International Journal of Engineering Research-Online
A Peer Reviewed International Journal
Articles available online http://www.ijoer.in

Vol.3., Issue.3, 2015

REVIEW ARTICLE

ISSN: 2321-7758

HOME AUTOMATION SYSTEM PROCESSING

MIRUNALINIE.S[3], Dr.S. UMA[2], DURGA DEVI.R[3], KRISHNA PRIYA.V[3]

[1]PG Scholar,PG CSE Department,Hindusthan Institute of technology, TamilNadu,India.
[2]Head Of The Department,PG CSE Department, Hindusthan Institute of Technology,TamilNadu,India.
[3]PG Scholar,PG CSE Department,Hindusthan Institute of Technology,TamilNadu,India.
[3]PG Scholar,PG CSE Department,Hindusthan Institute of Technology, TamilNadu,India.

Article Received:07/05/2015 | Article Revised on:15/05/2015 | Article Accepted on:20/05/2015

MIRUNALINIE.S

ABSTRACT

The wireless sensing element networks are wide utilized in automation to offers numerous benefits and new challenges. The house automation system plays a vital role in maintaining living standards and supply secure and versatile atmosphere. The aim of this project is to style a home automation system that makes operative of electrical appliances in home through golem application. The house automation system permits dominant of home appliances by victimization voice commands by recognizing the input speech. The speech recognition is finished by Support Vector Machine. The house automation system is enforced wirelessly victimization General packet radio service (GPRS) technology. The electrical appliances like fan, lightweight switches, lightweight sensors, current sensors are integrated in a very system that then connected to microcontroller that act as an among the house to manage and perform the user commands. Every WAP request is employed just one occasion to forestall replay attacks. Through wireless communications can step by step penetrate into the globe shut USA and convey nice changes to our daily modus vivendi.The projected sensible power trying and dominant code has the feature of interacting with the appliances remotely through net (website). This enables user to own versatile management mechanism remotely through a secured net web affiliation. This usually are often an enormous facilitate to the user United Nations agency has the habit of keeping the appliances ON get through from house. The user will monitor the condition of all appliances and do the specified

INTRODUCTION

The aim of the planned work is to gift a security integrated system, supported the WAP framework for remote observance and management of home appliances. User will gain access to the system through WAP enabled. ECAs are used as virtual assistants that create easier the access to data or facilitate in playacting advanced tasks. As a result of their high procedure needs ECAs are typically run on desktop computers, however with the recent development offhand-held devices each in hardware and code, it becomes necessary to maneuver ECAs to it new mobile state of affairs. Thus, we have a tendency to propose associate ASCII text file primarily {based} platform for developing ECA based interfaces on Android-equipped devices. We have a

tendency to additionally gift an image for dominant a home automation system.

Wireless detector networks unit of measurement giant demand in mobile apps. In Past decade Wireless detector Networks (WSNs) become attention in each country. The appliance of WSN detector is to localize the oldsters or devices in varied surrounding's. As a result major gap between existing wireless sensors and medical trying. Most of the wireless sensors unit of measurement meant to deploy the stationary nodes that transmit data with low rate. The wireless detector networks unit of measurement utilized in home automation to transmit data with low transmission rates and to manage the house appliances. The house automation system improves the living standards and additionally helps the older folks. The ability to manage the electrical home appliances not alone from one location however throughout the country is often a promise of home decades. . The wall switches placed in several parts of the house makes the user tough to travel close to them to work. Even it becomes more durable for the older and physically unfit folks. GPRS technology is advancing the house automation system are becoming the smarter technology. Homes unit of measurement shifting from switches to centralized system that involves wirelessly controlled switches. Real time based mostly wholly remote home automation system provides a neater answer with mechanical man application technology. Mechanical men are often a code stack for mobile devices. And it consists of properties, additionally as Wi-Fi, Bluetooth, and wireless data over a cellular network. Android Provides access to a wide vary of helpful libraries and tools which can be used to build loaded applications. Additionally, mechanical man includes a full set of tools that offers the developers with high productivity and deep insight into their applications. Remote operation is achieved by any smart-phone/Tablet etc., with mechanical man OS, upon a graphical program (Graphical User Interface) based mostly wholly bit screen operation. Thus on attain this, mechanical man application act as transmitter that sends ON/OFF commands to net server wherever a full heap unit of measurement connected as shown in Figure.1. By operational the specified remote activate the transmitter, a full heap is additionally turned ON/OFF remotely through wireless technology. Wireless communication based mostly wholly home automation quality and maintenance compared to wired devices.

Methodology:

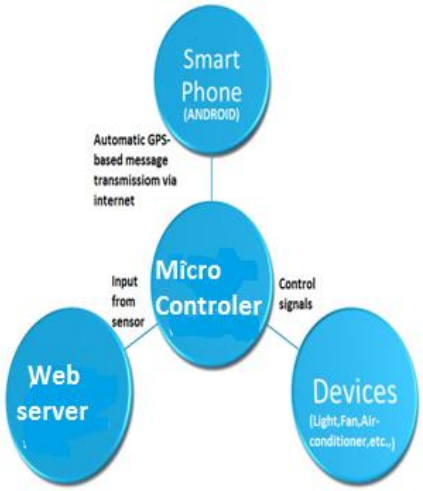

Fig.1. Home automation system processing

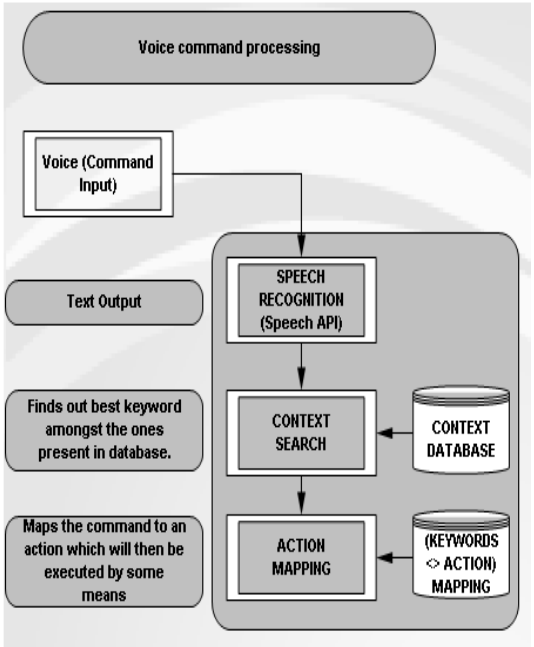

Fig.2. Speech recognition using keyword mapping

Radio frequency:

While providing a brand new category of wireless services, cyber-enabled device observance and management also imposes new capability demand on wireless networks. this {can be} as a result of that: not like wired networks wherever new requests on communication services can for the most part be resolved by adding additional transmission lines, in wireless networks, the entire accessible spectrum is principally restricted by the frequency (RF) technologies, and must be shared by

numerous users and services at every power outlined zone or cell. Once the system is full, network performance and liableness would be lost or greatly degraded. So as to accommodate additional users with security sensitive service requests, to be way more economical, and at a similar time, be way more secure and reliable.

Frequency multiplexing divisions:

Orthogonal frequency division multiplexing (OFDM) is far and away the foremost economical modulation scheme, and is anticipated to be used wide for reliable two-way communications in sensible Grid and sensible Home. The essential principle of OFDM is to separate a high-rate knowledge stream into variety of lower rate streams that are transmitted at the same time over variety of orthogonal subcarriers. OFDM will effectively eliminate the inter symbol interference (ISI) caused by the multipath propagation and deliver the goods high spectral potency. By distribution subsets of subcarriers to individual users, we have a tendency to then get a multi-user version of OFDM, called orthogonal frequency division multiple accesses. OFDMA has emerged joined of the prime multiple access schemes for broadband wireless networks. However, OFDMA doesn't possess any inherent safety features and is fragile to hostile ECM and interception.

Space-time writing:

The anti-jamming property of the OFDMA based mostly CFFH is more increased by incorporating frame of reference writing (STC) [6] that could be a technique that exploits house diversity by sending totally different versions of a similar signal through multiple antennas. once there are NGO transmission antennas and NR receiving antennas, then the system capability is accrued linearly by an element of min. once incorporated with OFDM, the space time diversity in frame of reference writing is then reborn to space-frequency diversity. The mixture of frame of reference writing and CFFH is especially powerful in eliminating channel interference and hostile ECM.

Design of the Application:

People aren't needed to understand the schema prior to. Consistent with the request sent by the shopper, the server method the information and it's capable the shopper, that is more received by the assistance of open knowledge Input Stream in HTTP affiliation Object. That the app of shopper is meant consistence with the sector data of the tables retrieved from the server. We might be victimization alternative cluster Object for coming up with Radio Buttons, Check Boxes and Dropdown list boxes.

User Viewer Module:

The client-side system could be a MIDlet application that is AN interface to enclose the contents and management directions that is taken on the server and therefore the acceptable action is been tokened. The news creation task is finished through an information entry interface that contains numerous sections to be crammed. Once done the information is uploaded to the server and hold on within the info server.

The media news capture is that the most vital section of the MIDlet apps. And it is the options to capture videos for the devices that support it. These media will then be uploaded to the server and hold on in a very explicit directory structure.

Server connecting:

This server connecting module is employed for connecting the server to the mobile shopper victimization Stream Socket affiliation. For the affiliation the remote desktop IP address is given within the mobile so connected. Jar file is made victimization J2ME wireless toolkit & put in into the mobile phone through the USB port

Web crawl:

An internet crawler could be a Trojan horse that browses the planet Wide Web in a very organized, machine-driven manner or in AN orderly fashion. This method is named internet crawl or spidering. Many sites, above all search engines, use spidering as a method of providing up-to-date knowledge. Internet crawlers are chiefly wont to produce a replica of all the visited pages for later process by an enquiry engine that may index the downloaded pages to supply quick searches. Crawlers may also be used for automating maintenance tasks on an internet website, like checking links or substantiating Hyper Text Markup Language coding. And crawlers also wont to specific gather sorts of data from web content, like harvest e-mail addresses. During this paper, we have a tendency to use a vertical crawler to crawler the video sites. Internet crawler is one among the foremost indispensable modules for the collectors of special data.

Address discovery Module:

In coming up with the address discovery module, we have a tendency to propose a plug-in based mostly address discovery platform. a particular address discovery plug-in is meant for every video web site. The measurability of the platform is nice and every plug-in is de-coupled. Parsing and address discovery module is liable for parsing HTML pages like the uniform resource locator that contains video resources, and finds out the $64000 address of the video. Through putting in place HTTP Proxy server between parsing server and video server, this module will simply catch the HTTP Response packets that contain the $64000 address of the videos. As most video websites have their own proprietary video segmentation strategy, for various websites, we have a tendency to style a feature-based call tree approach to see the $64000 address of videos.

Task observance and programing Module: Task observance module is liable for reading transfer standing of every task within the queue, and causing it to the front-end show interface that could be a browser. The browser dynamically refreshes the task standing victimization mythical being technology. Task programing module is liable for the maintaining the task standing within the queue, victimization of producer/consumer programing model.

Video capturing:

Digital video refers to the capturing, manipulation, and storage of moving pictures that may be displaced on pc screens. First, a camera and a electro-acoustic transducer capture the image and sound of a video session and send analog signals to a video-capture adapter board.

RELATED analysis

The home automation system is intended mistreatment varied technologies like Bluetooth, Zigbee, Internet, short message service (SMS) primarily based. These latest technologies offer user friendly home automation system with low value. The capabilities of Bluetooth square measure smart and current cell phones, laptop, and tablets have built-in-adapter which will indirectly scale back the price of the system. But it limits the management to among the Bluetooth vary of the setting. Zigbee primarily based home automation systems square measure used. Zigbee in home automation reduces the price of wiring and supply reliable and secure communication. The first sensing element networks were used with Routing Algorithms and RF technologies. The recent systems are mistreatment standard-based algorithms and RF solutions. ZigBee is taken into account as an occasional rate wireless network normal with additional options like inexpensive, low power consumption and quick reaction and it's best suited for little space networks.

WIFI home automation system uses computer based net server that connects the house devices. The system conjointly supports a good vary of home automation devices like power management systems, and security systems .The drawback is that several devices can got to be connected to power sources, and therein some devices like machine-driven power shops and would like sufficient wattage sources.

There square measure some challenges in coming up with home automation mistreatment wireless sensing element networks (WSN. The house automation system is enforced mistreatment 3 different approaches: GPRS, Speech and web. The GPRS technology won't to management the signals while not limiting its varying. Speech is employed to method the precise user commands to perform completely different shift and management systems by giving the voice signals. A major contribution to home automation system is be created by mistreatment the on top of mentioned systems. The remotely accessible home automation system is created by mistreatment information, web server, speech recognition program and management program. The computer is employed as a server that reduces and power consumption whereas others need website hosting that adds up the additional cost. The voice recognition systems either use computer package or separate voice recognition module for speech recognition. In projected home automation system the speech are recognized mistreatment Support Vector Machine (SVM) classifier and activity detection by mistreatment keyword matching algorithm. The voice systems consist of many cameras and microphones. There's a haul in distinguishing distance speech in multiparty conferences. It is resolved mistreatment spatial Filtering techniques and microform be forming arraying techniques. A lot of recently audio technologies were wont to improve the performance of home automation system, but the

aim is quality of Audio. Audio technologies square measure designed with older peoples WHO square measure frail. They just accept this new technology and the performance of audio are tested with seven traditional persons WHO square measure between the age of sixty five and eighty years. Interviews were disbursed that is absolutely equipped with good home system the Gaussian mixture model is employed to classify the sound. Related to this analysis chase a vigorous speaker in littered environments. It is finished by employing a particle filter or info filter. During this technique it separates the noise signal from the first supply. Many algorithms square measure won't to differentiate between the verbalized noise and original sound.

Efficient speech recognition system should be simply able to observe one voice that belongs to original speaker and conjointly ready acknowledge once the voice changes from one person to a different. The speech stream is metameric into varied homogenized regions that acknowledge the characteristics of individual persons. The segmentation techniques depend on the length of the speech. Various models square measure used to explain the precise characteristics like live information streams, conversations, conferences however they're troublesome to get the performance by testing the house automation serve ices is intended with predefined sound categories .the sound categories like human speech, bell ringing, sound square measure keep in a very information that then accessed to perform a selected actions. This methodology adopts the house automation system that acknowledges the precise sound and obtains the nice results by performing arts the user actions actively. The performance was evaluated mistreatment the important recorded information within the three.2m*4.2 rooms. The table one shows the comparison of wireless technologies.

System design

The summary of a home automation is shown. The system consists of Associate in nursing automaton developed application that controls the home appliances. The system consists of the PIC controller within which electrical appliances are directly interfaced to the microcontroller. The automation system of home is monitored and controlled from the remote location victimization automaton sensible Phone. The automaton phone communicates with the net server through net and sends the signal to the microcontroller that acts as hub within the home automation system. Any net connections 3G network or 4G is used on the used sensible phone device. The options of home automation includes

- Controlling energy management devices.
- Voice activation is employed for change functions.
- Provides security by having user authentication to accesses devices

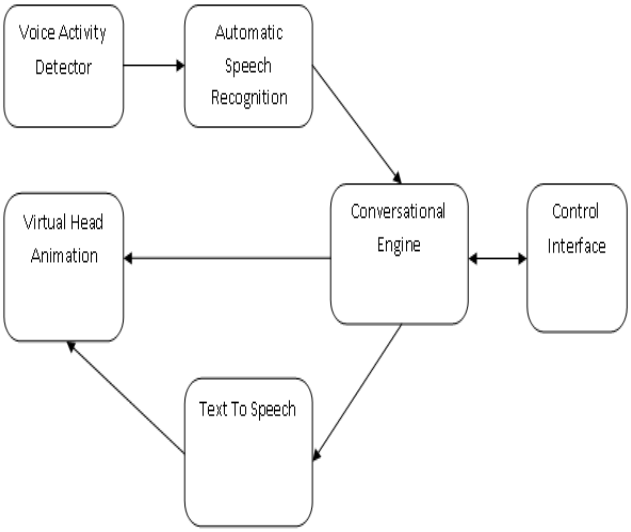

Fig.3. summary of home automation system

Software development of automaton application

The sensible applications is developed victimization many platforms like automaton, Windows, Symbion, iPhone. The appliance for home automation system is developed in automaton phone. Java artificial language with SDK (Software development kit) is employed to develop the applications. SDK that permits making the applications sure of a software system package, software system framework, hardware platform and computing system or similar development platforms. Eclipse that runs on Windows seven platform formally supports integrated development atmosphere (IDE) that is employed as conjunction with ADT (Android Development Tools).

The home automation system provides the subsequent functionalities to the user:

1. Remote association through net to the net server.
2. Provides information science and user authentication.

3. Dominant and observation of home appliances.
4. Programming tasks and to regulate of the house automation system.
5. Parole modification choice.
6. Provides voice activation for change functions.

Wireless application Architecture Designing

WAP mechanism is intended to supply security for remotely accessing automation. The authentication is that the C-Mobile and therefore the SAG can share a secret key, k, which may be generated from a high security parole. The secure home management and control observation of home devices through wireless communications can bit by bit penetrate into the globe encompassing US and convey nice changes to daily modus vivendi. WAP permits users to simply access web-based data services and interactive applications with their mobile phones

Invoke RMI server

To invoke response from the remote users, continuous update of the server .The Fig four shows the RMI interface that consists of RMI register that invokes the strategy once the consumer sends missive of invitation. RMI technique communicates with the WAP protocol to interface with the net server.

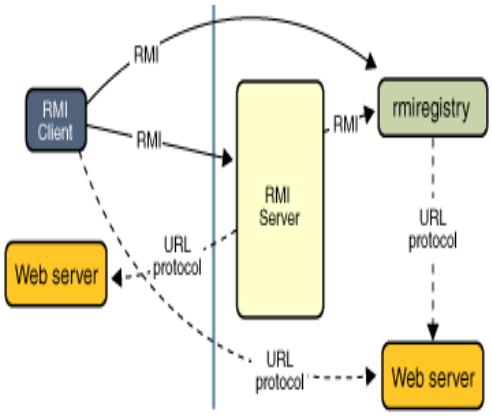

Fig.4. RMI interface

SOFTWARE DEVELOPMENT OF the house AUTOMATION internet SERVER

The web server is developed to attach the hardware devices and therefore the microcontroller and the automaton mobile application is connected to the web server. The web IP address is built in the app of the mobile application and the established connection is connected. APK file is formed victimizations J2ME wireless toolkit and put in into the automaton phone through the USB. The microcontroller with internet server is connected to the web through TCP/IP that acts as an each consumer and server for the house automation. The output message that sent to the automaton application is in JavaScript Object Notation (JSON) format. Through the HTTP settings the system will simply catch the commands from the important address. The information flowchart of home automation is shown to explain the overall process of the house automation system. The user enters the information science address and therefore the parole in automaton application. If a parole is valid it monitors the device standing and respond back to the user weather the particular device is ON/OFF as shown in Figure five. The device users send a voice command through automaton phone to the microcontroller that converts digital signals and transmits the signals to the net server. The net server makes a keyword search within the predefined information and performs the action. The server that is connected to the small controller performs the operation .Once the actions starts the sub-routine is termed and therefore the password is verified. If a parole is valid the authentication is provided and therefore the action is performed. When performing arts each action the output is distributed to the consumer. If a consumer makes missive of invitation to change a parole by clicking parole modification button then the new parole is modified within the memory and it's initialized.

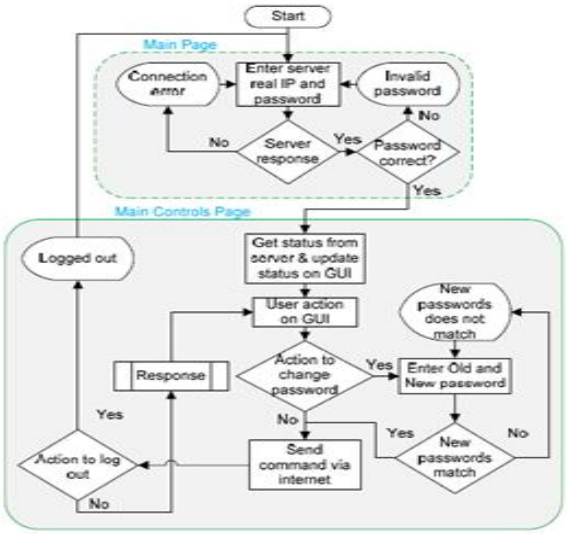

Fig.5. Processing of home automation system.

$	Password	$	Device	_	Action

Fig.6. General Layout of user command

ADDRESS DISCOVERY FOR internet SERVER

To with success connect and access the net server within the home automation system the user needs to enter the important information science address. If an internet server grant access to home automation system the command containing the response code is received. The automaton application method the command to see the net server's response. The code indicates that the information science address is correct and it switches to the small controller as shown in Figure half dozen. And synchronize victimization information from the command. If a parole is invalid the code 404 are going to be received. Once the accesses is granted the user will perform the action .by victimizations speech recognition engine change functions can even perform with voice activations. once the user performs the actions on home automation instruction send to the net server through the web. the overall command is shown in Figure seven. The command is intended in an exceedingly method such the net server will simply browse extract the command.

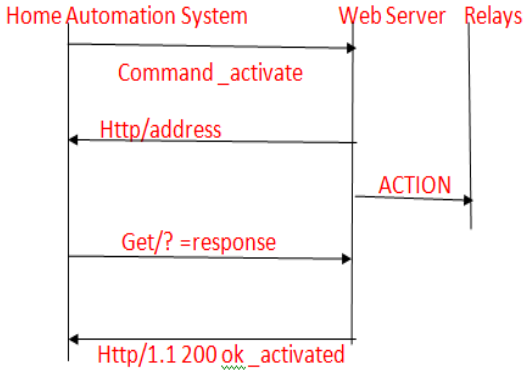

Fig.7. Exchange of message between automaton application and internet server to method the command.

MONITORING AND CONTROLING HOME AUTOMATION

The home automation system is controlled and monitored victimizations automaton application wirelessly. The user offers a voice command within the automaton application .The sensible phone send the command to the net server through net. The net server verifies the information science address and response back to the user as valid parole. The server send the command to the small controller, it converts analog signals to digital signals. SVM classifier extracts the first sources from the noises. The first supply is extracted victimizations background subtraction. The keyword matching algorithmic rule is performed. It matches the command with the pre-defined sets within the information. If a keyword is matched then the particular action is performed.

For example if a user offers a command to modify ON lightweight (Light ON) the command is processed and therefore the keyword (Light ON) is matched in information and therefore the action is performed. The most purpose of this project is:

1. Dominant home appliances wirelessly through mobile phones.
2. Usage of speech recognition application for performing arts the task.
3. Net primarily based wireless transmission victimizations automaton 3G network.

Mobile Device

Mobile device with automaton application gets the input from the user. User 1st connects to the central information through GPRS and so user provides the login data. when booming login user are going to be able to read the invoices.

GPRS module

GPRS module provides the property to the central information.

This home automation system offer the exposure to the subsequent technologies like victimization automaton open supply technology, Interfacing laptop to the Microcontroller, magnetic attraction Relays are used for change principles. The information transfer victimization GPRS from a mobile to laptop (Which act as a server).

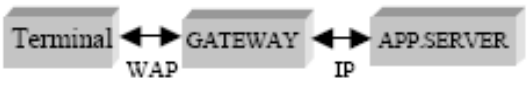

Fig.8: TCP/IP mingles with WAP

Hardware Infrastructure

The hardware containing the micro controller with home appliances, the micro controller is on with 9v power supply and the appliances needs separate power supplies. The controller is connected to the server via RS32 cable. The server starts we can control the devices of home appliances.

EXISTING SYSTEM

Smart net has been characterized as degree integrated system which is able to increase the efficiency, responsibility and suppleness of the electricity network through a two-way flow of electricity and information.

As the purchasers like better to tailor their energy consumptions in responding to value or environmental issues, the peak load burden area unit reduced, and therefore smart Grid can meet accumulated consumer demand whereas not adding expensive infrastructure.

An integration of the renewable energy sources will increase the power diversity, and shrink our dependence on fuel additionally as a result of the greenhouse gases.

LIMITATIONS

Energy consumption management mechanism is forbidden to entirely positive devices like light-weight illuminations, whereas several organization appliances potential to controlled

Energy management relies on mounted threshold power consumption, that can't be applicable to altogether completely different shoppers. Dominant the house appliances through network management functions, in follow somebody desires may vary in keeping with their behavior but not with network characteristics. Not one system has taken into thought of variable tariff of electricity that's consumed throughout day and night.

PROPOSED SYSTEM

Proposed System permits the patron for flexibility in dominant the devices: The users (inhabitants) have the alternatives of switch the device on/off in three alternative routes.

Mechanical control: supported the electricity tariff conditions, the appliance might be regulated with the help of pc code. This can be often accustomed saving additional value by motor vehicle flip the appliances throughout the peak hours. The tariff of electricity is proceed from the net website of the electricity give company and is updated at regular intervals.

Physical control: associate degree on/off switch is provided to directly intervene with the device. This feature permits the user to possess extra flexibility by having manual management on the appliance usage whereas not following management automatic. And, with the developed coding system for observance and dominant user interference, this feature has the higher priority to bypass the machine-driven management.

Isolated control: The smart power observance and dominant software system package has the feature of interacting with the appliances remotely through web (website). This allows user to possess versatile management mechanism remotely through a secured net internet affiliation. This usually could also be a colossal facilitate to the user administrative body has the habit of keeping the appliances ON whereas out of vary from home. The peoples want monitor the condition of all appliances and do the desired.

Thus, the user has the plasticity in dominant the electrical appliances through the developed epitome.

ADVANTAGES

The device networks are programmed with numerous user interfaces appropriate for users of various ability and for professional users specified the system could also be maintained simply and interacted with terribly merely.

The developed system is powerful and versatile operative. The system was to perform the remote observance and management of appliances effectively. Native and remote user interfaces area unit simple to handle by a novice consumer and area unit economical in handling the operations. Counting on the usages of appliances controlled by smart phone sense units area unit controlled either by automation supported the tariff conditions or by the somebody domestically victimization graphical computer program and remotely victimization the online website.

LITERATURE SURVEY

1) Humor and Embodied informal Agents

Anton Nijholt

Telemetric and knowledge Technology Centre

This report surveys the role of humor in human-to-human interaction and together the come-at-able role of humor in human-computer interaction. The aim is to seem at whether or not or not or not it's helpful for embodied informal agents to integrate humor capabilities in their internal model of intelligence, emotions and interaction (verbal and nonverbal) capabilities. A current state of the art of study in embodied informal agents, emotional computing and verbal and nonverbal interaction is conferred.

2) Association Automatic Intelligence TV interface supported arithmetic Dialogue Management
IEEE Transactions on consumer scientific discipline, Vol. 53, No. 4, Nov 2007
In this paper, we tend to tend to tend to propose makings intelligent TV interface employing a voice-enable dialogue system. This paper rests on the each direction: a current kind of dialogue management model and its use for wise systems to commercialize. We tend to tend to tend to plot a sensible dialogue management model supported arithmetic learning ways in which to utilize mathematics learning techniques for anaphora resolution and discourse history management. Contrary to the rule-based system, we tend to tend to tend to develop makings progressive learning technique to construct dialogue ways from the use corpus.

3) Grounded Language Modeling for Automatic Speech Recognition of Sports Video archangel Fleischman
Massachusetts Institute of Technology
Media Laboratory mbf@mit.edu
This paper describes however they're learned from massive corpora of unlabelled video, and unit of measuring applied to the task of automatic speech recognition of amusement video. Finally shows that the below language models improve confusion and word error rate over text based mostly whole language models, and extra, support video info retrieval quite human generated speech transcriptions.

4) 'How was your day?' makings emotional companion ECA epitome spirits Cavazza
School of Computing Teesside University
Middleborough TS1 3BA
This paper presents a dialogue system at intervals the kind of educational degree ECA that acts as a sociable and showing emotion intelligent companion. However the user talks relating to his/her day at the geographic point. Throughout conversations the system monitors the feeling of the user and uses that info to inform its dialogue turns. The system is ready to retort to spoken interruptions by the user.

CONCLUSION

The main goal of this work was to clarify a platform aimed toward developing ECA-based interfaces on hand-held devices equipped with automaton. Thus, we've a bent to project a come-at-able style and gave implementation details for such platform. The full platform is based on free and open provide libraries and a primary epitome was developed for dominant a home automation. For developing ECA based interfaces on Android-equipped devices. We've a bent to develop a epitome place in on a pill for dominant a home automation system. We've a bent to together gift associate epitome for dominant a home automation. As a result hand-held devices compared to desktop computers, the foremost common architectures for ECA-based mobile applications place confidence in Associate in nursing external server that performs the processor intensive tasks, like speech recognition, language understanding and text-to-speech.

REFERENCE

[1] L.M. Vaquero, L. Rodero-Merino, J. Caceres, and M. Lindner, "A Break in the Clouds: Towards a Cloud Definition," ACM SIGCOMM Comput. Commun. Rev., vol. 39, no. 1, pp. 50-55, 2009.

[2] N. Cao, S. Yu, Z. Yang, W. Lou, and Y. Hou, "LT Codes-Based Secure and Reliable Cloud Storage Service," Proc. IEEE INFOCOM, pp. 693-701, 2012..

[3] N. Cao, C. Wang, M. Li, K. Ren, and W. Lou, "Privacy-Preserving Multi-Keyword Ranked Search over Encrypted Cloud Data," Proc. IEEE INFOCOM, pp. 829-837, Apr, 2011

[4] Ning Cao,, Cong Wang, Ming Li, Kui Ren, Wenjing Lou," Privacy-Preserving Multi-Keyword Ranked Search over Encrypted Cloud Data" IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS, VOL. 25, NO. 1, JANUARY 2014

[5] Ankatha Samuyelu Raja Vasanthi ," Secured Multi keyword Ranked Search over Encrypted Cloud Data", 2012

[6] Jain Wang, Yan Zhao, Shuo Jaing, and Jaijin Le,"Providing Privacy Preserving in Cloud Computing", 2010.

[7] Y. Prasanna, Ramesh. "Efficient and Secure Multi-Keyword Search on Encrypted Cloud Data", 2012.Practice and Theory in Public Key Cryptography, pages 332–350, 2010.

[8] S. Kamara and K. Lauter, "Cryptographic Cloud Storage," *Proc 14th Int'l Conf.*

Financial Cryptograpy and Data Security, Jan 2010.

[9] Shiba Sampat Kale, Shivaji R Lahane, "Privacy Preserving Multi-Keyword Ranked Search with Anonymous ID Assignment over Encrypted Cloud Data" (IJCSIT) Vol. 5 (6) , 2014

[10] C. Wang, Q. Wang, K. Ren, and W. Lou, "Privacy-Preserving Public Auditing for Data Storage Security in Cloud Computing," Proc. IEEE INFOCOM,

[11] Y. Hwang and P. Lee, "Public Key Encryption with Conjunctive Keyword Search and Its Extension to a Multi-User System," Pairing, vol. 4575, pp. 2-22, 2007.

[12] C. Wang, N. Cao, J. Li, K. Ren, and W. Lou, "Secure RankedKeyword Search over Encrypted Cloud Data," Proc. IEEE 30th Int' lConf. Distributed Computing Systems (ICDCS '10), 2010.