MANTECH Publications

Journal of Android iOS Development and Testing
Volume 8, Issue 3, September-December 2023

Smart Home System with Google Assistant using Arduino

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Abstract

This project report focuses on creating a smart home system using Google Assistant and Arduino. The integration of Google Assistant allows user to control various appliances and devices in their phone through voice commands. The Arduino platform is used for the communication and control between the Google Assistant and the devices. This report provides an overview of the components used, the circuit modeling and analysis, and the potential applications and future scope of this smart home system.

Keywords: *Smart home, Google Assistant, Arduino, Voice control, Automation.*

INTRODUCTION

The concept of a Smart home involves the use of technology to automate and control various aspects of the home environment. With the advancement of voice assistants like Google Assistant, controlling home appliances through voice commands has become more convenient.

This project aims to create a smart home system using Google Assistant and Arduino, offering a seamless and hands-free experience to users. As the computer science engineering students of Presidency University this project gives us a chance to practice all the knowledge and skills which we already gain along the academic session in solving problems through a project in order to be an efficient and a good engineer. "Home Automation" refers to the

automatic and electronic control of household features, activities, and appliances. The utilities and features of our home can be easily controlled via Internet. There are three main elements of a home automation system: sensors, controllers, and actuators. Having day to day developing technology is a proud moment to the whole world. The foremost aim of technology is to increase the efficiency and to decrease.

Human Assistants like housekeepers were a way for millionaires to keep up their homes in the past. Even now when technology is handy enough only the well to do people of the society is blessed with their new smart home devices, as these devices costs are a bit high.

Components

- Arduino Board
- Wi-fi module
- Relay modules
- Light sensors
- AC and DC appliances
- Various resistors, Capacitors and other electronic components.
- Jumper Wires and a breadboard
- Power supply
- Google Assistant API
- Arduino IDE
- Google Cloud Platform account

MODELING AND ANALYSIS

Circuit Explanation

The circuit for this smart home system can be divided into three main sections: the Google Assistant integration the Arduino control unit, and the connected devices. The Google Assistant is integrated using the Google Assistant SDK, allowing it to understand voice commands from the user and send them to the Arduino via a wi-fi connection. The Arduino board receives the commands and controls the connected devices based on the users instructions.

Various sensors and actuators can be connected to the Arduino, such as temperature sensors, motion sensors, lights, fans, etc., enabling a wide range of functionalities.

Block Diagram

A block diagram represents the overall architecture of the smart home system. It illustrates the flow of information and the control between the Google Assistant, Arduino, and connected devices. The Google Assistant layer processes voice commands and sends them to the Arduino layer. The Arduino layer receives these commands, performs necessary processing, and controls the connected devices accordingly.

Nodemcu ESP8266 is linked with Blynk applications account with the IFTTT website which is connected to the Google assistance cloud. Home appliances like bulb, fan and motor are connected to the Nodemcu ESP8266.

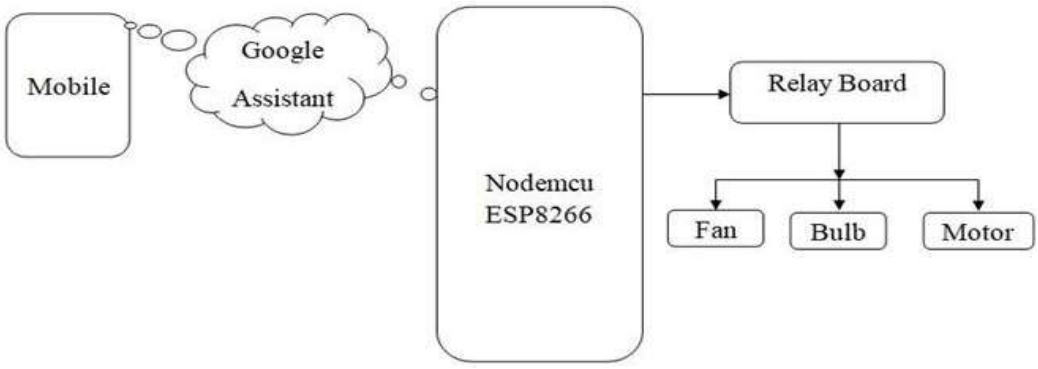

Figure 1:

CONCLUSION

This project successfully demonstrate the integration of Google Assistant with Arduino to create a smart home system. The voice controlled functionalities provided by Google assistant offer an intuitive and convenient user experiences. Through the implementation of various sensors and actuators, The Arduino enables automation and control of different devices in the home environment.

Applications

1. Control Lighting
2. Control Temperature

3. Control Security system
4. Control Entertainment devices

Future Scope

The development of this smart home system can be expanded further by incorporating advanced features. Integration with other voice assistants, such as Amazon Alexa or Apple Siri, can be explored.

Additionally, Machine learning algorithms, can be implemented to analyze user behavior and personalize the home environment accordingly. The future scope also includes the integration of smart home devices from different manufactures to provides comprehensive home automation solution.

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