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Smart Switch Board Compatible with Google Assistance Along with Face Recognition and Security System

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Abstract - *With the advancement of technologies in the market the standards are needed to revolutionize an attempt to implement 'Smart Switch Board' to operate over fully home automated system which provides the user vast reliable features from simple switch control to load current intensity variable features, face recognition approach to have predefined designed features for the user to control different parameters for different household appliances, which can be achieved by algorithms like CNN as it provides higher efficiency additional to face recognition and security system for the home is an optional feature to the user to stay protected against any theft which may enter the house such that if the face is recognized with the known database then it is matched with the desired user parameter else it is identified as theft and desired actions are performed along with rising alert.*

Key Words: **Google Assistance, Convolution Neural Network, Face Recognition, Node MCU**

1. INTRODUCTION

Human life will become more comfortable when it will have devices which will listen to it. In case of elderly people and physically impaired people it is very difficult to get up and operate devices hence in order to make their life comfortable this paper proposes the system which will take voice commands and operate devices. The concept behind the project is to control home devices by sitting at the place, this can be done by our proposed system which involves google assistant which will listen to our command and operate devices accordingly this includes turning devices on and off also varying their intensity as per our need. This also provides door lock and unlock system by voice commands, the person will come to know who is at the door this can be done by face recognition system at the door, and hence the system also provides safety to person. Further additional home security features can also be included. This will provide cost efficiency and reliability. This can be achieved by CNN algorithms and advanced processors.

1.1 Literature Review

According to survey there exists many systems which can control home appliances using android and other operating systems each system has its unique features. Currently many companies official registered are working to provide better home automation system features. Following systems describes the work being performed by others. N. Srikanthan [1] has worked for and also explained modern home automation systems systems using Bluetooth via PC. It was working efficiently also but the problem was it was unable for user to control remotely or using mobile phones. Web based prototype electrical device control system by Muhammad Izhar Ramli [2]. They also set the server with auto restart if the server is currently down. Hasan has developed a telephone and PIC remote- controlled device to control the devices pin check algorithm has been introduced where it was with cable network. Hence here the system worked well but it was wired system. Then an application was developed by Amul Jadhav [3] in a universal XML format which can be easily ported to any other mobile devices instead of just targeting a single platform. Each of these systems has their own unique features and in comparison, toone another lacks some advancement. Our designed system has application layer prototype. The application is able to synthesize the speech data with the help of Google Voice Reorganization. The synthesized data are analysed and further processing is carried out. In layman words, our design system provides features of controlling the home appliances using voice commands. To connect the android application with the raspberry pi the use of socket programming is performed. This further adds security to our system. The data are received only by the server at the specified port and data are further analysed. The project which is proposed by us is different than the system which were developed earlier .This project uses android operating system which is now easily available on almost every mobile phone hence easy to operate.

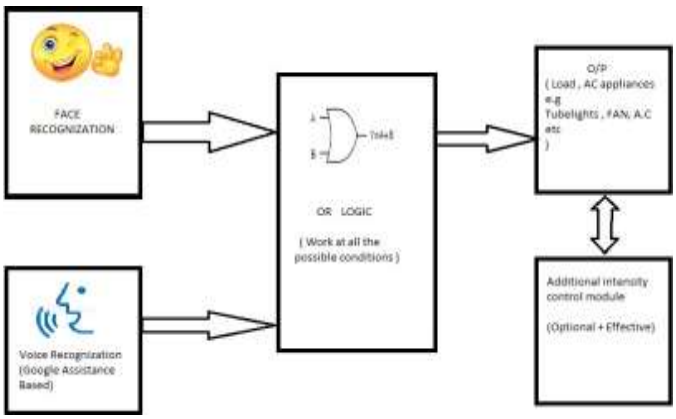
2. PROPOSED SYSTEM

Smart switch board compatible with google assistant and face recognition system is the modified version of home automation system or smart home. Proposed system will provide access to the switches in home, offices without physically moving or reaching to the switches. We will be able to handle them by just ordering to them. For eg.by ordering fan to turn on fan will be turned on.it will be voice controlled. Intensity can also be varied as required of the appliances' only that the system will have priority- based handing or operation. And all these things will be done in following mode.

1. Switch Mode 2.Voice Mode

Switch mode: This will be the normal mode of operation, the way we do in our home, physically going to the switches and turning them on or off.

Voice Mode: In this mode we will be having facility to operate switches by voice-controlled system. This will be done by accessing google assistant in phone. The second method is based on the principle power electronics devices the variable output can be achieved by SCR followed by Bridge circuit you are simple the output is control based on firing pulse of the SCR which is we are changing the duty cycle of the input and desired varying output is achieved. Basic principle used here is pulse width modulation via the firing angle of SCR Two- Way simultaneous working: Face recognition and voice control use over here are the two particular method to operate the switching at load the voice control which is achieved by using the Google assistant and the face recognition which is achieved by the use of the convolution neural network but to achieve the maximum efficiency the output of both face recognition as well as voice control are passed through the OR logic circuit due to which unless both the circuits are of the switching be done .



2. Diagram of the proposed system

1. Face Recognition: For face recognition, we are using a camera as an input source. Even a webcam can be used for further advanced image processing. We are using Convolution Neural Network algorithm for image processing and enhancement of the captured images.

2. Convolution Neural Network: Convolution neural networks (CNNs) are a tool, a means of adaptive image processing, and a link between general feed-forward neural networks and adaptive filters. Two-dimensional CNNs consist of one or more two-dimensional filter layers, with potential non-linear activation and/or down-sampling functions. CNNs have important translation invariance properties and local spatial relations (receptive fields). We present a description of the convolution network architecture and an application on a mobile robot for practical image processing. A CNN is used on an autonomous sewer inspection system to identify and classify cracks. In all cases, the filter sizes used were 4x4, with non-linear activations between each layer. From input to output, the number of feature maps used in the three hidden layers was 4, 4, 4.The network was equipped using a dataset of 48x48 sub-regions from 320x240 pixel frames of 30 still images taken from a pre-recorded video of sewer pipe inspection. Fifteen frames have been used for testing and fifteen for network performance validation.

Features

1. Cost Effective
2. Easily compatible with normal device AC, Fan etc.
3. Highly secured plus Backup
4. Supports face recognition
5. Priority based intensity control of devices
6. Voice controlled operation of devices

3. CONCLUSION

Thus for the home automation we have used two approaches which is based on face recognition and voice recognition the utilisation of the above two approaches ensures us maximum efficiency and working possibilities for all different conditions and caes. To achieve this particular working we have implemented an or logic which will ensure us that even if anyone particular approach fails the other one gives us the backup for the failed system and vice versa. Depending upon user priority the particular parameter of a load are varied.

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