IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE FOR SMART RESIDENCE

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Abstract: In Todays Robotic Era the customization and modification of residential home are running trends. This can be possible by using the artificial intelligence in which we are converting our living room in different kind of environment like Disco, pub and party house and study environment plus traditional functions environment according to our need. We can customize and covert our single environment of residential home in a such a way we are applying the entire artificial intelligence for controlling the each system available in the residence like we can ON and OFF the Lights, Fans and also smartly we can operate a switches from remote location. Digitally we can operate the AC system. Each appliance in the residence under the observation and control of user it will save the electricity and provide the high level of security and safety. The system can be possible to implement through configuration and synchronization of different types of cross platforms that are Rasbiance, Android and some kind of database.

Index Terms — Home automation, Smart phone, Arduino, Bluetooth, Home Appliances, Arduino board, sensors.

I. INTRODUCTION

The "Home Automation" concept has existed for many years. In 1975, X10 the first general purpose home automation network technology was developed. It is a communication protocol for electronic devices. It primarily uses electric power transmission wiring for signaling and control, where the signals involve brief radio frequency bursts of digital data. and remains the most widely available. Home automation is the residential extension of building automation and involves the control and automation of lighting, heating, ventilation, air conditioning, appliances, and security of these systems. Due to the advancement of wireless technology, there are several different of connections are introduced such as GSM, WIFI, ZIGBEE, and Bluetooth. Each of the connection has their own unique specifications and applications. This proposed system presents the overall design of Home Automation System with low cost and wireless system. This system is designed to assist and provide support in order to fulfill the needs of elderly and disabled in home. Also, the smart home concept in the system improves the standard living at home. Main focus of this system is to control the household equipment's like light, fan, AC etc. automatically. In hazardous condition, it is useful for old aged and handicapped persons. In this system , A detailed survey on home control automation using GSM is included..

II. LITERATURE SURVEY

Many Authors designed home automation systems by using different technologies. By using GSM based home automation System we need to send message/make a call to control home appliances. It has more time delay and complex system. By using Bluetooth home automation system also we can control all the home appliances. But the main disadvantage is Range. Some authors designed home automation using Wi-Fi. But in those designs they implemented only ON/OFF functionalities. In our design we implemented ON/OFF functionality along with the voltage variations and all the home appliances are controlled by using android application. This paper describes how to control and monitor home appliances using android application over internet. There are number of commercial home automation systems available in market. However, these are designed for limited use. Therefore, home appliances can individually be controlled both from Implementation of Artificial Intelligence for Smart Residence within the home and remotely. This is very helpful to physically challenged people. In this paper a low cost and user friendly remote controlled home automation system is presented using Arduino board, Bluetooth module, smart phone, ultrasonic sensor and moisture sensor. A smart phone application is used in the suggested system which allows the users to control up to 18 devices including home appliances and sensors using Bluetooth technology. Nowadays, most of conventional home automation systems are designed for special purposes while proposed system is a general purpose home automation system. Which can easily be Implement in existing home. Suggested system has more features than conventional home automation systems such as an ultrasonic sensor is used for water level detection and soil moisture sensor is use for automatic plant irrigation system. This paper also describes the hardware and software architecture of system, future work and scope. The proposed prototype of home automation system is implemented and tested on hardware and it gave the exact and expected results. The Internet of things is characterized by a high level of heterogeneity between its diversified systems ranging from entertainment to

automation process. A smart home application is intrinsically dynamic in the sense that it makes up a time series, whose behavior may change over time. The challenge of the incoming data prediction in a smart home is to analyze the energy consumption of each appliance and to notify the risks to remotely control the installed wireless sensor network. This paper proposes a new methodology of data mining in order to predict energy consumption, environment parameters and moving (presence) cases. We present a prediction model based on a hidden-Markov model based for the smart home environment. This model is used as a classification machine learning but it has never used for the incoming data prediction in a smart home. Using a real Smart Life database, we demonstrate the validity of our methodology in the scenarios of smart homes incoming data prediction. The proposed prediction technique is tested and proves that there is a high amount of reliability on the considered model. With the rapid increase in usage and reliance on the vivid features of smart devices, the need for interconnecting them is genuine. Many existing systems have ventured into the sphere of Home Automation but have apparently failed to provide cost-effective solutions for the same. This paper illustrates a methodology to provide a low cost Home Automation System (HAS) using Wireless Fidelity (Wi-Fi).This crystallizes the concept of internetworking of smart devices. A Wi-Fi based Wireless Sensor Network (WSN) is designed for the purpose of monitoring and controlling environmental, safety and electrical parameters of a smart interconnected home. The user can exercise seamless control over.

III. OBJECTIVE

Replacing the traditional system with smart automation of Residency.
- For accessing the appliances smartly the smart phone is used.
- In some situation for handicapped people the hand gesture recognition system used for accessing appliances.
- Smartly saving the electricity using the unit counting and the Smart phone can have access to these unit counting and dropping of units.
- Sensing the environment of residency and day to day activity of humans and according to that appliances can be work.

IV. MOTIVATION

To provide easy access of home equipment's to old aged and handicapped persons.
- To provides more safety control on the switches with low voltage activating method.
- In order improve the standard living in home, this system provides Android based application.
- Main focus is to control home equipment's like fan, AC, Bulb etc.

The main system implements wireless GSM technology to provide remote access from smart Phone. The design remains the existing electrical switches The system intended to control electrical Appliances and devices in house with relatively low cost design, user-friendly interface and ease of installation.

V. ARCHITECTURAL DIAGRAM
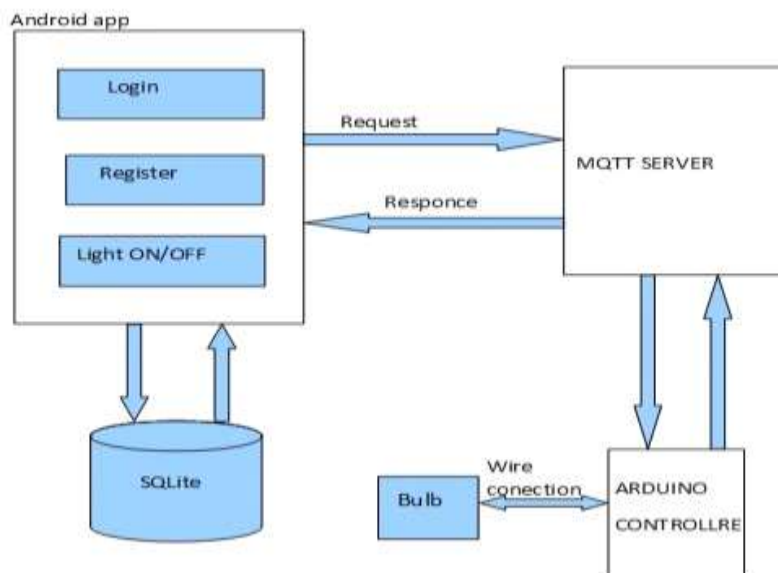
VI. TECHNOLOGIES TO BE USED

1) JAVA:

Java has been tested, refined, extended, and proven by a dedicated community of Java developers, architects and enthusiasts. Java is designed to enable development of portable, high-performance applications for the widest range of computing platforms possible. By making applications available across heterogeneous environments, businesses can provide more services and boost end-user productivity, communication, and collaboration— and dramatically reduce the cost of ownership of both enterprise and consumer applications. The original and reference implementation Java compilers, virtual machines, and class libraries were originally released by Sun under proprietary licenses. As of May 2007, in compliance with the Specifications of the Java Community Process, Sun re-licensed most of its Java technologies under the GNU (General Public License). Others have also developed alternative implementations of these Sun technologies, such as the GNU Compiler for Java (byte code compiler), GNU Class path (standard libraries), and Iced Tea-Web (browser plug in for applets).

2) MySQL:

MySQL is the most popular Open Source Relational SQL Database Management System. MySQL is one of the best RDBMS being used for developing various web-based software applications. MySQL is developed, marketed and supported by MySQL AB, which is a Swedish company. *MySQL* is the most popular Open Source Relational SQL Database Management System. MYSQL Enterprise edition includes the most comprehensive set of advanced features & management tools for MYSQL. MYSQL is the world's most popular open source database. Whether you are a fast-growing web property, technology ISV or large enterprise, MYSQL can cost-effectively help you deliver high performance, scalable database applications. MYSQL is popular choice of database for used in web application & is a central component of widely used LAMP open source web application software stack. MYSQL Query Analyzer: To optimize performance by visualizing query activity and fixing problem SQL code

VII. PRODUCT PERSPECTIVE

➢ With the increase in consumption of energy and population, there is a grave need to conserve energy in every way possible.
➢ The inability to access and control the appliances from remote locations is one of the major reasons for energy loss. A web or an android application is used by the users to give instructions to these systems.
➢ This system can make use of a host of communication methods such as Wi-Fi, GSM, Bluetooth, ZigBee.
➢ Main Perspective is consumption of energy using web or android applications from remote locations.

VIII. SYSTEM SPECIFICATION

S= {S, s, X, Y, T, f$_{main}$, DD, NDD, f$_{friend}$, memory shared, CPU$_{count}$}
➢ **S (system)**:- Is our proposed system which includes following tuple.
➢ **s (initial state at time T)** :-GUI of Home Automation. The GUI provides space to enter a query/input for user.
➢ **X (input to system)** :- Input Query. The user has to first enter the query. The query may be ambiguous or not. The query also represents what user wants to search.
➢ **Y (output of system)** :- List of URLs with Snippets. User has to enter a query into Home Automation then Home Automation generates a result which contains relevant and irrelevant URL's and their snippets.
➢ **T (No. of steps to be performed)** :- **6**. These are the total number of steps required to process a query and generates results.
➢ **f$_{main}$(main algorithm)** :- It contains Process P. Process P contains Input ,Output and subordinates functions. It shows how the query will be processed into different modules and how the results are generated.
➢ **DD (deterministic data)**:- It contains Database data. Here we have considered ON OFF Trigger values . which contains number on off trigger values . Light ON OFF trigger value use for showing results. Hence, ON OFF trigger value is our DD.
➢ **NDD (non-deterministic data)**:- No. of input queries. In our system, user can enter numbers of queries so that we cannot judge how many queries user enters into single session. Hence, Number of Input queries are our NDD.
➢ **f$_{friend}$** :- WC And IE. In our system, WC and IE are the friend functions of the main functions. Since we will be using both the functions, both are included in f$_{friend}$ function. WC is Web Crawler which is bot and IE is Information Extraction which is used for extracting information on browser.
➢ **Memory shared**: - Database. Database will store information like list of receivers, registration details and numbers of receivers. Since it is the only memory shared in our system, we have included it in the memory shared.
➢ **CPU$_{count}$**: - 2. In our system, we require 1 CPU for server and minimum 1 CPU for client. Hence, CPU$_{count}$ is 2.
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Subordinate functions:
• Identify the processes as P.

$$S= \{I, O, P....\}$$
$$P= \{TD, AD\}$$

Where,
- • TD is Trigger data for Arduino
- **TD= {U, MAX, LG}**
  Where,
  - • U=ON OFF trigger
  - • MAX = {0,1}
  - • LG is output where Light ON or OFF base on U .

- **AD= {LG, Arduino Controler, Info}**
  Where,
- • LG is input which is given to AD

Arduino is use for Glow Light ON or OFF

IX. ALGORITHM

- ➢ Step 1: register on App with Mobile no,UserName and Password.
- ➢ Step 2: Get user Trigger value .
- ➢ Step 3: call Arduino function
- ➢ Step 2.1: Get U as Input to TD.
- ➢ Step 2.2 : for i=0 to MAX
- ➢ //MAX = maximum no of Trigger to be generated by user.
- ➢ Step2.3 : trigger goes to TD
- ➢ Step 4.1 : Get TD as Input .
- ➢ Step 4.2 :Call Arduino function
- ➢ Step 4.3: Process trigger data.
- ➢ Step5: Display Result Light ON or OFF.
- ➢ Step 6: Stop.

X. CONCLUSION

Designing a system that can be easily used in home and residence for smart access of appliances. Typical classical system can be replaced by these new designs for remote location area. People who are elderly or disabled benefit the most from a home automation system that employs artificial intelligence.

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