preventive and corrective measures.

The data collected from heterogeneous sensors deployed in smart environments or from sensors attached to the body (wearables), are stored in datasets. In this way, different modalities of data collection have been proposed: video [910], audio [11-12] and binary sensors [6,13] or portable sensors deployed on the body such as accelerometers and gyroscopes [14-15], among others. The dataset is then used to train different machine learning techniques that predict the behaviour of people with different purposes, such as sending early warnings to caregivers and mitigating the risks related to the deterioration of the health of the monitored people.

Currently there is a large amount of datasets for HAR. Therefore, identifying which ones to use in the evaluation process of an ARS and which techniques (in the phases of preprocessing, extraction features, feature selection and transformation, classification and post-classification) are the most appropriate to improve the rates of Activity Recognition (AR) is a complex task. The exploratory process of identifying

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Abstract:

The advent of artificial intelligence (AI) and the digital revolution has had a profound impact on global financial exchanges. This research paper explores the transformational effects of AI and digital technologies on face-to-face interactions within these exchanges. By analyzing the benefits, challenges, and implications of this shift, we aim to provide a comprehensive understanding of the role that AI and digitalization play in shaping the future of global financial exchanges. The findings of this study highlight the potential for increased efficiency, accessibility, and innovation, while also raising concerns regarding privacy, security, and ethical considerations.

Keywords: Face-To-Face, AI, Digital Revolution, Global Financial Exchanges

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Tracking Multiple Objects in Wireless Sensor Networks

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Abstract – Wireless sensor networks (WSN) depends on the algorithms and protocols for Communication and computation. In this paper, we implement sensors that sense the environment actively by emitting energy and measuring the reflected energy, a novel collaborative sensing scheme is used to sense multiple targets and high maneuvering targets in an energy efficient method. Joint sensing can increase the sensing region of an individual emitting sensor and generate multiple sensor measurements simultaneously. In order to conserve energy the sensors is used to estimate the target state using sensor measurements and to predict the target location and hence the tracking accuracy, as compared to individual sensing. Multiple and high maneuvering targets are identified with energy efficient.

Index Terms—quality of information; target tracking; joint sensing; sensor scheduling; Kalman filter

1. INTRODUCTION

With the introduction of wireless communication capable sensing platforms, Typical sensor-based systems comprise lower-level sensing modules that take environmental measurements and transform these measurements into useful information. Whenever the information derived from the sensed data indicates that an event of interest has occurred a decision maker will make a decision which will cause an action to be taken.

Typically, a wireless sensor network (WSN) is applicationdriven and mission-critical. Therefore, the information quality (IQ) is critical for the end users, service providers and the system designers. To provide accurate IQ in WSNs is challenging due to the resource-constrained, dynamic and distributed nature of the network.

Recently, IQ is receiving increasing interests for various WSN applications. The relationship between the sensor sampling rate and the QoI metric of timeliness and confidence is derived. In deciding how to proceed, decision makers make decisions based on the quality *of* the information (QoI). The quality of the sensed data is captured via a collection of attributes that includes *Timeliness, Accuracy, Throughput* and *Cost.*

2. LITERATURE SURVEY 2.1 Multi-step adaptive sensor scheduling for target tracking in Wireless sensor networks

Sensor scheduling is essential to collaborative target tracking in Wireless Sensor Networks (WSNs). In this paper, they present a Multi-step Adaptive Sensor Scheduling algorithm (MASS) by selecting the next tasking sensor and its associated sampling interval based on the prediction of tracking accuracy and energy cost. Simulation results show that, compared with the traditional non-adaptive sensor scheduling algorithm and the single-step adaptive sensor scheduling algorithm, MASS can achieve fast tracking speed and superior energy efficiency without degrading the tracking accuracy. As the future work, more advanced techniques are required for adaptive sensor scheduling .

2.2 Energy-Efficient Distributed Adaptive Multisensor Scheduling for Target Tracking in Wireless Sensor Networks

Single-sensor-based collaborative target tracking in wireless sensor networks (WSNs) suffers from low tracking accuracy and lack of reliability In this paper, an adaptive energyefficient multisensor scheduling scheme is proposed for collaborative target tracking in WSNs. It calculates the optimal sampling interval to satisfy a specification on predicted tracking accuracy, selects the cluster of tasking sensors according to their joint detection probability, and designates one of the tasking sensors as the cluster head for estimation update and sensor scheduling according to a cluster head energy measure

A Data Placing Police Established on Genetic Algorithm in Cloud Computing

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Abstract

Cloud computing has become a new platform for personal computing. Cloud computing provides high performance computing resources and mass storage resources. Cloud providers use the distributed cloud computing for the better cloud services. This means that we can minimize the data scheduling between the data centers. The use of genetic algorithms to address the data placement problems in cloud computing. The experimental results show that genetic algorithm can effectively work out the approximate optimal data placement, and minimize the data scheduling between data centers.

Keywords

Cloud computing, Data placement, Genetic algorithm

I. INTRODUCTION

Cloud computing, as well on-demand computing[1], is a kind of Internet-based computing that provides community dealing out property and information to computers and other devices on demand. It is a model for enable all over the place, on-demand right to use to a shared collection of configurable computing assets. Cloud computing and storage solutions make available users and enterprise with various capabilities to store and process their data in third-party data centers. It relies on sharing of resources to achieve consistency and economy of scale, similar to a utility (like the electrical energy grid over a network). Cloud providers naturally use a **"pay as you go"** model. The current accessibility of highcapacity networks, not costly computers and storage space devices as well as the acknowledged acceptance of hardware virtualization, serviceoriented devise and autonomic and utility computing have led to a growth in cloud computing.

Deciding how to assign data items to nodes in a distributed system in such way that they can be later retrieved [2]. It encompasses all data movement related activities such as transfer, staging, replication, space allocation and deallocation, registering and unregistering metadata, locating and retrieving data. Placing data on temporary local storage devices offers many advantages, but such "data placements also require careful management of storage resources and data movement, i.e. allocating storage space, staging-in of input data, staging-out of generated data, and deallocation of local storage after the data is safely stored at the destination. Data placement in distributed cloud computing can be divided into two types. One is static data placement most static data placement algorithms require complete knowledge of the workload statistics such as service times and access rates of all files. Second is dynamic data placement algorithms, generate file disk allocation schemes on-line to adopt to varying workload patterns without a prior knowledge of the files to be assigned in the future [3]-[7]. Dynamic data placement strategies update the placement strategy potentially upon every request. These dynamic strategies are very effective, when the data size is relatively small such as web proxy caching. Whereas large size applications like distributed video servers, dynamic schemes become less useful. Sometimes we want to access the data more than one data center. At the time we can get the data scheduling between data centers. Because of the huge size of data and limited bandwidth, data scheduling between data centers has become huge problem. In data intensive computing if multiple computations are jointly process multiple datasets in frequent way, these data sets are supposed to be correlative with each other. The objective of data scheduling is partly to ensure that most important data are sent first, partly to ensure that any transmission is cost efficient. The data scheduling applies to data sent between the mobile host and the GSM.

II. RELATED WORK: