

# Voice Controlled Industry Automation System using Arduino

Mukesh K. Kanjare

Nishigandha S. Unhale

Rahul R.Ambalkar

**Abstract** — This paper proposes a system for automation which is mainly design by considering the parameters such as accuracy, reliability, flexibility and some personal benefits. In some areas, the rise of machines may be considered as ominous but other than that automation is going to be huge and effective. We should have to welcome the automation in all sectors because automation is a thing which gives confidence in results. Automation has become a boon but it should have to monitor carefully and use efficiently then it will be more advantageous. Our proposed system contributed to form an open source, low-cost, effortless system which can be done by interacting the open source Arduino microcontroller with input devices. It can be anything such as smart phone, laptop, etc. which will forge ease to drive anything automatically. There are various steps which are carried out in the working of our proposed system firstly Arduino is interacted with the smart phone and the system constituted to function with devices in a well-equipped place. In our paper, we have mentioned an automation system which makes use of speech commands ordered by a user to monitor various devices for these we have to use an AMR voice app for voice recognition.

**Key Words** — Arduino, AMR voice app, Smart Phone

## I. INTRODUCTION

Day by day we are developing ourselves and our surrounding to getting called ourselves developed one. Many years ago, when the technology comes to existence that is when the first computer is developed no one even has thought that the device can be controlled by voice commands. This was just a supposed in science fiction however through our desire our passion to be developed we are using voice interfacing. As we know that voice transmission is the very efficient way of communication with less endeavor, ideas can be explicated and executed easily. In the current scenario, electricity stringency is one of the major issues that we are facing in our day to day life. It can be severe in future if we didn't concentrate on it in present condition. As we know resources are not available in large amount so we have to use it according to need and conserve it for future use because if we waste it, it will expire soon and everything will be useless. So to overcome this situation a system is proposed which will work only when it has to be used, otherwise, it will be switch power saving mode. Controlling or switching devices which are located far away from the user is might be difficult so we developed our proposed system up to this extent that it can be operated from a distance through a voice. Due to the addition of this feature, our system becomes so helpful and efficient at a low-cost budget. This might be the best way to conserve energy and save power. Many methods have been introduced to achieve the above goals

but here is the system which is capable of achieving all goals of a perfect system.

## II. LITERATURE REVIEW

Automation is not a new concept, it has been in used for so many years so there are lots of research papers and journals already published on automation. As technology is being advanced day by day the field of automation is also increasing rapidly. There are so many systems which have been introduced such as Wi-Fi, cloud, wireless sensor, Android, GSM, and IOT based. The earlier systems which have been introduced are as follows.

Lun-Wu Yeh, Ming-Hsiu Hsu, Hong-Ying Huang, Yu-Chee Tseng [1] designed and implemented a self-guided robot based on RFID and Wi-Fi. They build an indoor mobile robot that can be used in home appliances. They had proposed a robot which is self-guided. The robot can determine its location as well as navigate to the location where it is ordered to and it can even roam into an area which is new to it, but it only moves on smooth floors, not on bumpy floors and can't even from one floor to another. As we know that RFID tags are installed to detect hurdles which are costly and complex

Dr.Pramod Sharma, Preeti Verma, Km. Bhoomika, Ravi Kumar, Saurabh Baghel [2] proposed a system of home automation using IR (Infrared sensor) and Arduino-nano single board microcontroller. Here author discussed the use of IR sensor in a remote i.e. IR sensor to automate home using Arduino-nano single board microcontroller. The proposed system does not have any limitations of network, coverage and any GSM network, However as they are using IR sensor, IR sensor requires line of sight(LOS) to communicate so this factor will limit their proposed system.

D.Baladhandabany, S.Gowtham, T.Kowsikkumar, P.Gomathi [3] designed a PLC based automatic liquid filling system. Here author mentions controlling the entire system by programming the PLC. PLC is considered as the heart of the system. The installation cost is very high and it is so complex.

Jay Kumar, Anshul Sengar, Mohit Kumar Sharma, Manoj Kumar Patel, Simant Rahul Singh [4] designed home automation system using Android via Bluetooth. They had proposed a home automation system using an Arduino board

with Bluetooth being remotely controlled by any Android OS smart phone. Bluetooth based home automation system gives complete control over home appliances as long as the user is in range of Bluetooth network. It has high communication rate, great security, and low cost, so it can be implemented as real time system.

### III. PROPOSED SYSTEM

After studying all above systems, we have designed a system that aims to monitor devices using Bluetooth module and Arduino. Our paper proposed a system in which the automation of devices is done with ease at a suitable distance with the help of Arduino and Bluetooth module. Bluetooth module is united with the Arduino which interacts or interlink the cell with Arduino. Arduino is programmed in such a way that monitoring of devices based on the data sent by smart phone to Arduino through Bluetooth interfacing module. The block diagram of our proposed system is as shown in figure 1.

*Android mobile*

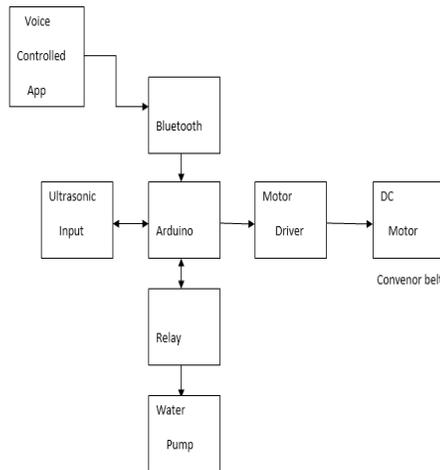


fig.1: Automation through voice recognition

Our proposed automation system is made up of the various components which are centrally control by Arduino. The Ultrasonic Sensor is used to detect the presence of bottle, D.C. Motor will be liable for impressive transfer of bottle by the means of conveyor system. Water tap will control the amount of liquid filling the bottle. The input and output display devices are executing as an interface between system and user. The entire system will be controlled by the Arduino unit. Required voice signals are provided through the internet activated Android phone. Again to convert the voice signal, we need a voice app like AMR voice app.

Voice commands send over the Arduino kit through Bluetooth. Bluetooth is used for the communication interfaced and Arduino. If we say anything through the mobile app, accordingly the signal will be generated through the Bluetooth. We can check those signals through the serial monitor.

In our system, if we said "Start" through the app then it will automatically turn ON the Motor and rotate the conveyor belt on which the bottle to be filled is placed. After some time

when this moving bottle comes closer to the refilling tap, then the ultrasonic sensor mounted on tap stand will detect a minimum distance. When Arduino kit receives any signal from an ultrasonic sensor, if the sensed value is less than the precise one then an automation will automatically stop and make the water pump ON to refill the bottle. It remains ON for next few seconds. As soon the bottle gets filled, the water pump will be OFF. And again the conveyor belt will start moving to pass on the filled bottle at another end. We can stop the system again by sending the signal "Stop" through the App.

### IV. RESULT

After completion of our proposed system, we are able to monitor it through voice commands. Simply a program has written and fed up for execution. Controlling devices through our voice commands is fully effective and enjoyable, enjoying our work makes the task easy and also boost up the energy level. So we came to know that our proposed system is very reliable, reduces efforts and makes life more convenient and fast.

### V. CONCLUSION

In our paper, the proposed method .i.e. Bluetooth based home automation using Arduino microcontroller has been discussed and its application for Bluetooth based automatic bottle refilling system using Arduino has been successfully demonstrated . Our proposed system has evolved an automation system using Bluetooth, Arduino and android phone. Our proposed system is very cost effective there is no need of maintenance or we can say that it is negligible. This proposed system is so user-friendly which was design to help for automation. This system has a centralized monitor system to control the operation and status of the devices. As compared to the conventional method the use of wire is drastically reduced.

This system helps to save time for the monitoring of the devices. The idea in our paper can expand or elaborate for automation of various application at large scale. However, this method is valid up to a specific range due to the limited range of Bluetooth module but we can further extend it by preferring some other methods as per need. The ultimate aim of our proposed system is to make us master of a world that we command by our voice.

### VI. FUTURE WORK

Lots of work has already done for automation on advancement. Day by day automation is having a great impact. Our proposed system is more reliable and inexpensive at the same time it is easy to implement. In future, we can make it more accurate and we can extend it for fixing cap for the bottle and packaging of the bottle.

## REFERENCES

- [1]. Lun-Wu Yeh, Ming-Hsiu Hsu, Hong-Ying Huang, Yu-Chee Tseng "Design and implementation of a self-guided indoor robot based on a two-tier localization architecture", Journal pervasive and mobile computing, Volume 8 Issue 2, April 2012, Pages 271-281.
- [2]. Dr. Pramod Sharma, Preeti Verma, Km. Bhoomika, Ravi Kumar, Saurabh Baghel "Home Automation Using IR (Infrared) Sensor & Arduino-Nano Single Board Microcontroller", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol. 6, Issue 3, March 2017.
- [3] D. Baladhandabany, S. Gowtham, T. Kowsikkumar, P. Gomathi "International Journal of Computer Science and Mobile Computing", Vol. 4, Issue. 3, March 2015, pg. 684 – 692.
- [4] Jay Kumar, Anshul Sengar, Mohit Kumar Sharma, Manoj Kumar Patel, Simant Rahul Singh "Home automation system using Android via Bluetooth", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol. 6, Issue 4, April 2017.
- [5] Pawan Singh, Krupa Chotalia, Sanket Pingale, Sandhya Kadam "smart GSM based home automation system", International Research Journal of Engineering and Technology, Volume: 03 Issue: 04, Apr-2016

## AUTHOR'S PROFILE

Mr. Mukesh K. Kanjare is currently studying his B. E from Mauli College of Engineering and Technology, Shegaon affiliated to SGBAU, Amravati. His area of interest is Automation, Biomedical, Embedded and Robotics.

Ms. Nishigandha S. Unhale is currently pursuing her B. E from Mauli College of Engineering and Technology, Shegaon affiliated to SGBAU, Amravati. Her area of Interest is Embedded and Biomedical.

Prof. Rahul R. Ambalkar is currently working as an Assistant Professor in Electronics & Telecommunication department of Mauli College of Engineering & Technology, Shegaon. Till date, he has 11 Internationals and 4 National publications on his name. His area of Interest is Embedded System