

DOMOTICS

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Introduction:

Home automation began to increase in popularity in the late 1990s and early 2000s as internet technology developed fast and smart homes suddenly became a more affordable option. Domestic technology or 'domotics' was a highly discussed topic as domestic appliances were being combined with computers.

The Internet of Things (IoT) can be viewed as connecting everyday objects like Internet enabled TVs, smart- phones, actuators and sensors to the Internet. The devices are smartly linked together allowing new forms of communication between people and things, and among things themselves. IoT technology has advanced significantly in the last few years since it has added a new dimension to the world of communication and information technologies. It's predicted that the number of devices connected to the Internet will increase from 100.4 million in 2011 to 2.1 billion by the year 2021, this growth is at a rate of 36% per year. In the year 2011, 80% of machine to machine (M2M) connections were made over mobile networks such as 2G and 3G and it is believed that by 2021, the ratio will increase to 93% since the cost related with machine to machine over fixed networks are generally more expensive than mobile. Different appliances and devices in the home such as air conditioning, lighting, entertainment systems and home security can now be connected to the Internet in order to allow the user to control those remotely using Tablets or Smartphones. Not only can devices be controlled, but the home environment can also be continuously monitored for keeping track of energy consumption or maintaining.

Objectives:

1. The main objective of the functions is to improve the quality of life and convenience in the home.
2. Other goals are greater security and more efficient use of energy thanks to connected, remote-controllable devices.
3. Home appliances, such as the washing machine, lights or the coffee maker, can be time-controlled.

4. Managing all of your home devices from one place.
5. The convenience factor here is enormous flexibility for new devices and appliances.
6. Maximizing home security. Remote control of home functions.
7. Increased energy efficiency.
8. Improved appliance functionality.
9. Home management insights.

Methodology:

Materials

Arduino Uno: It is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, simply connect it to a computer with a USB cable.

Power Supply: The system requires +5V DC power supply for its operation. In this work, two 9V DC batteries connected in series are used as a power source to the robot system.

Ultrasonic sensor: which is used for smart dustbin. In the design of the robot, we are using ultrasonic sensors for obstacle detection and avoidance. The ultrasonic sensors continuously emit the frequency signals, when an obstacle is detected these signals are reflected back.

Relay:-Relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals

Servo motor: A servo motor is an electromechanical device that produces torque and velocity based on the supplied current and voltage. A servo motor works as part of a closed loop system providing torque and velocity as commanded from a servo controller utilizing a feedback device to close the loop.

Method

The project proposes automatic home automation that has intelligence built in such a way that it directs itself whenever the sensors pass the signals. This project is built using a microcontroller of the ATmega 328 family.

Proposed Work

In order to address the mentioned issues of functionality and flexibility, we designed and implemented a standalone, novel, flexible and low cost home monitoring and controlling system using Arduino uno.

The given home automation system has the ability to control the following components in the user's home:

1. Lights on/off
2. Fan on/off
3. Automatic Door Lock
4. Smart Dustbin

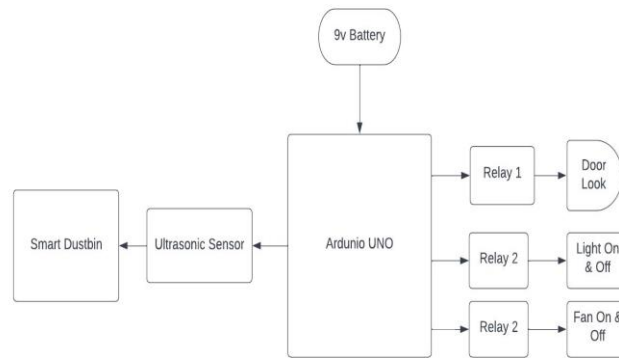


Fig 1. Block Diagram

Conclusion:

The project is designed to build a home automation using iot for the automation of Light, Door lock and Smart dustbin in home. These appliances were successfully controlled remotely through the internet. The designed system instigates a process according to the user’s requirements, for example switching on a fan when it gets hot. Sensors can be implemented to store data which can later be used to analyze the system at hand.

Scope for future work:

The smart home is moving toward smaller-sized, lower-power, longer-range sensors and IoT devices to track and provide updates when things may look out of the norm, like when there's a leak, for example. Not everything will require short-range, uninterrupted, high-frequency connectivity and it means that data in the smart home truly becomes "everywhere."We will continue to see solutions that derive benefit from a constant "pulse" of data small packets of information that move very quickly and amount to a large impact versus high-bandwidth data dumps. Amazon Sidewalk's smart neighborhoods and Helium's expanding P2P wireless networks are new innovations built on this principle.

Automation is not just a word but a requirement of everyone in the future. Technology made it possible to control your home appliances with the help of mobile application or voice assistants. People in India are quickly adopting this technology but still, this technology is new for most people. You can set timers or run schedules on your appliances once you have made them smart, like turning on geyser at 7am automatically or turning on balcony lights at 8pm when it is dark every day. These devices will automatically run these commands according to the pre-defined schedules. This will be a revolution in the future to change simple homes into smart homes to make consumers more comfortable and add convenience to their life. Home automation will even help make your home secure as homeowners will be notified on their phone about any unusual activity in their smart home. Also, it will help homeowners to recognize who is ringing their home bell from the comfort of their phone. And, they can even lock and unlock the door according to their preference. In short, home automation has a huge scope in the future. Everyone will opt for this technology happily because of the energy saving behaviour and more security accessibility features of smart homes.