



HOME AUTOMATION SYSTEM

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ABSTRACT

Electronic devices and appliances have become very common in this recent year of technology especially with fast development in smartphones. In this paper, the design of Home Automation System compatibly with Local housing and good features for home automation via remote access are presented. GSM Based Home Automation System Using Android and Arduino is design and implemented. In this research work a part of smart home technology which using GSM in a mobile device is used, so it will cheap and efficient to use. This paper describes about home automation system which would use to enable home lighting, garage door motor, water pumping motor and smoke detection using a smart phone application with GSM wireless technology.

Keywords:- GPS Wireless Technology, Smartphones, Home Automation System, Arduino Uno, Android, GPS Module.

1.INTRODUCTION

Since Myanmar's telecoms revolution began in 2014, the number of internet users has risen from 2 million to more than 39 million, while the number of SIM cards in circulation has risen by almost 400 percent, according to government figures. Myanmar now has at least 33 million active mobile subscriptions in a country with an official population of 53 million. Today, most mobile phones using in Myanmar are 'smart phone', which offers more advanced capabilities in connectivity issues than regular cell phones. Smart phone usage rate is reported at 80% in Myanmar. Smart phone usually supports one or more short range wireless technologies such as GPS and infrared, making it possible to transfer data via these wireless connections.

Smart phone can provide computer mobility, ubiquitous data access, and pervasive intelligence for almost every aspect of business processes and people's daily lives. One of the smart phone applications that have been developed is smart homes technology. The fundamental of building an automation system for an office or home is increasing day-by-day with numerous benefits. Industrialist and researchers are working to build efficient and affordability automatic systems to monitor and control different machines like lights, fans, garage door motors, smoke detection and other requirements.

The use of GPS technology in a smart phone today is not just for the transfer of data and files only. In recent years, GPS technology is used one of the applications of home automation System. GPS technology operate over unlicensed, its available at 2.4GHz frequency, it also can link digital devices within a range of 10m to 100m at the speed of up to 3Mbps but it depending on the GPS device class. By using home automation System, we can control household appliances. So, many manual actions are replaced by reducing human efforts and time saving. 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 and that provides more safety for danger of electric shock and provide security to decrepit peoples.

In this paper, GPS based home automation system using android smart phones and Arduino UNO microcontroller board is used. Such a system will enable users to have control over home lighting, water pump and garage motors and smoke detection in their home with GPS. The main requirement for user is an Android smart phone, which is present in almost every person hand nowadays, and a control circuit. The control circuit consists of an Arduino Uno microcontroller, which processes the user controls switching of devices and detect the alarm. The microcontroller and the smart phone are connected with GPS wireless technology because GPS technology is low cost to use and secure wireless network. This application also focuses on smoke detection with secure application against unauthorized user. Remote operation is achieved by any smart phone/Tablet etc., with Android OS, upon a GUI (Graphical User Interface) based touch screen operation.

2.MOTIVATION

The motivation for developing smart home systems comes from many reasons, but most prominent are convenience, security, energy management, connectivity and luxury. Smart Home systems are one of the newer areas of research that have not been fully integrated into our society.

3.OBJECTIVES

- Develop home automation remote system.
- Use different inner and outer network technologies.
- Use devices that are easy to install.
- Use low price materials and devices.
- Make it suitable for inexperienced users and even disabled people.
- Make it scalable for further add-ons.

4.LITERATURE REVIEW

1. Pei Zheng, Lionel Ni, Smart Phone and Next Generation Mobile Computing, Morgan Kaufmann publisher, San Fransisco. 2006 [1]. "Smart Phone and Next Generation Mobile Computing is essential reading for any professionals and students involved in this dynamic field. The book provides a comprehensive treatment of fundamentals and covers the most recent technology advances. It describes not only how, but also why, through many insightful examples." --Dr. Wei Zhao, National Science Foundation "This book presents a detailed and comprehensive exposition of all important technologies related to mobile communication and pervasive application development using smart phones. This is a timely publication and it would be a very useful resource for educators, researchers, and developers in this field." --Professor Anand Tripathi, University of Minnesota "This book is something else. It is not often that you see a book that is as up to date as this one while also covering a broad swath of wireless technology...this book is very much up to date and a good reference to all the most current wireless technologies." --*Electronic Design*, Louis E. Frenzel, July 2006.
2. R. John Robles and Tai-hoon Kim, "Applications, Systems and Methods in Smart Home Technology [2]. LoRa devices are also well-suited for many common smart home applications on the market today, such as smart lighting, door and window sensors, motion sensors, smart locks, smart irrigation, and more. The lower power consumption of LoRa devices offers a compelling alternative to Wi-Fi or Bluetooth-based battery-operated IoT devices. Frequently recharging or changing batteries on sensors can be inconvenient, particularly when sensors are placed in hard to reach areas. Worse, home security devices that drain battery power quickly can pose a risk, failing at the very moment when they are needed. LoRa solves these shortcomings by enabling devices which leverage its extremely low power communication capabilities to run for years on a single battery or charge.

5. RELATED WORK

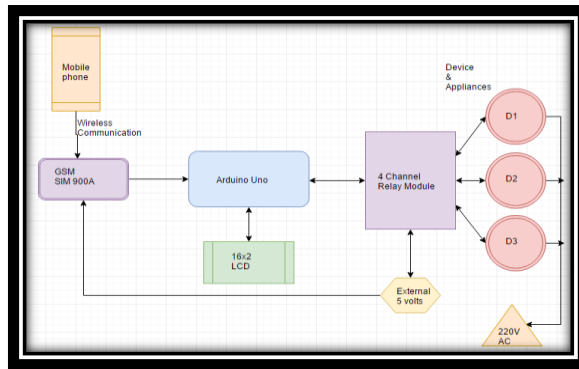


Fig. Block diagram of home automation system.

GPS module that has been set to slave mode is used to communicate the controller with the smart phone application. Application is created by App Inventor 2. App Inventor 2 is a visual, blocks language for building Android Apps. There are two main types of components in an app Inventor 2, visible and non-visible. Visible components of application are can see when the app is launched that includes buttons, text boxes, and labels. These are often referred to as the graphical user interface (GUI). Non-visible components are not seeing, so they are not part of the user interface. Instead, they provide access to the built-in functionality of the device. The non-visible components are the technology within the device they are little worker bees and they do jobs for control of the application. App Inventor 2 can easily create GUI interface for user friendly and block editor can make the relevant function of each button from application easily without writing coding.

6. CONCLUSION

This project is indeed a low-cost and efficient project for home application. This project is also a cost-effective project with a simple and easy to use interface for decrepit and physically disables peoples. By using this method, home appliances can be controlled to avoid the dangerous of electric shock and convenience for users. It can make secures home by alerting people when smoke detected or gas is leaked in the home. With few additions and modifications, this project can be make commercial scale products for Home Automation System. In future we can add temperature sensors so that it can monitor some surrounding temperature parameters around the house and we can improve the communication using Internet web base technology. This project can also promote with wireless camera, in order to incorporate other security features of Smart Home Automation System. In terms of upgrading security in the home, doors and windows are also mounted by setting alarm in case of any kind of thief or sabotage.

7. REFERENCES

- [1] Pei Zheng, Lionel Ni, Smart Phone and Next Generation Mobile Computing, Morgan Kaufmann publisher, San Fransisco. 2006.
- [2] R. John Robles and Tai-hoon Kim, "Applications, Systems and Methods in Smart Home Technology:
- [3] Muhammad Izhar Ramli, Mohd Helmy Abd Wahab, Nabihah, "TOWARDS SMART HOME: CONTROL ELECTRICAL DEVICES ONLINE", Nornabihah Ahmad International Conference on Science and Technology: Application in Industry and Education (2006)
- [4] N. Sriskanthan and Tan Karand. "Bluetooth Based Home Automation 2002.
- [5] E. Yavuz, B. Hasan, I. Serkan and K. Duygu. "Safe and Secure PIC Based Remote Control Application for Intelligent Home". International Journal of Computer Science and Network Security, Vol. 7, No. 5, May 2007

[4] Amul Jadhav, S. Anand, Nilesh Dhangare, K.S. Wagh “Universal Mobile Application Development (UMAD) On Home Automation” Marathwada

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