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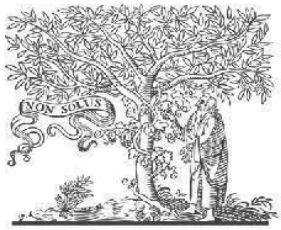

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IJIEMR Transactions, online available on 21th Dec 2024. Link

https://ijiemr.org/downloads.php?vol=Volume-13&issue= Issue12

**DOI:10.48047/IJIEMR/V13/ISSUE12/58**

Title: " ANDROID BASED SMART HOMNE USING BLUETOOTH"

Volume 13, ISSUE 12, Pages: 438 - 444

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# ANDROID BASED SMART HOMNE USING BLUETOOTH

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**ABSTRACT:**

This article describes the implementation of a Bluetooth technology and an android application with voice prompts based home-automated system using an Arduino microcontroller. The system is aimed at designing an automated appliance control that is userfriendly and convenient to use. The design comprised an Arduino ATMEGA328 microcontroller board, Bluetooth module (HC-06), and an android application (MIT App Inventor 2). The Arduino controls any connected component and was programmed with C++ programming language by using Integrated Development Environment (IDE). Relays and Triacs are used for the switching mechanism. Once the system is connected, the user controls the electrical appliances connected to the home-automated system, which can also be controlled using voice prompt with the help of a Google assistant inbuilt with the android smartphone. The system switches the home appliances ON and OFF using the android app, Bluetooth module, and voiced prompt. It can also be timed to switch off appliances for a pre-time of 12 h, thus making the application easy and convenient to operate via a smartphone.

## 1.INTRODUCTION

Home automation is the use of one or more computerized remote to control basic home appliances remotely and sometimes automatically [7]. It is designed to contr1ol lighting points, entertainment systems, and home security such as access control as well as alarm systems. Automation and wireless technology have become a key technology in the twenty-first century. It helps communication between one point to another without the use of cables, and this makes the system to be more secure [1]. The attractiveness of controlling electrical devices through a phone has been increasing because of its high performance and availability. Connecting appliances through smartphone is useful for the elderly and physically disabled persons, who can access and control the appliances from where they are located and access them remotely without the help of others. Time is a precious thing; everybody wants to save time as much as they can (Kannapiran and Arvind, [6, 2]). Home automation systems are a technological means of intelligent monitoring, control, feedbacks and actions of home appliances according to the needs of the home occupants. Wireless medium such as ZigBee, Bluetooth, wireless Fidelity (Wi Fi), Short Message Service (SMS), Android Application, Wireless Sensor Network (WSN), Radio frequency identification (RFID) and Software Defined Network just mention a few serves as a medium of communication between the appliances and the control unit and according to [17] home automation are essential for non-invasive and non-intrusive

implementation of the advanced automation system. Android, a vivid operating system, has 76.24% usage worldwide, and 78.05% of Nigeria's total smartphone market share [9]. Android has become the topmost used mobile gadget operating system (OS) on the market today. The Android smartphone has become the most popular and commonly used Operating System in our world, especially in Nigeria. This had made us base the control terminal of the home automated system on an android application as it has been shown that majority cannot do without their phone with them almost all the time [2]. Conventional home controlled systems and its components are all wired to the same cable that connects them to the home control panel. The key problem with conventional home controlled systems is that they require the mobility of the user to operate it, hence the need for automation.

## 2.LITERATURE REVIEW:

In recent years, the number of network enabled digital devices at homes has been increasing fast. With the rapid expansion of the Internet, the owners have been requesting remote control and monitoring of these in-home appliances. This leads to networking these appliances to form a kind of home automation system. In this paper, an Android based home automation system that allows multiple users to control the appliances by an Android application or through a web site is presented. The system has three hardware components: a local device to transfer signals to home appliances, a web server to store customer records and support services to the other components, and a mobile smart device running Android application. Distributed cloud platforms and services of Google are used to support messaging between the components. The prototype implementation of the proposed system is evaluated based on the criteria considered after the requirement analysis for an adequate home automation system. THE home automation is the introduction of technology within home to enhance the quality of life of its occupants, through the provision of different services such as telehealth, multimedia entertainment and energy conservation [1]. In other words, home automation aims the orchestration of digital devices to provide users with real comfort together with security and ability to monitor multiple dwellings [2]. Traditional home automation systems involve the control of digital devices which provide the functions such as heating, lighting and shading. But due to the rapid growth of information technology and modern entertainment systems in recent years, these primary functions are expected to be enriched with additional services (i.e., the stereo reducing volume when the telephone rings [2]). In [3], the benefits of home automation systems (the smart house systems) are listed as safety, comfort, power saving and communications. As the systems provide these benefits, some technical requirements must be also respected such as low cost, plug and play, flexibility, easiness of use and reliability [3]. In this study, a home automation system, which provides two alternative user friendly interfaces, an Android application and a web application, is presented. The system is built to serve multiple users, using up-to-date and emerging technologies, such as Google Cloud Platform, in order to support the communication between the main hardware components of the system. In the following sections, the pros/cons of the employed

technologies in the literature are discussed first and then the details of the proposed system architecture are given. After listing the analysis and evaluation criteria for an adequate home automation system, the paper is concluded with the possible future work comments.

There are different methods in wireless technology such as Bluetooth, WIFI, and GSM. In this paper, new design and different home appliances are presented. Bluetooth Based Home Automation System using Arduino UNO Microcontroller is design and implemented. PWM technique on Arduino is used to control the DC motor speed depending on the width of the Pulses and H-Bridge driver circuit is used to control the direction of the motor. The home automation applications that has presented in this paper is the ability to control the DC motor speed and its direction, bulb, fan and heater using a smart phone application with Bluetooth wireless technology. The relays is used to connect these appliances to the input/ output ports of the board .The design is a low cost, flexible and using a modern technology and devices for this application. Application of wireless Bluetooth connection in control board enables a simplified way to system installation. The system has been built and operated successfully. Home automation allows to control house appliances like door, light, fan, oven… etc. It also provides emergency system and home security. It enables the consumer more control of his home it facilitates many conditions, for example, if the consumer is on his way to his home, controlling light turning on, or pre-heating oven when he got home, therefore, many manual actions is replaced by home automation which reduce human efforts and time saving[1]. B. Murali Krishna, et al, are present a home automation system using Android Smart Phone to control an application. A Bluetooth module is connected to FPGA board to control the home appliances [2]. Satish Palaniappan, et al, are offers a good features for home automation via remote access. A GSM network is specified as a candidate for this purpose. The system is available from all over the world to a user in real time [3]. Sadeque Reza Khan and Farzana Sultana Dristy are present an Android based control system which can maintain the security of home main entrance and also the car door lock [4]. Aniket Yeole et al, are represents the implementation and design of a secure RTOS based home automation system using ATMEGA where the important features like electrical appliances and sensors are connected to the board through the Input/output ports [5]. Nupur K. Sonawane, et al, are presents the design and implementation of a low cost ,tangible, flexible based device automation system depending on secure cell phone[6]. Lia Kamelia, et al, are proposed and prototyped a system called door locks automation system using Bluetooth-based Android Smartphone. [7]. D.Jaya Sree and M.Jhansi Lakshmi are presents the design of Home Automation System which remains the existing electrical switches which status is synchronized in all the control system with low voltage activating method that provides more safety control [8]. Sonali Sen,et al presents a voice controlled home automation system which consists of an Arduino Uno microcontroller. The smart phones is using for control the operation [9]. In this paper, different design and home appliances are presented. Many different electric applications is controlled by using Arduino UNO Microcontroller Based

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Home Automation System. The system is used to control the DC motor speed and its direction, bulb, fan and heater using a smart phone application with Bluetooth wireless technology.

## 3.BLOCK DIAGRAM:

Home automation systems are a technological means of intelligent monitoring, control, feedbacks and actions of home appliances according to the needs of the home occupants. Wireless medium such as ZigBee, Bluetooth, wireless Fidelity (Wi-Fi), Short Message Service (SMS), Android Application, Wireless Sensor Network (WSN), Radio frequency identification (RFID) and Software Defined Network just mention a few serves as a medium of communication between the appliances and the control unit and according to [17] home automation are essential for non-invasive and non-intrusive implementation of the advanced automation system

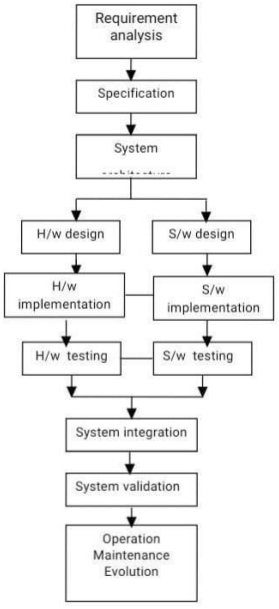


Fig:1

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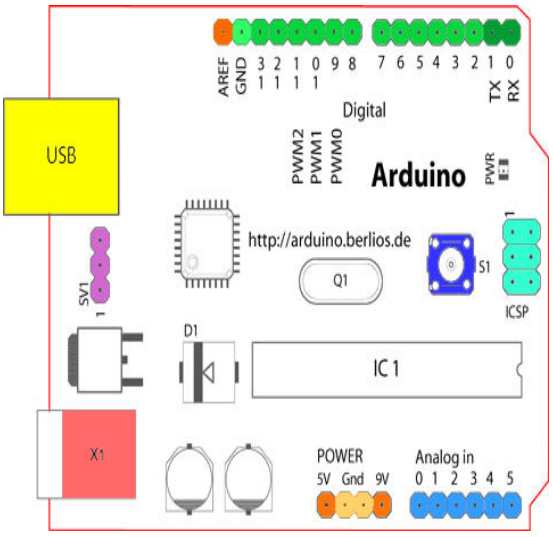


Fig:2

The Arduino is a family of microcontroller boards to simplify electronic design, prototyping and experimenting for artists, hackers, hobbyists, but also many professionals. People use it as brains for their robots, to build new digital music instruments, or to build a system that lets

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your house plants tweet you when they're dry. Arduinos (we use the standard Arduino Uno) are built around an ATmega microcontroller — essentially a complete computer with CPU, RAM, Flash memory, and input/output pins, all on a single chip. Unlike, say, a Raspberry Pi, it's designed to attach all kinds of sensors, LEDs, small motors and speakers, servos, etc. directly to these pins, which can read in or output digital or analog voltages between 0 and 5 volts. The Arduino connects to your computer via USB, where you program it in a simple language (C/C++, similar to Java) from inside the free Arduino IDE by uploading your compiled code to the board. Once programmed, the Arduino can run with the USB link back to your computer, or stand-alone without it — no keyboard or screen needed, just power.

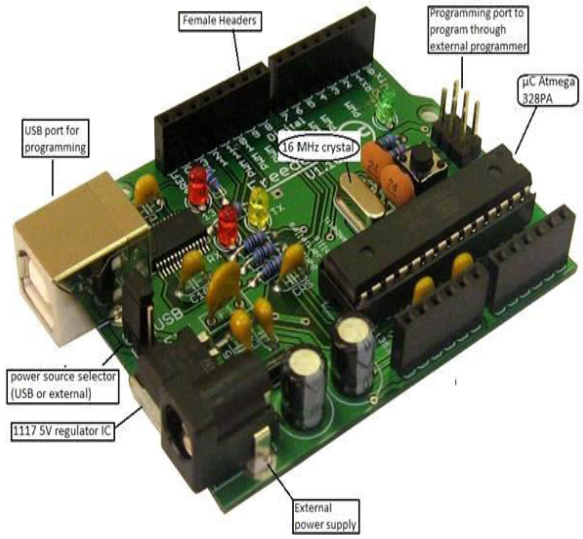


Fig:3.

## 4.SYSTEM REQUREMENTS:

Software requirements:

- Operating system : Windows7 & above versions
- Coding Language :MATLAB

Hardware requrements:

- Processor : Intel i3 and above.
- RAM: 4 GB and higher..

## 5. RESULTS:

### LAUNCH AND BLINK!

After following the appropriate steps for your software install, we are now ready to test your first program with your Arduino board!

The possibilities for detecting a brain tumor in the future are that if we get a three-dimensional image of the brain with the tumor, then we can also estimate the type of tumor as well as the stage of the tumor

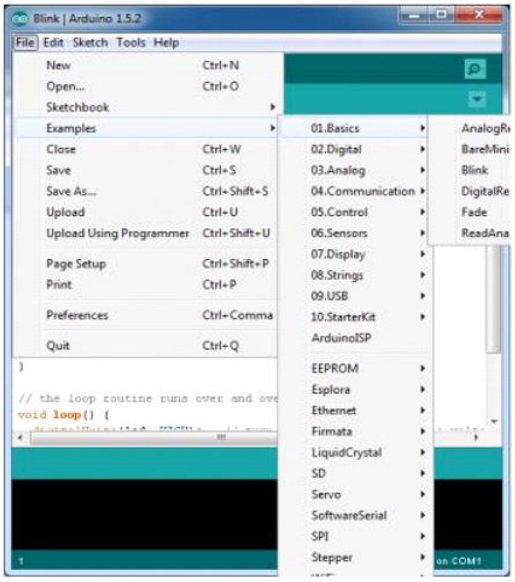


Fig:4

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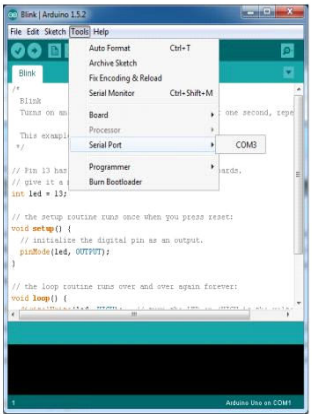

Fig:5

The Arduino is a family of microcontroller boards to simplify electronic design, prototyping and experimenting for artists, hackers, hobbyists, but also many professionals. People use it as brains for their robots, to build new digital music instruments, or to build a system that lets your house plants tweet you when they're dry. Arduinos (we use the standard Arduino Uno) are built around an ATmega microcontroller — essentially a complete computer with CPU, RAM, Flash memory

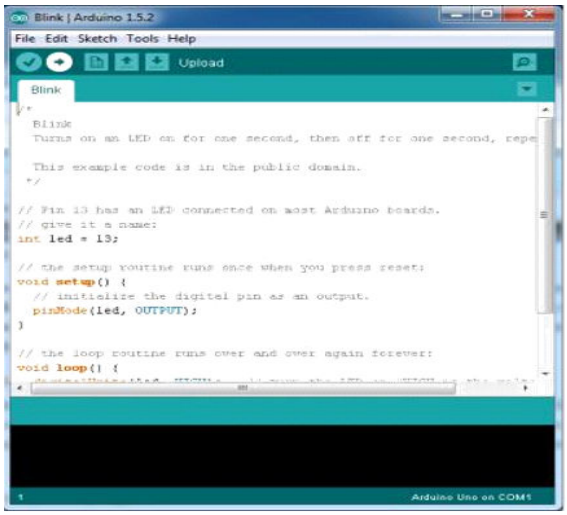

Fig:6

An Arduino based home automation system using Bluetooth and an android application with voice command has been designed and implemented. The Home automation system used an Android application and a Bluetooth technology in the design; this is because they are easy to use, fast, readily available, and reliable in communications between the remote user and devices. A low cost and highly reliable home automation system that can assist handicapped/old aged people, as well as a user-friendly device was developed. Other features can be added in the future such as biometrics so that unauthorised persons can not have access to the appliances and an also timing schedule can developed for each appliances connected this will effectively conserve energy.

The possibilities for detecting a brain tumor in the future are that if we get a three-dimensional image of the brain with the tumor, then we can also estimate the type of tumor as well as the stage of the tumor.

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## 6. CONCLUSION:

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