



*International Journal Of*  
**Recent Scientific  
Research**

ISSN: 0976-3031  
Volume: 7(4) April -2016

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THE OFFICIAL PUBLICATION OF  
INTERNATIONAL JOURNAL OF RECENT SCIENTIFIC RESEARCH (IJRSR)  
<http://www.recentscientific.com/> [recentscientific@gmail.com](mailto:recentscientific@gmail.com)



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

International Journal of Recent Scientific Research  
Vol. 7, Issue, 4, pp. 9971-9973, April, 2016

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## Research Article

### ACCESSIBILITY OF DOMESTIC AREA NETWORK USING HANDHELD DEVICES

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#### ARTICLE INFO

##### Article History:

Received 06<sup>th</sup> January, 2015  
Received in revised form 14<sup>th</sup>  
February, 2016  
Accepted 23<sup>rd</sup> March, 2016  
Published online 28<sup>th</sup>  
April, 2016

##### Keywords:

Disaster, Disaster Response, Disaster  
Management, Ambulance Services

#### ABSTRACT

This paper is mainly focus on autonomy at home. It can be proposed by monitoring and controlling the status of temperature sensor, humidity controller, pressure sensor present in domestic area networks and also can able to reset the target system level by varying the time, temperature, and other environmental factors. It can operate the entire home appliances from any portion of the home. This pervasive, intelligent home is a luxury item for many people, could have a key role in assuring the autonomy of people. The concept of using different levels of screens containing icons representing the rooms, the appliances to be controlled and the commands was utilized in this work, but as it is intended to be universal, additional requirements were needed. The work was developed starting with an interface design proposal, based on the research on accessible interfaces state of the art. The interface was deployed targeting Tablets and Smart Phones interoperability. It was integrated to control a home gateway prototype. This research could consolidate a feasible interface to control home area networks pointing out the main requirements for home area networks considering a diversified group of impairments.

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#### INTRODUCTION

Embedded system contain processing cores that are typically either microcontroller or digital signal processor(DSP).The embedded system is a computer system designed for specific control function within a larger system, often with real-time computing constraints It is embedded as part of a complete device often including hardware and mechanical parts. By contrast, a general-purpose computer, such as a personal computer (PC), is designed to be flexible and to meet a wide range of end-user needs. Embedded system control many devices in common use today. Physically, embedded system range from portable devices such as digital watches and MP3 player, to large stationary installations like traffic light, factory controllers. Complexity varies from low, With a single microcontroller chip, to very high with multiple units ,peripherals and networks mounted inside a large chassis or enclosure. Many embedded system have substantially different design constraints than desktop computing application. Embedded system is typically a design making use of the power of a small microcontroller, like the Microchip PICmicro MCU or dsPIC Digital Signal Controller (DSCs). These microcontrollers combine a microprocessor unit (like the CPU in a desktop PC) with some additional circuits called "peripherals", plus some additional circuits on the same chip to

make a small control module requiring few other external devices. This single device can then be embedded into other electronic and mechanical devices for low-cost digital control.

#### LITERATURE SURVEY

Costa,P. *et al* (2012) described an approach for interconnecting home and mobile networks to enable the control of consumer electronics devices connected in a home network, from a remote mobile device like a mobile phone or a web pad. This profile encompasses a large number of potential applications, particularly in the appliance field. Index Terms Appliance dynamics, electronic appliance control, forced limit cycle, microprocessor controlled, self adapting, self tuning. Costa, P. and Almeida,S. (2013) exposed a novel home network system for creating new network and service architecture by connecting home appliances networked using Bluetooth technology with the Internet. Finally, show the implementation and evaluation results, and discuss the advantages of this system for white appliance networking.

Ghorbel, M. and Arab, F. (2008) proposed a home appliance control system over BluetoothTM1 with a cellular phone, which enables remote-control, fault-diagnosis and software-update for home appliances through Java applications on a cellular phone. . Given the constrained domain, define a simple set of actions that can be recognized based on the active

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contour shape and motion. The recognized actions provide an annotation of the sequence that can be used to access a condensed version of the talk from a Web page. Le,B. et al (2007) proposed an architecture for secure access to home or an organization's networks and control of networked appliances inside a home or within an organization from a remote location. Most commonly used communication tools such as cellular phones, landline telephone and email are considered for remote control of appliances by proposing efficient structures. All these control schemes are analysed for their performances suiting modern home automation and security demands.

Mainardi,E. (2008) explained design and implementation of intelligent power management devices using user location, user motion detection and user living patterns in home networks. iPMD which will be installed in every power outlet in a home, is made up of five blocks: the piezoelectric infrared (PIR) sensor circuit, the light sensor circuit, the microprocessor, the power meter with a LED display and the PLC module. iPMD detects if a human body enters the detection area or not. Sleman,A. and Alafandi,M. (2009) described a time synchronized forwarding protocol for remotely controlling home appliances connected to wireless sensor networks (WSNs) that have extremely large latency for transferring data to another node.

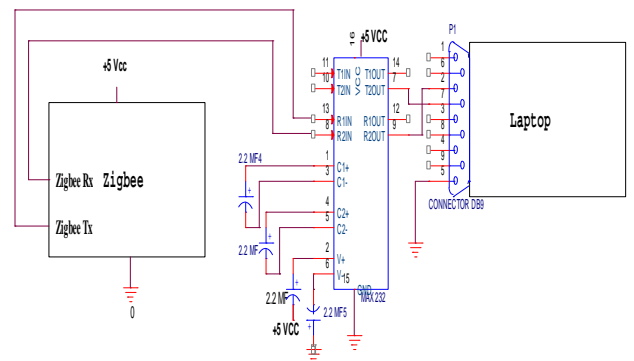
The Kull back information criterion (KIC) is a recently developed tool for statistical model selection. KIC serves as an asymptotically unbiased estimator of a variant (within a constant) of the Kull back symmetric divergence, known also as J-divergence between the generating model and the fitted candidate model. Xianmei,W. and Lingyan,L. (2010) described the problem of controlling the assistive home environment and emphasizes human-friendly human-machine interactions in an approach designed to achieve independence. International Network of Embedded System (INES) and the European Project Semester (EPS), where exchange students remotely perform the first phase of their projects at ETSID from their home universities. Zhu,J. et al (2010) proposed to Control the electric appliances is the essential technique in the home automation, and wireless communication between the residence gateway and electric appliances is one of the most important parts in the home network system. Universal Remote is a controlling device, which can perform all functions of different remotes of various brand appliances that are used in homes. At present, Universal Remotes do not stand up to their names, as they are not able to control all the devices.

Zhao,Y. and Xu,s. (2007) proposed the design and implementation of SOAP-based residential management for smart home system's appliances control. An appliance control module based on SOAP and Web Services developed to solvethe interoperation of various home appliances in smart home systems. Feedback based control channels implemented with residential management system through Web Services. If the residential management system experiences server downtime, the home appliances can still be controlled using alternate control mechanism with GSM network via SMS Module locally and remotely.

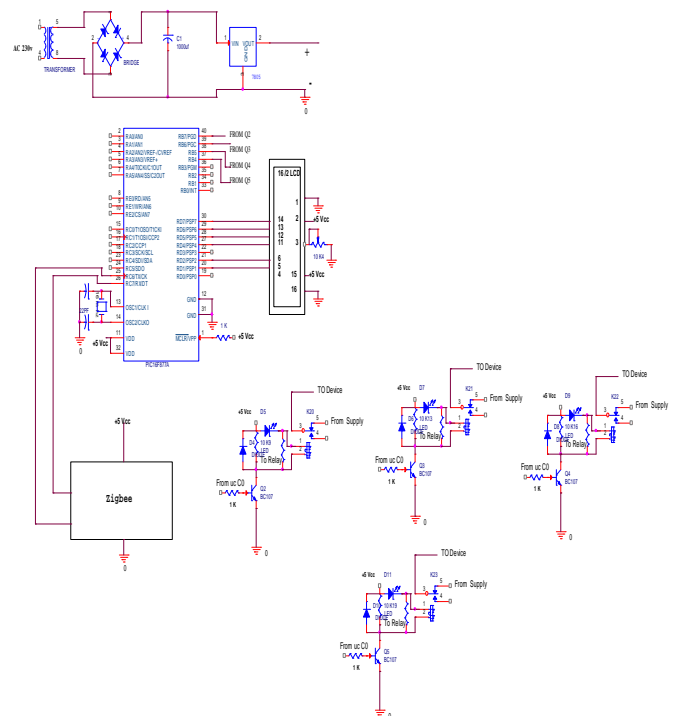
**Proposed System**

In this paper by using hand held devices can monitor the applications. For e.g., temperature sensor, humidity, pressure, can be viewed and can be monitored in domestic area networks. Can reset the target system level by fixing the time to the individual applications. In addition to the interface design, this work presents the solution to implement home automation and a sensor network to acquire context and to identify emergency situations. This project relies on power line communications and on the OSGi framework usage. The idea is to have a portable touchscreen device with the proposed interface.

The first menu the user has to deal with all the rooms of an apartment. When a room is selected, a new screen is presented containing all the items available to control in that room. In order to inform which room is selected at the moment. The icon that represents the room is shown at the top of the screen, while on the right side of it is a "home" icon, that allows the user to come back to the main menu.



**Fig 1** Circuit Diagram of Transmitter



**Fig 2** Circuit Diagram of Receiver

The concept of using different levels of screens containing icons representing the rooms, the appliances to be controlled and the commands was utilized in our work, but as it is intended to be universal, additional requirements were needed. Some works present systems based on a hardware-software co-design that allows speaker-independent speech recognition at an accuracy rate of 95%, without voice training. This interface was tested in a home automation environment using a ZigBee-based wireless sensors and actuators network. The command operation is executed via a predefined hand gesture. Another solution was developed to replace hand interaction using head movements and mouth position. Through serial communication and infrared, the system controls appliances shown in fig 1 & 2.

## RESULT

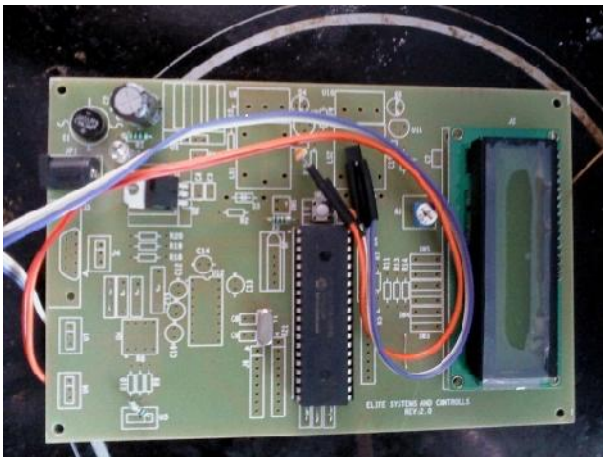


Fig 3 Real Time Output of Accessibility of Domestic Area Network Using Handheld Devices

By using hand held devices can monitor the applications. For e.g., temperature sensor, humidity, pressure, can be viewed and can be monitored in domestic area networks. The Real Time Output of Accessibility of Domestic Area Network Using Handheld Devices is shown in Fig 8. Analyzing the state of the art, it is possible to notice that the works on user interface for home automation for people disabilities are very specific, usually addressing a single type of impairment. There are works focusing on elderly, visually impaired people, hearing impaired, people with motor impairment and cognitive disabilities. Thinking about users with disabilities, it is necessary to invest efforts in the research and development of accessible interfaces.

## CONCLUSION

Working with a considerably varied group of users, with different needs, an interface suitable to them was achieved. Our interface integrates accessible interface ideas in a single portable interface that can contribute to people with disabilities' autonomy at home.

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### How to cite this article:

Anto Bennet M *et al.* 2016, Accessibility of Domestic Area Network Using Handheld Devices. *Int J Recent Sci Res.* 7(4), pp. 9971-9973.

Being a potential solution to improve the autonomy of people with impairments, the interviews have shown that home automation is not even considered as a possible solution to these people's reality. They consider home automation a high technology solution out of their reach. It points out to the demand for researching and developing lower cost and simpler solutions.

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T.SSN 0976-3031



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