Design of Efficient and Remote-Controlled Home Automation System for Physically Challenged People

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Abstract- This project presents the design of the low-cost and secure remote controlled-based efficient lighting and electrical appliance control for the physically challenged people according to their need and comfort. Automation is the use of practical systems and various information technologies to reduce the need for human work in the making of goods and services. Home automation technology is increasing in the number of households it is in because of all of the benefits it presents. Home automation has also been proved to be a tremendous benefit for the elderly and disabled. A form of home automation systems called assistive domestics provides a wide range of features that can aid in those with particular accessibility concerns in their homes. These technology systems and assisting equipment have become a viable option for those who would rather stay in their homes than move to assisted living facilities. To sum it up, home automation for the elderly and disabled is changing lives every single day. In this paper, we describe the design and development of a remote household appliance control system using microcontroller AT89C51 and a remote. Range could be an important factor but as here we are dealing with physically challenged it can be not stressed upon.

Indexed Terms- Home automation, Remote, Microcontroller AT89C51, Moving Sensor, Physically Challenged, Microcontroller AT89C51.

I. INTRODUCTION

In order for disabled people to be independent and autonomic in their environment, features such as freedom of movement, easy access and control should be available. The goal of this project does not lie in this last point only, but also the integration of all these assistive parameters in a fully complete Intelligent Smart Home design

Home automation systems offer a wide range of excellent features that can make anyone's life easier and more enjoyable. But this is especially important in the case of disabled or elderly people who have particular accessibility concerns for their home.

When most people think about home accessibility technology, they typically get about as far as stair lifts and easy-access showers or baths. Perhaps they also think of a few handrails, moving the position of light switches, and that's about it. But with today's technology there is much, much more that you can do. From using your phone as a control system to replace any switches that are difficult to reach, to automatic doors and electric cabinet tracks, this article provides an overview of some of the best home automation technology.
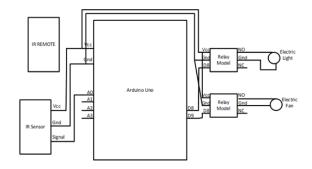
Lighting Control:
The most obvious home automation technology to mention is lighting control. This is usually the starting point for any home automation system, and there is a very wide range of products and solutions out there which you can use to upgrade your home's lighting system without spending a fortune.

The ability to control your lights via a remote control or smartphone app is an excellent tool for anybody who has mobility problems or trouble reaching light switches. If this is all you want, then you can do it for a very low price as well.

Other useful lighting solutions include the ability to have lights turn off automatically when you leave the room, or to turn on automatically when you enter a room - although the latter does also require light sensors and a little extra set-up to prevent the lights coming on during the day when they aren't needed.

- Circuit Diagram

In-Home Automation system we control all the electrical appliances with the help of IR Remote which can be used by the physically challenged people in a house, Here IR Remote is connected to the wireless sensor it acts as a receiver to the Remote, and this receiver is connected to the Arduino uno as input, and Arduino is programmed like by pressing a key in the remote the electrical appliances should on and by pressing other key the electrical appliances should get off, the electrical appliances will get the information by the Arduino through electrical relay, the relay is connected as normal open mode, when the information to the relay is high through the Arduino digital output the relay will be pushed to normal close mode, hence the electrical appliances in the home will switched on, like wise we can connect any number of application in a home.

II. LITERATURE SURVEY

1. How to use the ICF, A Practical Manual for using the International Classification of Functioning, Disability and Health (ICF) This paper defines the Percentage of Physically Challenged people in the world according to WHO.
2. Home Automation System For Disabled People Using BCI Elderly and disabled people are more likely to be exposed to daily life problems than other healthy people. The Smart Home or Home Automation application and development includes various implementation, methods and techniques. Smart home systems are created based on the needs and budget to cater for the system. With technologies available today, efficient integration of this system could be achieved.
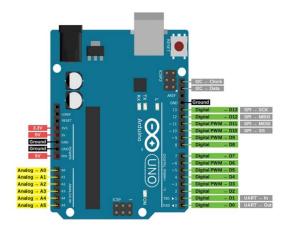3. Smart Home Design using Wireless Sensor Network and Biometric Technologies Smart Home

is an integration system, which takes advantage of a range of devices such as computers, network communication as well as synthesized wireless technology to connect all indoor subsystem that are attached to home appliances, household and electrical devices

4. A History of Control Engineering The term automation, inspired by the earlier word automatic (coming from automaton), this was not widely used before 1947.
5. Review Smart Home Communication Technologies and Applications Home automation technology and Smart Home appeared very much in science fiction of the 1920s. Home Automation Application Areas include Energy Management, Renewable Energy Management, Driven Smart Home, Health Care Systems and Advanced Multimedia Services, Surveillance and Security etc.
6. Home Automation Using Internet of Things Advantages of Home Automation Systems are: System scalability and easy extension Aesthetical benefits and Integration of mobile devices.
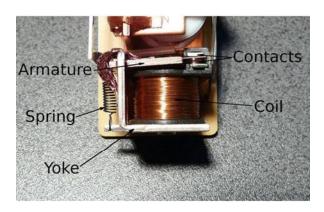
III. ADVANTAGES

1. Increased Energy Efficiency
2. Remote control of home functions
3. Home management insights
4. Improved appliance functionality
5. Prevent children from electric shock

IV. MODELLING OF DIFFERENT COMPONENTS

- ARDUINO UNO

- INTERNAL RELAY CIRCUIT

CONCLUSION

Home automation systems had progressively developed as an important field of control systems. The implementation of such systems continuously increased especially with the tendency to standardize their processes. In fact, the capability of devices of different kinds and issuing from various manufacturers to cooperate, communicate and function with high levels of harmony becomes an important factor. Moreover, advanced processes and numerous techniques that are presented intend to reduce the prices of smart home, make the integrated system easier and handled with simplicity, and to achieve permanent degrees of security. The proposed home automation system is dedicated for elderly, people with disabilities, handicapped persons and others. It consists of remote control supported by command buttons and provided by alert LEDs and a LCD for showing messages. The unique master board toggles the ON/OFF switches of the appliances by means of relays. The remote control and its base are communicating with RF signals realized. In spite of designing our system for individuals that may require load efforts to move, it can be scalable for other users with the ability of appending multiple functionalities and various modalities. However, it can be also adopted in hospitals, health care centers and hospices. another advantage of this technology resides in the characteristics of putting the system in sleep mode when it is unused for a period and then awaking it when commands are induced. This feature is of great interest since it ascertains an energy saving option and low power consumption.

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