Journal of Android and IOS Applications and Testing

Volume No. 9

Issue No. 1

January - April 2024

Journal of Android and IOS Applications and Testing

Aims and Scope

This Journal involves the basic principles of Android and IOS Applications and Testing where iOS (originally iPhone OS) is a mobile operating system created and developed by Apple Inc. and distributed exclusively for Apple hardware and Android is a mobile operating system (OS) based on the Linux kernel and currently developed by Google.

Characteristics of Android
Characteristics of IOS
Mobile Operating System
Linux Kernel
Google Play
Open Source Programming
Open Source Libraries Unit Testing
Acceptance Testing
Linux
Unix

Journal of Android and IOS Applications and Testing

Editors

Journal of Android and IOS Applications and Testing

Contents

Study of OwnCloud Replication of Mobile Information on ownCloud

Snehal S. Choudhari, Payal R. Chandre

Department of Computer Science and Engineering, Jawaharlal Nehru Collage of Engineering, Aurangabad, India

A B S T R A C T

Main aim of this paper is to produce info on ownCloud. Several staff use cloud primarily based services to share sensitive company knowledge with one another, vendors, customers and partners. They synchronize knowledge to their personal devices and residential compute rs in a trial to try to to their jobs quickly and with efficiency. Replication is that the method of making and managing duplicate version of info. It not solely copies the info; however, additionally synchronize the set of duplicates in order that changes created in one replica area unit created in different info.

Keywords: Open source, data sharing, syncing, security

NTRODUCTION

OwnCloud is a client-server software for creating and using file hosting services. OwnCloud is similar to dropbox where ownCloud is open-source and free of cost to use so that anyone can install and operate it without paying any cost. Mobile cloud storage is a form of cloud storage that is accessible on mobile device such as laptops, tablets and smartphones. Mobilecloud storage providers offer services that allow the user to create and organize files, folders, music, photos, similar to their cloud computing modals [1, 2].

ARCHITECTURE

The project can be designed as a client and an ownCloud server. This server manages and protects file sharing services. The administrators have control on all the ownCloud resources through the web interface provided by its server [3–5].

OwnCloud is file system and storage agnostic. It protects our files as we would asset any other file in our infrastructure. The firewall provides exceptional flexibility and control to the admin. The server also manages the API access to ownCloud. While it also provides internal processing machine that is needed for delivering high performance file sharing services [6, 7].

OwnCloud also provides encryption for user files. It can easily extend using mobile libraries, open APIs and plug-in applications. OwnCloud core provides the features like text editor, virus scanner, file versioning and server-side encryption. ownCloud can be easily extended to do far more than basic file

sync and share [8, 9].

DESIGN

OwnCloud supports windows and MacOS for desktop clients and for mobile clients, it supports Android and iOS devices. Files and data can be accessed using web browser. Updated files from desktop clients or mobile client are pushed on cloud and update to the respective user. OwnCloud server is written in PHP and JavaScript for user friendly GUI.

OwnCloud is designed to work with database such as SQLite, MariaDB, Oracle Database, MySQL.

FEATURES

Sharing

This feature provides sharing of data that is present on ownCloud with friends by providing links. This feature allows sharing images, file and documents. The app supported by ownCloud allows this sharing. Admin has control over sharing activities.

Syncing

The synchronization is provided by ownCloud that is the data when inserted in the device will automatically transfer to the server. This feature is known as syncing of the data [10].

Universal File Access

Universal file access is the feature that provides the access regardless of where the data lives. User can access the data at anytime, from anywhere. Users can access company files on any device from anywhere.

File Favorites

This feature allows user to add only the data that user wants. Everyday files with a search filter setting that brings up all of your favorited files

Share Point Integration

With this feature, user can access their shared point document libraries. The ownCloud app is connected to one or more document library using share point web service interface. Share point is external storage location for ownCloud.

APPLICATIONS

OwnCloud is widely used in various fields like medical and in government and public sectors.

OwnCloud Healthcare Applications

OwnCloud is popular in healthcare solution and life science organization. OwnCloud is deployed within organization's IT infrastructure. It also provide mobility and ease of use needed for the healthcare and life science processes.

Government and Public Sector

OwnCloud application area is government and public sector where document collaboration is required. It is used for sharing information of case, disaster response plan and regulatory documents, video and audio files etc. OwnCloud's mobile applications make secure file sharing a breeze. Users can upload,

download, move files using tablets and smartphones.

CONCLUSION

Cloud computing is an everlasting computing environment where data are delivered on-demand to authenticated devices in a secured manner and users utilize a shared and elastic Infrastructure. Seamlessly into existing infrastructure, management and security tools; Extend functionality easily through a comprehensive set of APIs, and still provide the polished, professional user experiences employees have come to value from consumer-grade services, running on all popular desktop and mobile devices. But do not take our word for it, point your browser to www.ownCloud.com and take ownCloud for a test drive today. OwnCloud setup is cost efficient method and easy to implement and maintain.

REFERENCES

1. Official Company Website

2. Jobke, Morris (19 November 2015). Maintenance and Release Schedule". Retrieved2015-11-20.

3. Integrate ownCloud in GNOME". gnome.org. Retrieved 1 January 2014.

4. "ownCloud integration". kolab.org. Retrieved 1 January 2014.

5. "Raspberry Pi Owncloud (Dropbox Clone)". raspberrypihelp.net. Retrieved 1 January2014.

6. "ownCloud and sabre/dav". owncloud.org. Retrieved 7 April 2015.

7. Available at: http://doc.owncloud.org/server/7.0/ad min_manual/configuration/database_configuration.html.

8. Peter Mell, Tim Grance. The NIST definition of cloud computing; 2009.

9. Available at: www.eucalyptus.com.

10. Available at: www.opennebula.org.

Robot Control using Android Smartphone

Dipak Gonde, Sumedh Jadhav, Mandar Lokhande

Department of CSE, JNEC, Aurangabad, India

A B S T R A C T

An open-source platform Android has been widely used in smart phones. Android has complete software package consisting of an operating system, middle ware layer and core applications. Android application, Smart phones are becoming each time more powerful and equipped with several accessories that are useful for robots. The purpose of our project is to provide powerful computational android platforms with simpler robot's hardware architecture. This project describes how to control a robot using mobile through Bluetooth communication, some features about Bluetooth technology, components of the mobile and robot. For project we developed two android applications, in that first application sends instruction to the other application which is placed in another smart phone on robot. We are developing the remote buttons in the second android app by which we can control the robot motion, direction with them and also use mobiles basic features like camera, video. We use Bluetooth communication to interface controller and android. We derived simple solutions to provide a framework for building robots with very low cost but with high computation and sensing capabilities provided by the smart phone that is used as a control device.

Keywords: Android, smart phones, robots, architecture, video

INTRODUCTION

The project aims in planning a golem which will be operated exploitation robot transportable. The dominant of the golem is finished wirelessly through robot sensible phone exploitation the Bluetooth feature gift in it. Here, within the project the robot sensible phone is employed as a distant management for operational the golem.

The dominant device of the entire system could be a Microcontroller. Bluetooth module, DC motors square measure interfaced to the Microcontroller.

The information received by the Bluetooth module from robot sensible phone is fed as input to the controller. The controller acts consequently on the DC motors of the golem. In achieving the task the controller is loaded with program written exploitation Embedded 'C' language [1].

INFORMATION ABOUT THE SYSTEM

There are many mechanism and controllers that can control a robot and other remote controlled devices.

But we have to create extra space for remote's and other controlling devices. In this system only two android applications can manage whole things. First app can sends text to second app which is in the smart phone. It can take the input as a distance and according to that it can give inputs to the controller for work. Sensors can manage the avoiding of obstacles which are present in the goal path [2, 3].

OVERVIEW OF THE SYSTEM

Our system aims to achieve the target to design a system that can provide following functionality. a. develops android applications that will act as an remote of a robot.

b. Develop a robot which will be helpful for travelling, survey, military area.

c. Here, the focus is on the latest technology of android and robot also called as mobot. An android

smartphone [4].

d. and the technology of android is vast and can be used to interact with embedded system. Mobile, robot and Bluetooth are the on-going technologies which can be used for the benefit of mankind.The system will consist of following four parts:

a. Bluetooth Technology,
b. Android Smartphone
c. Microcontroller and
d. DC Motor.
e. Sensor.

Android smartphone will act as remote of the system, Bluetooth will act as the connection link between robot and android smartphone, microcontroller will act as the brain of the robot, and DC motor will help us to move the robot and sensors use for avoiding and measure distance of obstacles.

FUNCTIONALITY PROVIDED BY THE SYSTEM

Robot control design using a smartphone is the direct usage of a simple device that is as simple as our easy to carry, the mobile phones to drive a robot which is considered quiet complex when comparisons are made to the mobile phones. Here in this system the mobile phone will carry out the controlling of robot with the help of a smartphone application. The smartphone application will be developed in such a way that it is compatible to all the current versions of Android. The smartphone application will communicate to the robot with the help of Bluetooth module which is fitted on the Robot. The robot is mechanically modified in order to fit the Bluetooth module, sensor and microcontroller. It can also take sensor values from sensor and move according to build-in program. The microcontroller will read the instructions from the smartphone application with the help of Bluetooth and gradually will control the Robot with the help of DC motor.

SYSTEM INTERFACES, INPUTS AND OUTPUTS

The system interface consists of following entities-Smartphone device, Android Applications, Robot, Microcontroller, sensor and DC Motor. The Smartphone device acts as the base hardware on which the Android Application plays the role of an interface. The input is given to the robot through the application which is fed to the skateboard through Bluetooth module which transfers the instructions passed by the smartphone application to the skateboard. The DC motor is also in synchronization with the microcontroller which makes the robot perform the required kinds of motion.

EXPECTED OUTCOMES

The robot should be used for travelling, survey, military as a basic outcome with minimal energy usage. Since the motors used are completely environment friendly, the travelling for shorter distances could be made feasible.

WORKING OF THE PROPOSED SYSTEM

Our proposed system consists of following components:

a) Android Smartphone
b) Bluetooth Module
c) Microcontroller

d) DC Power Supply
e) Motor Driver
f) DC Motor
g) Sensor

An Android smartphone will act as remote controlled device for movement of the robot. An Android application will be developed for the same. The application will support only the 2.2 and above versions of Android Operating System. The Bluetooth module will act as an interface between Smartphone and microcontroller. We will be using HC-05 Bluetooth module for the system, which can be used as either master or slave. Generally our master will be smartphone and slave will be Bluetooth module. Bluetooth module will give the commands given by smartphone to the microcontroller. Microcontroller will act as the brain of the robot. The robot movement will be decided by the microcontroller. In this system we will be using microcontroller named Arduino Uno which contains Atmega 328p microcontroller chip. The microcontroller will be programmed with the help of the Embedded C programming. Arduino has its own programming environment through which the microcontroller can be programed. As our system is for travelling purpose we will be using a DC motor. It will generate high amount of power and torque which will be sufficient to drive a human being. A motor driver will be used to control the DC motor, will we connected to the microcontroller and the Bluetooth module will be connected to thesame. In this proposed system we will be using any rechargeable battery to supply power to the electronic components of the system. Mainly the microcontroller and DC motor will be in need of power supply.The model represents a general idea how our robot will look like and it is interfacing with the android smartphone.

Our robot will be made up of following components:
a. Skateboard
b. DC Motor
c. Motor Driver
d. Microcontroller
e. Bluetooth Module
f. Battery
f. Sensor

All of the above mentioned components will be mounted on the skateboard. And as mentioned in the system architecture the working will be processed.
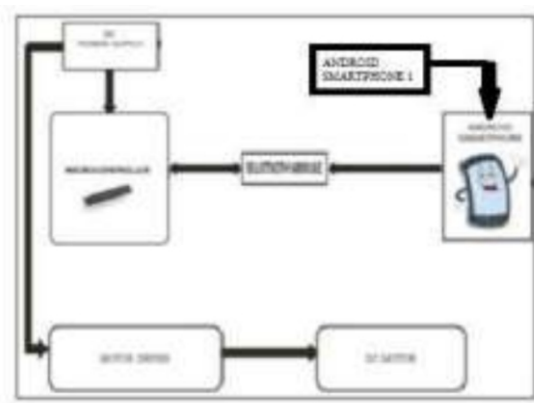

Fig. 1: DC motor is 100 rpm which will

to drive about 10–30 gm weight. Motor driver is used to control DC motor. The microcontroller is the Brain of the robot and is used to connect the smartphone through the Bluetooth module. The motor belt driver is used to connect the wheels of the skateboard and the dc motor through driving cog. The entire electronic component except the motor and belt will be kept in Electronic component case.

The android smartphone will act as a remote control for the robot. Acceleration and de-acceleration of the robot can be done with the help of the android smartphone. All Electronic and mechanical component will be mounted on the skateboard. To provide mechanical strength to the board for bearing extra weight an elastic property using aluminum covering over the joined with resin will be provided. This will increase the physical strength of the robot.

CONCLUSION

The proposed system shows how the android smartphone can be used as remote controller for robot and various embedded technologies with the help of the Bluetooth technology. The proposed system also shows that how a robot can be used for travel, servey, confidential purpose. The operating system of smartphone is Android, and it can develop effective remote control program and by using Bluetooth component, the communication between smartphone and robot can be realized, which makes it simple and convenient to control robot.

REFERENCES

1. Xiaolu et.al. Robot control design based on smartphone.

2. Control and Decision Conference (CCDC), 2013 25th Chinese. IEEE, 2013.

3. Yeon-Gyunkim et.al. Smartphone controlled user calling system for a mobile robot. Robotics (ISR), 2013 44th International Symposium on IEEE, 2013.

4. Mrumal. K. Pathak, Javed Khan, Aarushi Koul, et al. Robot control design using android smartphone. IEEE

A Review on Smart Home Automation using Virtue of IoT

Vaibhavkumar Yadav, Shubham Borate, Soniya Devar, Rohit Gaikwad, A. B. Gavali

Department of Computer Engineering, SPVP's S.B. Patil College of Engineering, SPPU, Indapur, Pune, India

A B S T R A C T

Smart home automation system in daily routine plays a starring role which helps in reducing work. Smart home automation is flattering trendy due to its various advantages. With development of Automation technology, life is getting effortless and uncomplicated in all aspects and it is intended to save the electric power and human energy besides automated systems are being favored more than manual system. With the speedy enhancement in the number of users of internet over the past decade has made Internet an essential part of life. Nowadays IoT is the most recent and promising internet technology. This paper describes the literature survey of existing system. We will perceive a review of the technology used to design this system. Comparisons of different system technology are studied in this paper.

Keywords: Intel galileo gen 2, IoT, sensors, smart home, Wi-FI

INTRODUCTION

Internet of things (IoT) is an environment in which all the devices communicate with each other to make the world smarter [1,2]. IoT has the endowment to broadcast the information to the devices without intercommunication between human-to human or human-to-computer. In this eon, IoT is the promoted topic among technology giants and business communities. IoT is a patchwork of interconnected things which are encapsulated with sensors, software, network connectivity and necessary electronics that enables them to aggregate and exchange data making them responsive. Smart home automation is the urban extension of building automation and involves the regulation and computerization of lighting, heating, ventilation, air conditioning and security as well as home appliances such as dryers, ovens, freezers that use Wi-Fi for remote monitoring [3]. Present systems broadly consist of switches and sensors connected to a foremost hub called a portal from which the system is governed by a user that is united either with a mobile phone software, tablet or a web interface often but not always via internet cloud services. This provides the user more control of their devices and can simplify many manual actions.

RELATED WORK

This section describes study of the previous works related to the proposed system.

Governing of Light

In the paper [4] problem is due to architecture limitation . The existing light control system cannot be successfully applied. A solution to this problem is automatically to adjust the home light intensity values by sensing the intensity of sunlight to enhance the energy efficiency.

In the paper [5] problem is the user has to switch on or off the light manually . A solution of this problem is when somebody enters the room led light switch on and when leaves the room the light will be off.

Power Window

In the paper [6] problem is window does not open automatically . A solution of this problem is automatically turns up the glass upward when rainfall is detected and glass goes down when no rain detected.

In the paper [7] problem is at present electronic buttons and crank handles are used as control units for power window . A solution to this problem is introducing a touch screen interface for the same.

Smart Terrace Garden

In the paper [8] problem is systems are too expensive and not compatible with the app or both . A solution of this problem is it will help to save time, money and help the environment through reducing water loss.

Child Back to Home

In the paper [9] system is not present in the real world or unimplemented . The only idea related to this system is provided. On the basis of same idea there is the designof an application called child back to home.

From a study of the existing system, it is observed that it has various limitations. These limitations can be overcome using the proposed system.

COMPARATIVE STUDY

The existing system has many limitations such as the problem of energy consumption, wastage of water, child security etc. By using proposed system the energy consumption is going to reduce due to which the cost of the energy bills is also going to reduce. Now a day, wastage of water is the big issue and the existing system is not capable of dealing with these issues, but these issues can be solved by the proposed system. Now a days parents are working or many of the time they are out of the home and they are worried about their child security for e.g. The child returns to home from school or not. In this respect no other existing system which will tell the parents that child reaches at home from school safely. But by using proposed system parents will know about their child, whether returns or not.

CONCLUSION

After comparative study due to limitations of other existing systems, there was a proposal of a system which will give a better understanding of environmental conditions at home. After that there was discussion of smart home control and monitoring system using IoT. Use of different sensors that will be useful in implementing this system. With this system, there is management of flexible, smart home with low cost to adjust its environmental conditions and insist its errors with energy saving.

REFERENCES

1. Vinay sagar K N,Kusuma S M Student IV SEM, M.Tech, Digital Communication. Engg., MSRIT, Bangalore, India,"Home Automation Using Internet of Things",International Research Journal of Engineering and Technology (IRJET),Volume:02 Issue:03 June-2015.

2. Shruti Deshinge, Prof. M. N. Kakatkar, Dept. of E\&TC, Sinhgad College of Engineering, Pune, India,"IoT based Smart Home System for Monitoring Surrounding Condition",International Journal of Innovative Research in Computer and Communication Engineering, Vol. 4, Issue 6, June 2016.

3. Vinod Choudhary, Aniket Parab, Satyajit Bhapkar, Neetesh Jha, Ms. Medha Kulkarni, PVPPCOE/Dept. of IT, Mumbai, 400022, India, "Desgin and Implementation of Wi-Fi based Smart Home System", International Journal Of Engineering And Computer Science, Volume – 5 Issue -02

February, 2016.

4. Prof.M. Shobana, Prof.M. Amsaveni, Prof.S. Sugapriya, "Smart LED lighting system for street light", The International Journal of Engineering and Science (IJES) ISSN (e): 2319 –1813 ISSN (p): 2319 – 1805, March2015.

5. Gaurav Waradkar, Hitesh Ramina, Vinay Maitry, Tejasvi Ansurkar Prof. Mrs. Asha Rawat, Prof. Mr. Parth Das, "Automated room light controller with visitor counter", Imperial Journal of Interdisciplinary Research (IJIR) Vol2, Issue-4, 2016.

6. Imran Ahmed Khan, Khushboo Gupta, "Design of rain detection system for power window", International Journal of Advanced Research in Computer Science and Software Engineering, Volume 5, Issue 4, April 2015.

7. S. Parameshwara, Manu.S, Manjunath, Suren Sharan Navalgi, Vinay Mahadev Hunachyal, "Power windows using touch screen", International Research Journal of Engineering and Technology (IRJET), Volume: 03 Issue: 01, Jan-2016.

8. Pranshu Bansal, Michael Fields, Chirag Tailor, "Smart garden irrigation system", 2015.

9. Lisa Montgomery, "6 back school basics smart home", https://www.electronichouse.com/home-security/6-back-school-basics-smarthome/2016

Review on Vehicle Monitoring Security

Pramod T. Talole, Surekha R. Mandave, Bhagyashri G. Jaware

Dept of Information Technology, Anuradha Engg. College, Chikhli, India

A B S T R A C T

It is discovered that the majority of the accidents occur thanks to the driver's ignorance of traffic and safety rules. It's an observe for the drivers to drive the vehicle on the far side permissible limits. Looking on the parcel, and alternative conditions, speed restrictions could also be obligatory on drivers from time to time. Therefore, a system observation the speed and alternative want d vehicle parameters is put in within the vehicle to warn the motive force befittingly and intervene to regulate if necessary. One might not understand the instant position of a vehicle and it's time of arrival. Generally, the truck operators rely on intermittent telephone calls created by the drivers .To overcome such issues, an automatic observation system is established with observation stationslocatedat vital major junctions, cities through that the vehicles ply. Because the vehicle approaches a observation station, it's to mechanically establish itself and transfer crucial knowledge concerning the vehicle and operative conditions. The observation station will send changed management parameters and tips to the vehicle driver. For this purpose, we'd like a RF (radio frequency) transceiver system. In general, vehicle observation, chase and such activities square measure done victimisation separate systems and that they need some mechanical force as input. Speed is monitored victimisation meter and for dominant mechanical force is needed to decelerate it. Fuel level observation, proximity detection, battery observation, etc needs separate system. This paper presents a micro-controller-based management and observation system. Usually we'd like to use additional RF building blocks to produce RF link increasing the system quality. In such cases, a PSOC (Programmable System-On-Chip) micro-controller is utilized in place of standard approach. During this system, at first a building block is wont to monitor the standing of car and store it in memory. Then, same building block are organized as a receiver and also the system appearance for an approaching observation station. An equivalent building block is organized as transmitter and wont to transfer the vehicle info.

Keywords: Vehicle, Speed, PSOC, management, monitoring system

INTRODUCTION

The vehicle observance system will be simply enforced by victimization PSOC (Programmable system-on-chip). As aforesaid on top of, it will be dynamically reconfigured by fitly programming at the run time. However, this programming will be done by victimization high level language like 'C' with that most of the hardware designers would be acquainted. This makes 'C' the tongue for system-onchip. a moment pursuit system is required for vehicles carrying combustible fuels, explosives, etc. in such cases GPS (Global Positioning System) will be used additional effectively. This is often aiming to be costlier. This paper presents price effective and additional compact instrumentation for numerous applications. associate degree automatic observance system for vehicles will be established with observance stations set at major junctions, cities through that the vehicle ply. because the vehicle approach a observance station, it's to mechanicallydetermine itself and transfer essential knowledge regarding the vehicle and operative conditions like temperature, speed, fuel, battery indication, agent level etc. Of all the applications of GPS, Vehicle pursuit and direction systems have brought this technology to the everyday lifetime of human. Nowadays GPS fitted cars, ambulances, fleets and police vehicles area unit common sights on the roads of developed countries.

Known by several names like Automatic Vehicle Locating System (AVLS), Vehicle trailing and data System (VTIS), Mobile Asset Management System (MAMS), these systems supply a good tool for up the operational potency and utilization of the vehicles.GPS is employed within the vehicles for each trailing and navigation. Trailing systems change a base station to stay track of the vehicles while not the intervention of the driving force whereas navigation system helps the driving force to succeed in the destination. Whether or not navigation system or trailing system, the design is additional or less similar. The navigation system can have convenient, sometimes a graphic show for the driving force that isn't required for the trailing system. Vehicle trailing systems mix variety of well-developed technologies. To design the VMSS system, we tend to combined the GPSs ability to pin-point location at the side of the power of the world System for Mobile Communications (GSM) to speak with a sway center in a very wireless fashion. The system includes GPS-GSM modules and a base station referred to as the center. Allow us to concisely make a case for however VMSS works. So as to observe the vehicle, it's equipped with a GPS-GSM VMSS system. It receives GPS signals from satellites, computes the placement info, and so sends it to the center. With the vehicle location info, the center displays all of the vehicle positions on associate electronic map so as to simply monitor and management their routes. Besides trailing management, the center can even maintain wireless communication with the GPS units to produce different services like alarms, standing management, and system updates. The planning takes into thought necessary factors concerning each position and digital communication. Thus, the project integrates location determination (GPS) and cellular (GSM) 2 distinct and powerful technologies in a very single system.

Vehicle Monitoring and Security System design VMSS relies on a PIC microcontroller-based system equipped with a GPS receiver and a GSM Module in operation within the 900 mhz band. We tend to housed the components in one tiny plastic unit, that was then mounted on the vehicle and connected to GPS and GSM antennas. The position, identity, heading, and speed area unit transmitted either mechanically at user-defined time intervals or once a definite event happens with an allotted message (e.g.; accident, alert, or leaving/entering an admittible geographical area). The GPS Module outputs the vehicle location data like meridian, latitude, direction, and greenwich time each 5 minutes. The GSM wireless communications operate relies on a GSM network established in an exceedingly valid region and with a sound service supplier. Via the SMS provided by the GSM network, the placement data and also the standing of the GPS-GSM VMSS area unit sent to the centre. Meanwhile, the VMSS receives the management data from the centre via a similar SMS. Next, the GPS-GSM VMSS sends the data hold on within the microcontroller via an RS-232 interface. There are a unit 2 ways in which to use the VMSS alarm operate, which may be meaning by either a buzzer orconferred on digital display. The primary manner is to receive the command from the centre; second manner is to manually send the alarm data to the management center with the push of a button. The base station consists of telephone circuit modem(s) and GIS digital computer. The data regarding the vehicle is received at a base station and is then displayed on a computer primarily based map. Vehicle data are often viewed on electronic maps via the web or specialised software system. Geographic data Systems (GIS) provides a current, spatial, visual illustration of transit operations. It's a special variety of computerised management system during which geographic databases area unit associated with one via a typical set location coordinates.

Fig1: Stages of Vehicle Monitoring and Security System

STAGE 1
Driver starts his trip from the transport office. VMSS transmits the Driver I.D and the Vehicle I.D along with the position of the vehicle to the base station.
Stage 1 of Vehicle Monitoring and Security System
Stage 1 of Vehicle Monitoring and Security System

STAGE 2
Taxi picks up the employee/passenger from their residence. VMSS transmits the passenger I.D and therefore the Vehicle I.D along side the position of the vehicle to the bottom station. Thus base station are going to be ready to keep a track of the vehicle and so the employee/passenger.

STAGE 3
Taxi drops the employee/passenger to the work. VMSS transmits the rider I.D and therefore the Vehicle I.D along side the position of the vehicle to the bottom station.
Stage 3 of Vehicle Monitoring and Security System
Stage 3 of Vehicle Monitoring and Security System

STAGE 4:
Taxi picks the employee/passenger from the work. VMSS transmits the rider I.D and therefore the Vehicle I.D along side the position of the vehicle to the bottom station. Thus this permits the bottom station to estimate the time if needed and conjointly keep a track of the vehicle, rider and therefore the driver.

STAGE 5
Taxi drops the employee/passenger to their residence VMSS transmits the rider I.D and therefore the vehicle I.D along side the position of the vehicle to the bottom station and makes positive that the work is 100 percent complete.

FEATURES

Some of the important features of the PSoC are follows:
1. Powerful Harvard architecture processor.
2. Advanced peripherals.
3. Flexible on-chip memory.
4. Precisionn, programmable clocking
5. Programmable pin configuration.
6. Additional system resources.
7. Complete development tool.

OPERATION

The typical parameters of a vehicle are temperature, speed, fuel, battery indication, agent level etc. These are measured by applicable sensors, followed by sign a process block and are given to ADC block that's an interior block of PSOC. The specified parameters are actions are take and a renovated in memory for later reference. Typically the system acts as a receiver. This consists of a RF preamp, rectifier. These blocks, except for RF preamp, are pronto provided by PSOC. The output of rectifier is fed to the UART, that is designed as a receiver. The system appearance for an approaching observance station. Once it detects the observance station, UART is designed as transmitter and is employed to convert knowledge into serial kind, then modulated victimisation digital

APPLICATIONS

A.)ENGINE SPEED MONITORING & CONTROL SYSTEM

The rotating shaft is applied with a reflective coating and at the center a strip of black interesting material is placed. Lightweight is projected on to the present shaft. the sunshine is mirrored by the reflective surface and is absorbed by the black-colored strip. The mirrored lightweight is perceived by image detector, followed by signal electronic equipment. The signal is then applied to schmith trigger and corresponding pulses area unit obtained. They're fed toa counter. These blocks area unit pronto accessible in PSOC. The Engine speed is monitored once in a very second and regenerate to rate, and showedin the display unit. once the Engine speed exceeds a predefined price, the monitorintervenes, and activates a motor to use the brakes. during this method the speed Is mechanically restricted to a predefined price.

b.)FUEL LEVEL MONITORING

The fuel level are often monitored by employing a non-conducting, non-contact mensuration system mistreatment radical sonic waves. The system consists of a radical sonic electrical device. The electrical device is mounted at the highest of the fuel tank. radical sonic signals area unit sent within the downward direction.

These waves area unit mirrored from the fuel surface and also the receiver receives the mirrored signals. The time march on, in receiving the mirrored ray since the transmission of signal, offers the whole distance traveled by the rays. By evaluating the easy mathematical expressions we will simply calculate the fuel level within the fuel tank This data is keep in Memory and wont to warn the motive force concerning fuel level.

C.)COLLISION DETECTION SYSTEM

One of the major problems in road transport is Head on Collisions, in which lives almost. To avoid or minimize collisions, the distance between this vehicle and neighboring vehicles is to be monitored. As the gap reduces once again the driver is to warned. For this an Ultra sonic proximity sensor can used. This consists of ultra sonic transmitter and receiver. The Ultra sonic signals are transmitted at regular intervals. These signals, upon falling on approaching vehicle, would be reflected. The reflected signal is received by Receiver circuitry, and the time for receiving the reflecting the signal is calculated. The time reduces for an approaching vehicle. This can be checked by a program, which alerts the driver. All the building blocks such as Signal amplifiers are readily provided by PSoC.

d.)TEMPERATURE MONITOR

One major space that troubles the individuals is that the engine. If the warmth generated isn't removed and also the engine isn't cooled, in no time the engine starts to err before it involves grinding halt. It's higher to use the relays like thermistors. Here a resistance is employed to create a resistor divider network and also the junction voltage is fed to a voltage electronic equipment followed by ADC. Then the digitized price is employed by the program to see for the bounds and appropriate warning is issued to driver. If from now on rise of temperature is detected, then the monitor will cutoff fuel to engine and apply brakes, forcing the vehicle to prevent .In this all the blocks, i.e. Voltage electronic equipment, ADC is out there in PSOC, simplifying the implementation.

e.)BATTERY MONITOR

Battery voltage is another major problem auto field. Especially when the battery is
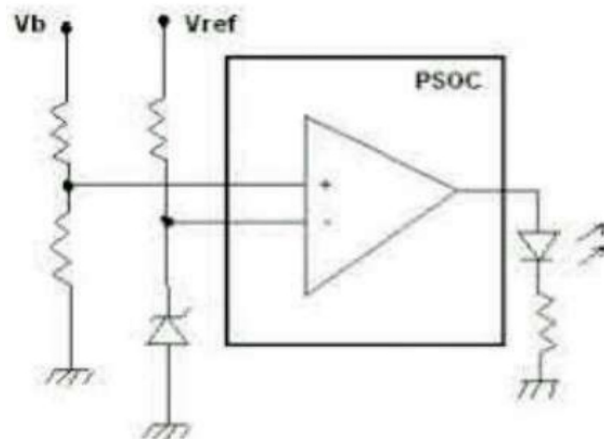

Fig2: Battery Monitor

Completely discharged, it causes problems. A comparator can monitor the battery status. To one input a ref voltage is applied and to the second input battery voltage is applied. If the battery voltage is greater than the reference voltage, the output of op-amp is positive. So the LED glows indicating battery is full. If the battery voltage is less than the reference voltage, output of the op-amp is negative and LED turns off indicating battery is to be charged. This can caution the driver.

CONCLUSION

In this fashionable, fast-paced and insecure world, it's become a basic necessity to remember of one's safety. Most risks occur in things whereby an worker travels for cash transactions. Conjointly the corporate to that he belongs ought to remember if there's some drawback. What if the person traveling is

tracked and conjointly secured within the case of an emergency?! Fantastic, isn't it? In fact it's and heres a system that functions as a pursuit and a security system. It's the VMSS. This technique will upset each pace and security.The on top of system is enforced exploitation ancient styles and approach. However the trend is to enter the systems into the gadgets, that they're dominant. This puts restrictions on designers for house, value and power consumption. In such cases one will intercommunicate small controller primarily based styles. The usage of PSOC simplifies style complexities, reduces the dimensions of system greatly and offers a bunch of peripheral devices which will be dynamically designed and used. It's expected that close to future PSOC over. takes different small controllers within the market and systems supported PSOC would be flooding the homes.

REFERENCES

1. Magazines:IEEE transactions, electronics for you.
2. Books:
3. The 8051 Micro Controller and Embedded Systems
4. Muhammad Ali Mazidi -Janice Gillispie Mazidi
5. Design with PIC Micro Controller
6. John .B .P eatman
7. Micro Controller technology-Peter Spasov
8. Liu binfan, "Development and its application in forestry in china , "
9. Forestry engineering,2008,124(1;-25.)
10. Li bo,"intelligent transportation system base on ARM," " proceeding of the world congress on intelligent control"

A Smart Home Application for Resident Activity Prediction

Rakshith M D1, Dr.Harish H, Dr.Thyagaraju G S3
[1]Department of CSESDMIT,Ujire GIT,Belagavi SDMIT,Ujire
Kenchannavar2 Department of CSESDMIT,Ujire GIT,Belagavi
Department of CSE SDMIT,Ujire GIT,Belagavi SDMIT,UjireSDMIT,Ujire

A B S T R A C T

Predicting resident activity in smart home has become an emerging research trend in the field of Pervasive computing. Resident activity prediction by using contextual data in smart home provides a resident intended service thereby makes him more flexible. In this paper, an effort has been made to achieve resident activity prediction by developing an android based smart home application which takes the following contextual parameters: resident id, location & status of the devices as input and predicts the activity of the resident as the output. The proposed smart home application involves the following steps: 1) Constructing the training dataset with the contextual parameters such as resident id, location & status of the device 2) Storing the captured data in SQL database 3) Retrieving the activity from the database by using Python programming. This can be achieved by using the Bluetooth module that communicates between the Raspberry Pi & mobile.

Keywords resident, activity, prediction, context, python

INTRODUCTION

The smart home improves the quality of the resident‚s life by providing a comfortable, flexible and safe environment. Recently, resident intention prediction using contextual data has become an emerging research trend in the area of Pervasive Computing. The necessity of predicting resident activity in smart home is to recommend resident intended services. This can be achieved by using the contextual parameters of the resident like: resident id, location, activity & by tracing the status of the devices used by the resident in his daily life. For example: Consider a scenario in single resident smart home where the contextual parameters of the resident along with the assumed values are as follows: resident-id: 123, location: living room, activity: reading & status of the device i.e. light=ON. Similar to this scenario various other contextual situations can be captured by employing sensors like RFID, GPS & activity sensors. The most important step in predicting the resident activity in smart home is to apply appropriate machine learning techniques on the contextual data in order to 1) Learn the behavioral patterns 2) To train & test the smart home datasets. The machine learning techniques used widely for predicting the resident activity in smart home are as follows: Cluster based K-means algorithm, EM-algorithm, SOM algorithm, Hidden Markov Model (HMM), C4.5 classifier, Back Propagation Neural Network (BPNN), Parallel computing, Batch Back Propagation (BBP), Levenberg Marquardt (LM) & Quick Propagation (QP), Formal Concept Analysis (FCA), Root-mean-square deviation (RMSD), DBN-ANN, DBN-R, Contrastive divergence, Non-linear Singular Value Decomposition (SVD), N gram, Bootstrapping based online learning.

In this paper, an android based smart home application to predict resident activity has been proposed which takes into account context history as the source of input and predicts the activity of the resident. The contextual parameters used for prediction are: resident id, location, activity & status of the devices embedded in smart home. The proposed smart home application involves the following steps: 1) Constructing the training dataset with the contextual parameters such as resident id, location & status of

of the device 2) Storing the captured data in SQL database 3) Retrieving the activity from the database by using Python programming.

LITERATURE SURVEY

Predicting resident activity in smart home has become an emerging research trend in recent years. Some of the algorithms proposed for achieving the resident activity prediction in smart home are as follows:

Bouchard K, Ajroud A [1], proposed a new flexible 3D smart home infrastructure open source simulator called "SIMACT" which is developed using java programming language. The simulator includes the set of pre-recorded scenarios generated using the data extracted from clinical trials for testing the activity recognition algorithms.

Muhammad Raisul Alam, M. B. I. Reaz [2], proposed a sequence prediction via enhanced episode discovery (SPEED) algorithm to predict inhabitant activity in smart homes. It works by extracting episodes (the set of user activities) based on the states of smart home appliances. Finite order Markov model is used to arrange & process the extracted episodes. The next activity of the inhabitant is predicted by applying prediction by partial matching (PPM) algorithm. The experimental results reveal that the proposed SPEED algorithm achieves a prediction accuracy of 88.3% which is better when compared with Active LeZi, IPAM, C4.5 & LeZi Update algorithms.

Andrei Papliatseyeu, Oscar Mayora [3], proposed a positioning system that recognizes & predicts the activities of the mobile user. Fusion of three wireless positioning methods were employed which results in achieving high availability & accuracy.

Ming-Je Tsai, Chao-Lin Wu [4], proposed a context-aware framework for human behavior learning and prediction. The behavioral patterns were learned by discovering the contexts from resident''s real life data. The authors evaluated the proposed framework on two public datasets. Promising results were obtained during the experimental analysis.

Enamul Hoque, Robert F. Dickerson, Sarah M. Preum [5], proposed comprehensive anomaly detection system called Holmes for predicting user daily activities in home. It considers variability in daily activities. The activities were extracted during different contexts like specific days of the week, at different time periods such as per week, per month. The activities based on temporal, correlation & collective based features were learned by using the proposed system. It also reduces false alarms by learning semantic rules that describes variations of activities during specific situations. The evaluation results illustrated that the Holmes system reduces false positives by 46% & false negatives by 27% compared to the other state of the art prediction systems.

Zong-Hong Wu, Alan Liu [6], proposed a method of leveraging multiple models. The activity which will happen in future is predicted by building a model using Bayesian network. Property filtering is applied to the obtained predicted results to get the final result. To learn conditional probability of resident activities from the CASAS datasets the Bayesian network model is used. Experimental results reveal that the proposed method provides improved accuracy & coverage in prediction of the activity.

Hapugahage Thilak Chaminda, Vitaly Klyuev [7], proposed a Smart Reminder System for reminding forgotten complex activities, in home environment. The authors focus on subjected complex

activities that should be completed after they are initiated & they consider those activities as "Coupling Activities". According to the user"s current behavior, current location & past activity patterns the reminders for forgotten coupling activities are predicted. The user"s context is identified by using wearable sensors. The proposed reminder system learns the dynamic behavior of the user & also predicts the reason for forgetting the most necessary activities with user"s minimum supervision. The experimental results reveal that the proposed system achieves average accuracy rate of 80% for reminder prediction.

Chao-Lin Wu, Yi-Show Tseng [8],proposed an approach that uses semi supervised learning to adapt activity recognition (AR) model. More useful representative activity instances are discovered by combining both temporal & spatial features.
The effectiveness of the proposed approach was demonstrated by experimental results.

Ehsan Nazerfard, Diane J. Cook [9],proposed an activity prediction approach called CRAFFT that uses Bayesian networks. To predict the next activity features & to predict next activity label a novel two-step inference process is employed. By using the outlier detection & continuous normal distribution the start time of the next activity is modeled by which prediction of the next activity is achieved. Using real data collected from two smart home apartments the proposed model was evaluated.

Chao-Lin Wu, Mao-Yung Weng [10],proposed hierarchical generalized context inference approach to infer the contexts of multiple users. The proposed approach generalizes multiple user contexts. It also dynamically infers & aggregates those contexts with different information granularity. The inference results reveal that the appropriate service was provided by a context-aware smart home. The effectiveness of the proposed approach was demonstrated by the experimental results.

DESIGN OF THE PROPOSED SYSTEM
System design provides a transition from users view to programmers view. It also acts as a bridge between the required specification and implementation phase. The architecture of the proposed system is shown below: It comprises of following hardware & software components using which the activity of the resident is predicted in smart home: 1) Raspberry pi 2) Smart phone 3) Bluetooth module 4) SQL database.
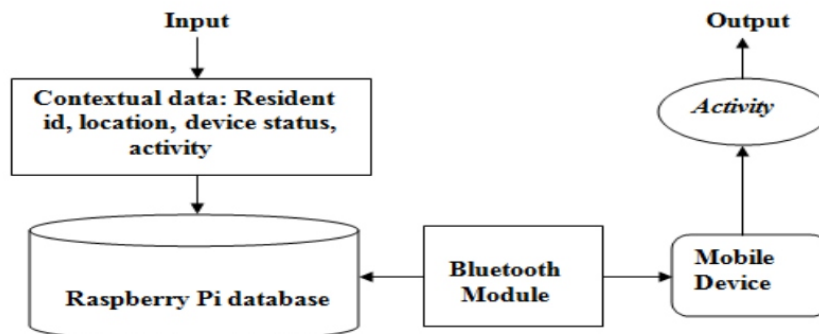

Fig.1 Architecture of the proposed system

EXPERIMENTAL SETUP

The experimental setup of the proposed system is depicted in the below snapshots:

Fig.2 Bluetooth module acting as interface between Raspberry Pi & mobile

Fig.3 Bluetooth signal retrieves the corresponding activity from database

IMPLEMENTATION

A. Procedure for implementing the proposed system

The proposed system is implemented by using the following steps:

Construct the training dataset with the contextual parameters

Store the dataset in Raspberry Pi by creating the database with the following attributes: 1) Resident-id 2) location 3) Status of the device 4) Activity

Start the smart home application in mobile

Enter RID, location & status of the device

Retrieve the corresponding activity by executing the python script. Bluetooth module is used to communicate between Raspberry pi & mobile device.

B. Dataset used for implementing the proposed system

The sample dataset considered for predicting the resident activity in smart home is depicted in the below table:

Table I Testing Datasets

Sl.No	Resident id	Location	Device status	Activity
1	112	Living Room(LR)	Light=ON	Reading
2	112	Living Room(LR)	Light=OFF	Sleeping
3	112	Kitchen(KN)	CF=ON	Cooking
4	112	Kitchen(KN)	CF=OFF	Drinking

C. Pseudo code used for implementing the proposed system

Step 1: Importing python library files
    import common gateway interface header file
    import common gateway interface trace back header file
    import MySQL database header file
    import system specific parameter and function header file

Step 2: Retrieving values from android application which is entered by user
    allocate space for the user inputs
    get value of person id from user and store it in variable var
    get value of location id from user and store it in variable loc
    get status of the device and store it in variable status

Step 3: Connecting to mysql database
    con <- MySQLdb.connect("127.0.0.1", "root", "tech123", "actiondatadb")
    establish localhost database connection and store it in the variable con
    where 127.0.0.1 local host ip address
    root is a username
    tech123 is password
    actiondatadb is database name

Step 4: Query which retrieves the specific information from database according to user input
    locate current position of database and store it in the variable curs
    execute mysql query

Step 5: Execute query to retrieve information from database
select databasename td_action from table training data

RESULTS & SNAPSHOTS
The proposed smart home application prompts the user to enter the values of the three contextual parameters i.e. 1) Person Id/Resident Id 2) Location of the resident 3) Status of the device as shown in the figure 4. After entering the values the user must click on Get Result button to obtain the activity of the resident as shown in the figure 5. The contextual parameter values are Resident id: 112, Location: Living room (LR), status of the device: light=ON& predicted activity: Reading. The results obtained from the proposed smart home application to predict resident activity are as follows:
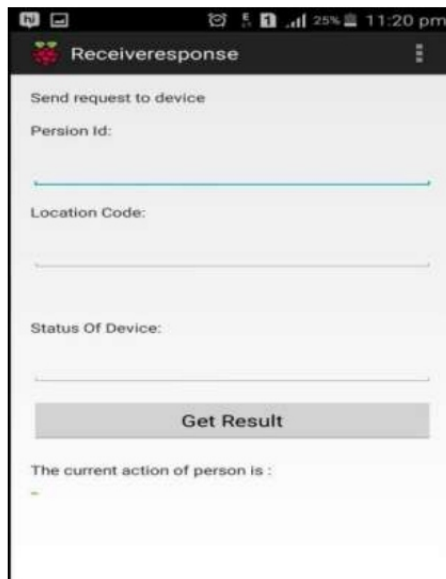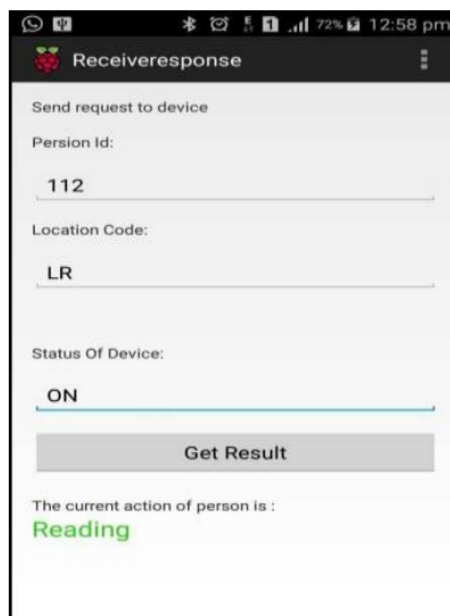
Fig. 4 User Input Page

Fig.5 Current activity of the resident

CONCLUSION

Prediction of resident activity in smart home has become a challenging task in the field of artificial intelligence. The proposed system involves an android based smart home application that predicts the resident activity by considering the contextual parameters like: resident-id, location & status of the device. The resident activity in smart home can be achieved by using the following steps: 1) Constructing the training dataset with the contextual parameters such as resident id, location & status of the device 2) Storing the captured data in SQL database 3) Retrieving the activity from the database by using Python programming. In retrieving the resident activity Bluetooth module plays a very important role by sending the signal to the database & it also acts as communication link between Raspberry Pi & Mobile phone. Prediction of multi-user activity in smart home by using machine learning algorithms will be considered as future work.

REFERENCES

1. K Bouchard, A Ajroud, A Bouzouane, "SIMACT: A 3D Open Source Smart Home Simulator for Activity Recognition with Open Database and Visual Editor", 2012, International Journal of Hybrid Information Technology, Vol. 5, No. 3, Canada.

2. M.R Alam, R.M.Beaz, M.A Mohd Ali, "SPEED: An Inhabitant Activity Prediction Algorithm for Smart Homes", 2011, IEEE Trans. Syst. Man Cybern. Part A Syst. Hum, Vol.4, pp.985–990, Malaysia.

3. Andrei Papliatseyeu, Oscar Mayora, "Mobile Habits: Inferring and predicting user activities with a location-aware smart phone", 2008, 3rd Symposium of Ubiquitous Computing and Ambient Intelligence (2008). Advances in Soft Computing, Vol. 51. Springer, Berlin, Heidelberg.

4. Ming-Je Tsai, Chao-Lin Wu, "Context aware Activity Prediction using Human Behavior Pattern in Real Smart Home Environments", 2016, IEEE International Conference on Automation Science and Engineering (CASE) Fort Worth, TX, USA, August 21-24, pp.168-173.

5. E Hoque , R F Dickerson, S M Preum, M Hanson, A Barth and J. A. Stankovic, "Holmes: A comprehensive anomaly detection system for daily inhome activities", 2015, International Conference on Distributed Computing in Sensor Systems (DCOSS), pp. 40-51, USA.

6. L. Gao, A. Bourke, and J. Nelson, "A comparison of classifiers for activityrecognition using multiple accelerometer-based sensors", 2012,IEEE 11th International Conference on Cybernetic Intelligent Systems (CIS), pp.149-153, 2012, DOI: 10.1109/CIS.2013.6782169, Ireland.

7. Hapugahage Thilak Chaminda, Vitaly Klyuev, "A Smart Reminder System for Complex Human Activities", 2012, 14th International Conference on Advanced Communication Technology(ICACT), February 19-22, pp.235-240, Japan.

8. Chao-Lin Wu, Mao-Yung Weng, "Hierarchical Generalized Context Inference for Context-aware Smart Homes", 2012, IEEE/RSJ International Conference on Intelligent Robots and Systems, October 7-12, pp.5227-5232, Vilamoura, Algarve, Portugal.

9. [9] E. Nazerfard and D. Cook. "Using Bayesian networks for daily activity prediction" in Proceedings of the AAAI Workshop on Plan, Activity andIntent Recognition Workshop, 2013, USA.

10. Chao-Lin Wu, Yi-Show Tseng, "Spatio-Temporal Feature Enhanced Semi-supervised Adaptation for Activity Recognition in IoT-based Context-aware Smart Homes", 2013,IEEE International Conference on Green Computing and Communications and IEEE Internet of Things and IEEE Cyber,Physical and Social Computing, pp.460-468, Taiwan.

11. N. Krishnan and D. Cook. "Activity recognition on streaming sensor data",2012, Pervasive and Mobile Computing, vol.20, pp.138-154, USA.

12. D. Cook, N. Krishnan, and P. Rashidi, "Activity discovery and activity recognition： A new partnership," 2013, IEEE Transactions on Systems, Man,and Cybernetics, Part B, vol.43, pp. 820-828, USA.

13. Diane J. Cook, and Narayanan C. Krishnan, "Activity Learning:Discovering, Recognizing, and Predicting Human Behavior from Sensor Data",2015, New York, NY, USA: Wiley.

14. Chia-Hung Chen, Alan Liu, and Pei Chuan Zhou, "Controlling a Service Robot in a Smart Home with Behavior Planning and Learning", 2014, Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics, 2014, Taiwan.

15. A Reiss, D Stricker, "Introducing a new benchmarked dataset for activity monitoring," Proceedings of the IEEE 16th International Symposium on Wearable Computers (ISWC), 18–22; pp. 108–109, June 2012, Newcastle, UK.

16. H Sagha, S.T Digumarti, J.D.R Millán, R Chavarriaga, A Calatroni, G Tröster "Benchmarking classification techniques using the opportunity human activity dataset," In Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics, Anchorage, AK, USA, 9–12 October

2011; IEEE: Anchorage, AK, USA, 2011; pp. 36–40.

17. P.Rashidi, DJ Cook, LB Holder, M Schmitter-Edgecombe, "Discovering activities to recognize and track in a smart environment,".IEEE Trans Knowl Data Eng 23(4):pp.527–539, USA

Instructions for Authors

Essentials for Publishing in this Journal

1 Submitted articles should not have been previously published or be currently under consideration for publication elsewhere.

2 Conference papers may only be submitted if the paper has been completely re-written (taken to mean more than 50%) and the author has cleared any necessary permission with the copyright owner if it has been previously copyrighted.

3 All our articles are refereed through a double-blind process.

4 All authors must declare they have read and agreed to the content of the submitted article and must sign a declaration correspond to the originality of the article.

Submission Process

All articles for this journal must be submitted using our online submissions system. http://enrichedpub.com/ . Please use the Submit Your Article link in the Author Service area.

Manuscript Guidelines

The instructions to authors about the article preparation for publication in the Manuscripts are submitted online, through the e-Ur (Electronic editing) system, developed by **Enriched Publications Pvt. Ltd**. The article should contain the abstract with keywords, introduction, body, conclusion, references and the summary in English language (without heading and subheading enumeration). The article length should not exceed 16 pages of A4 paper format.

Title

The title should be informative. It is in both Journal's and author's best interest to use terms suitable. For indexing and word search. If there are no such terms in the title, the author is strongly advised to add a subtitle. The title should be given in English as well. The titles precede the abstract and the summary in an appropriate language.

Letterhead Title

The letterhead title is given at a top of each page for easier identification of article copies in an Electronic form in particular. It contains the author's surname and first name initial .article title, journal title and collation (year, volume, and issue, first and last page). The journal and article titles can be given in a shortened form.

Author's Name

Full name(s) of author(s) should be used. It is advisable to give the middle initial. Names are given in their original form.

Contact Details

The postal address or the e-mail address of the author (usually of the first one if there are more Authors) is given in the footnote at the bottom of the first page.

Type of Articles

Classification of articles is a duty of the editorial staff and is of special importance. Referees and the members of the editorial staff, or section editors, can propose a category, but the editor-in-chief has the sole responsibility for their classification. Journal articles are classified as follows:

Scientific articles:

1. Original scientific paper (giving the previously unpublished results of the author's own research based on management methods).

2. Survey paper (giving an original, detailed and critical view of a research problem or an area to which the author has made a contribution visible through his self-citation);

3. Short or preliminary communication (original management paper of full format but of a smaller extent or of a preliminary character);

4. Scientific critique or forum (discussion on a particular scientific topic, based exclusively on management argumentation) and commentaries. Exceptionally, in particular areas, a scientific paper in the Journal can be in a form of a monograph or a critical edition of scientific data (historical, archival, lexicographic, bibliographic, data survey, etc.) which were unknown or hardly accessible for scientific research.

Professional articles:

1. Professional paper (contribution offering experience useful for improvement of professional practice but not necessarily based on scientific methods);

2. Informative contribution (editorial, commentary, etc.);

3. Review (of a book, software, case study, scientific event, etc.)

Language

The article should be in English. The grammar and style of the article should be of good quality. The systematized text should be without abbreviations (except standard ones). All measurements must be in SI units. The sequence of formulae is denoted in Arabic numerals in parentheses on the right-hand side.

Abstract and Summary

An abstract is a concise informative presentation of the article content for fast and accurate Evaluation of its relevance. It is both in the Editorial Office's and the author's best interest for an abstract to contain terms often used for indexing and article search. The abstract describes the purpose of the study and the methods, outlines the findings and state the conclusions. A 100- to 250- Word abstract should be placed between the title and the keywords with the body text to follow. Besides an abstract are advised to have a summary in English, at the end of the article, after the Reference list. The summary should be structured and long up to 1/10 of the article length (it is more extensive than the abstract).

Keywords

Keywords are terms or phrases showing adequately the article content for indexing and search purposes. They should be allocated heaving in mind widely accepted international sources (index, dictionary or thesaurus), such as the Web of Science keyword list for science in general. The higher their usage frequency is the better. Up to 10 keywords immediately follow the abstract and the summary, in respective languages.

Acknowledgements

The name and the number of the project or programmed within which the article was realized is given in a separate note at the bottom of the first page together with the name of the institution which financially supported the project or programmed.

Tables and Illustrations

All the captions should be in the original language as well as in English, together with the texts in illustrations if possible. Tables are typed in the same style as the text and are denoted by numerals at the top. Photographs and drawings, placed appropriately in the text, should be clear, precise and suitable for reproduction. Drawings should be created in Word or Corel.

Citation in the Text

Citation in the text must be uniform. When citing references in the text, use the reference number set in square brackets from the Reference list at the end of the article.

Footnotes

Footnotes are given at the bottom of the page with the text they refer to. They can contain less relevant details, additional explanations or used sources (e.g. scientific material, manuals). They cannot replace the cited literature.

The article should be accompanied with a cover letter with the information about the author(s): surname, middle initial, first name, and citizen personal number, rank, title, e-mail address, and affiliation address, home address including municipality, phone number in the office and at home (or a mobile phone number). The cover letter should state the type of the article and tell which illustrations are original and which are not.

Note