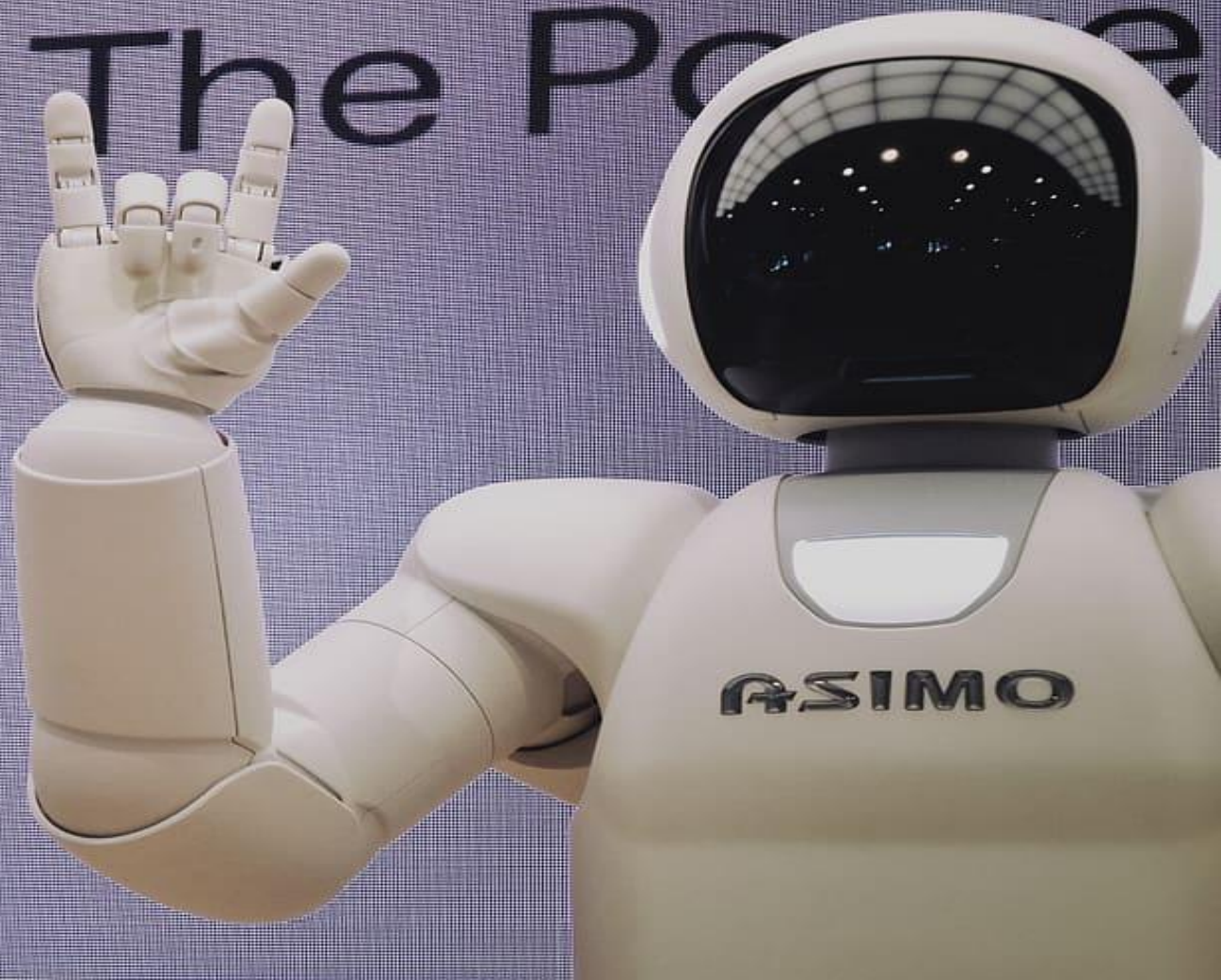Proposal
For
Exhibiting
In
The
SET
Exhibition

Project Made With

ARDUINO
PROGRAMMING

Project Idea:
Automated Mini City

Mini City

- Light sensitive street lights
- Timed Traffic Lights
- Smart Homes
- Cars that drive the City streets

Arduino

4-WAY TRAFFIC LIGHT SYSTEM

4-Way Traffic Light System

<u>Introduction</u>

- Today traffic congestion is one of the biggest problem in major cities of the world.
- This problem can't be solved by introducing traffic police at every junctions.
- But it can be solved by implanting Automated Traffic Light System at various junctions that can be monitored continuosly at the headquarter through CCTVs.

4-Way Traffic Light System

- Using 3 LED's (red, yellow and green) build a traffic light that
  - Illuminates the green LED for 5 seconds
  - Illuminates the yellow LED for 2 seconds
  - Illuminates the red LED for 5 seconds
  - repeats the sequence

- Note that after each illumination period the LED is turned off!

4-Way Traffic Light System

- Design the traffic light System for 4-way Junction.

- Make the Green Light ON for vehicles of any of the 2 ways while that of the other 2 ways should be Red simultaneously.

- Make the Green Light for Footpath ON of those 2 ways whose vehicle signal is Red and that of the other 2 ways should be Red simultaneously.

Benefits And Future Scope

- Control up to **4-phases traffic system** with the traffic optimization strategies.

- **Optimize the traffic flow** at network junctions.

- Measurably **improve traffic flow** .

- **Reduce environmental pollution** caused by traffic.

- Most importantly **increases road safety.**

- Save considerable **Amount of Time.**

- No need of **Traffic Instructor** at the Junction.

AUTOMATIC STREET LIGHTS

Introduction

➢ Reducing the wastage of Power.

➢ LDR is very useful in Light/Dark sensor circuit as normally the resistance of a LDR is very high as about 100000 Ohms.

Working

❖ Light falls on LDR and its minimum resistance voltage drops across LDR less than the voltage of transistor so light will go from the collector to the emitter and transistor remains off.

❖ It automatically turns the lights ON when the goes beyond the visible region of our eyes.

COMPONENTS

- **Arduino UNO R3**
- **LEDs**
- **LDR**

CONNECTIONS

- LDR

  Vcc ==> A0

  Gnd==> Gnd

- LEDs

  Vcc ==> 13

  Gnd ==> Gnd

Benefits And Future Scope

- No man power required.
- Simple Construction.
- Efficient method.
- Less Consumption of energy.
- Less maintenance.
- Cheap and economical.
- Easy for night.

Disadvantages

- Limitation of Power.
- Light turns ON when shadow falls on LDR.
- LED is a low voltage device.

Conclusion

In coming days, this will be going to be a boon to the country, since it will save a lot of energy of the power plants that gets wasted in illuminating the street lights.

As a result, about **77%-81%** of power consumption can be reduced by using this system towards providing a solution for energy saving.

SMART
HOME

COMPONENTS

Intruder Alert System

1. Arduino UNO R3
2. Ultrasonic Sensor
3. Buzzer

Smart Door Lock System

- Arduino
- Bluetooth Module HC-05
- Servo Motor
- Door Lock

CONNECTIONS

Intruder Alert System

Ultrasonic Sensor

Vcc ==> 5V

Trig ==> 10

Echo ==> 9

Gnd ==> Gnd

Buzzer

Vcc ==> Pin 2

Gnd ==> Gnd

Smart Door Lock System

Bluetooth Module

- Vcc = 5v
- Gnd = Gnd
- Tx = Rx
- Rx = Tx

Servo Motor

- Vcc = 5v
- Gnd = Gnd
- OutPin = Pin 9

Smart Door Lock System

INTRODUCTION

❖ Security describes protection of life and property. The safety in the house is very important. Besides the traditional method door that used a key can be easily open by not authorized person or burglar if they have the right key. This will allows them to steal the entire valuable thing in the house.

❖ Nowadays the telecommunication technologies become wider and more new features exist to make human life better This project will use an bluetooth feature in mobile phone to automatically open the door so that bluetooth technology syncs your phone directly with the lock .

❖ It will automatic open if authorized person is detected. The door will open for a certain delay and the door automatically closes within this time.

Benefits And Future Scope

★ Secure

★ Simple and Easy to access

★ Control of door and windows from anywhere

★ Faster operation and efficient

★ Can be used in Garages, office, schools, home, industries

★ Even differently abled people can use this system to control locks, windows and doors.

★ Strict control of in/out.

★ Smart ways of accessibility

<u>Introduction</u>

- It is an alarm system that makes a loud noise on any unauthorized entry occurs in the restricted areas.

Benefits And Future Scope

- An unmanned security system that will be able to **detect intruders.**
- Could offer an **easy connection** to the internet for remote monitoring.
- **Target Audience:** Personal Home Security or Large Scale Business Activity.
- The alarm system devices can be disconnected and installed at different places. It is **easy to relocate** wireless systems.
- **Cheap** and Economical.
- Ensures **Safety.**
- Prevents from **theft.**

Disadvantages

- These security systems are prone to **false alarms** that involve the alarm ringing when anyone from your family enters the restricted area. Or there are instances when the alarm is triggered by itself without any reason.
- Irrespective of the type of burglar alarm you have, it can be **stolen** from the site where it is installed. Wireless systems are comparatively easier to disconnect. Some burglars can easily disconnect the wired alarm systems.

ADVANCED VEHICLES

COMPONENTS

Bluetooth Controlled Vehicles

- Arduino
- Smart Car Set
- Motor Driver (L293D)
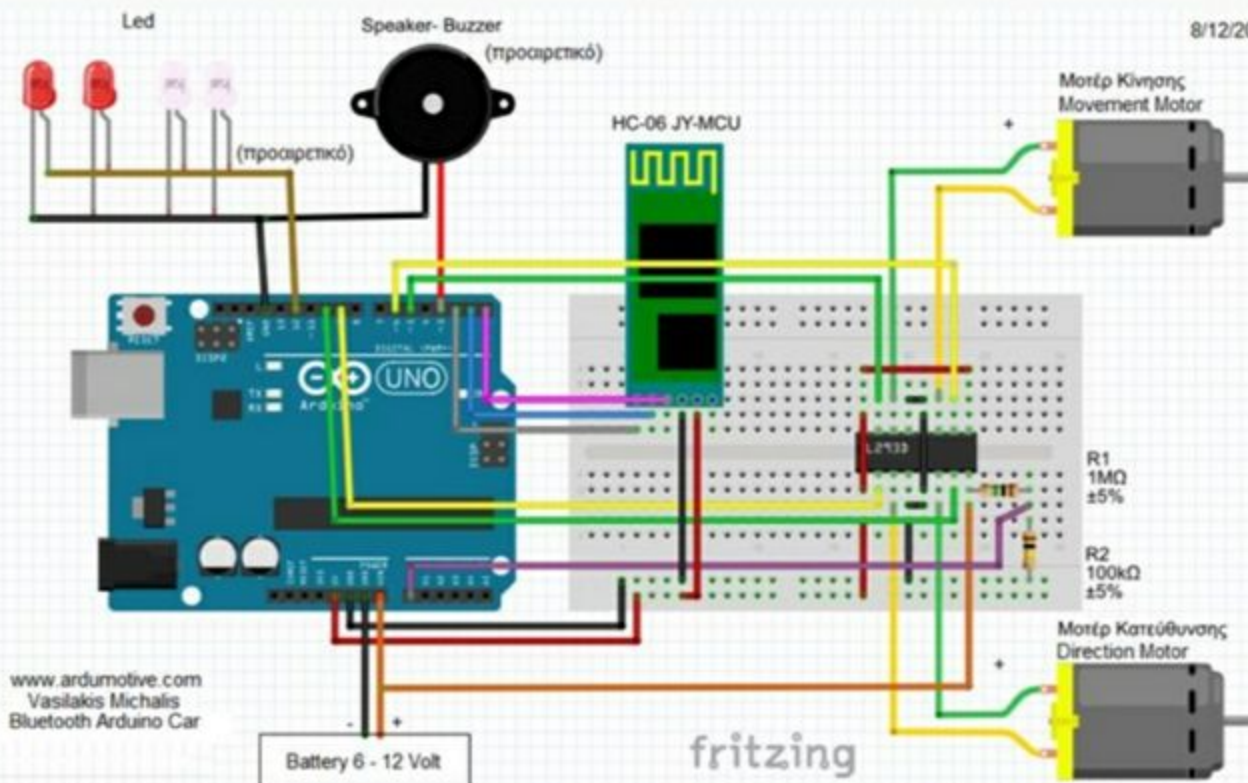- Bluetooth Module (HC-05)
- LEDs
- Buzzer

Obstacle Avoider Vehicles

- Arduino
- Ultrasonic Sensor
- Motor Driver (L293D)
- LEDs
- Buzzer

Bluetooth Controlled Vehicles

Introduction

In this project we are going to prepare a Robo using Arduino. Its a car that will be operated with your android phone as a remote. In this project several instruments are used but the most specific is Arduino which works as the brain of the whole system.

Led

Speaker- Buzzer
(προαιρετικό)

(προαιρετικό)

HC-06 JY-MCU

Μοτέρ Κίνησης
Movement Motor

8/12/2014

UNO

L293D

R1
1MΩ
±5%

R2
100kΩ
±5%

Μοτέρ Κατεύθυνσης
Direction Motor

www.ardumotive.com
Vasilakis Michalis
Bluetooth Arduino Car

Battery 6 - 12 Volt

fritzing

Obstacle Avoider Vehicles

WORKING

❖ The obstacle avoidance robotic vehicle uses ultrasonic sensors for its movements. Arduino is used to achieve the desired operation.

❖ The motors are connected through motor driver IC to Arduino. The ultrasonic sensor is attached in front of the robot.

❖ Whenever the robot is going on the desired path the ultrasonic sensor transmits the ultrasonic waves continuously from its sensor head.

❖ Whenever an obstacle comes ahead of it the ultrasonic waves are reflected back from an object and that information is passed to the arduino uno.

❖ The Arduino controls the motors left, right, back, front, based on ultrasonic signals. In order to control the speed of each motor pulse width modulation is used (PWM).

❖ When ultrasonic sensor detect the object which is kept inside the path it will send the signal toward the arduino uno and according to that it will rotate the motor.

❖ M3 & M4 in forward direction and rotate the motor M1 & M2 in reverse direction such way that the car get moving in left direction.

❖ Similarly in every time when ever an obstacle in found to be in path of car it will detect it and rotate the car in left direction to avoid the obstacle.

HOW ULTRASONIC SENSOR WORK
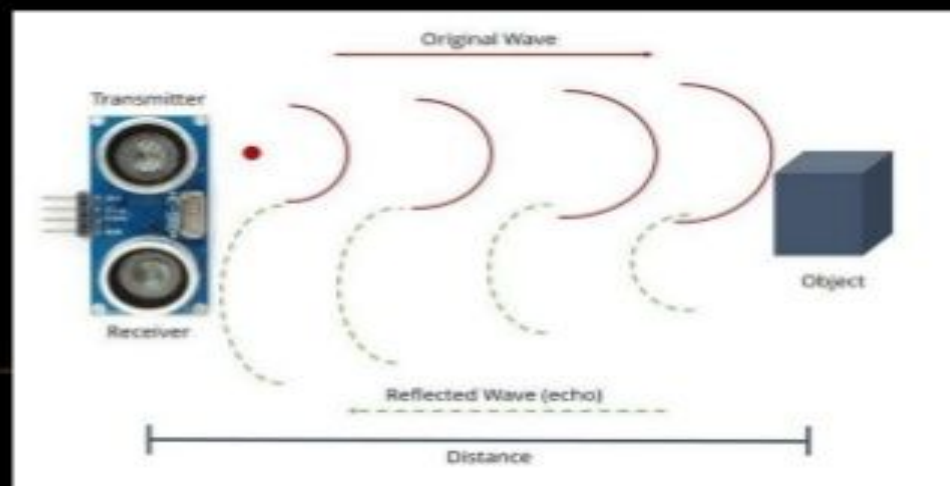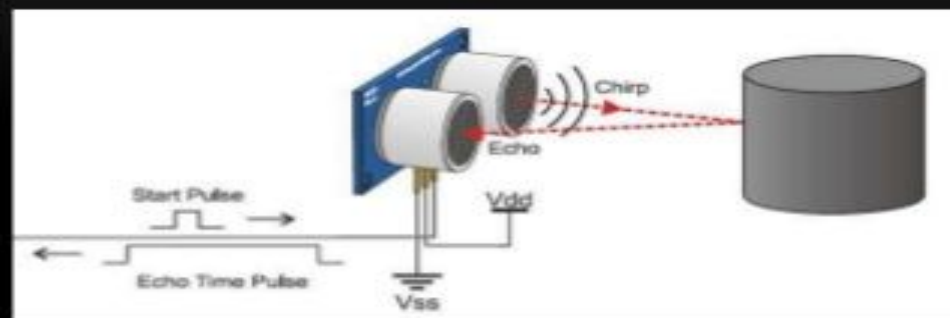
CONNECTIONS

Bluetooth Controlled Vehicles

Bluetooth Module (HC-05)

1. Vcc → 5V

2. Gnd → Gnd

3. Tx → Rx

4. Rx → Tx

Motor Driver (L293D Dual Motor Controller)

1. Vcc → 5V

2. Gnd → Gnd

3. In 1 → Pin 5

4. In 2 → Pin 6

5. In 3 → Pin 10

6. In 4 → Pin 9

- **LEDs**
  Vcc ⇒ 13
  Gnd ⇒ Gnd
- **Buzzer**
  Vcc ⇒ 11
  Gnd ⇒ Gnd

Obstacle Avoider Vehicles

Motor Driver (L293D Dual Motor Controller)

1. Vcc → 5V

2. Gnd → Gnd

3. In 1 → Pin 5

4. In 2 → Pin 6

5. In 3 → Pin 10

6. In 4 → Pin 9

Left Ultrasonic Sensor

1. Vcc → 5V
2. Gnd → Gnd
3. Trig ⇒ Pin 12
4. Echo ⇒ Pin 13

Right Ultrasonic Sensor

1. Vcc → 5V
2. Gnd → Gnd
3. Trig ⇒ Pin 10
4. Echo ⇒ Pin 11

- **LEDs**
  Vcc ⇒ 13
  Gnd ⇒ Gnd
- **Buzzer**
  Vcc ⇒ 11
  Gnd ⇒ Gnd

Benefits

Bluetooth Controlled Vehicles

1. Can be used as a **remote security device**.

2. Can be used in **examining mini – tunnels.**

3. Can be used in **search and find.**

4. Can be used in **home security or as a alert** at a time of any **environmental changes**.

5. Can be used for **search and rescue** and to explore **unreachable places.**

6. Can be used by **military** for **finding bombs or as a remote surveillance.**

Future Scope

Bluetooth Controlled Vehicles

1. Can be **controlled** by **phone's accelerometer sensor** to control the **car via movement of the phone.**

2. **Automation** of household tasks.

3. Can be used as **better security and surveillance** by implementing more functioning systems such as **alarm trigger system.**

4. Use **camera** to **transmit frames back** to android application.

5. Can be implemented using **Wi-Fi connectivity** as Bluetooth is of low bandwidth.

Benefits And Future Scope

Obstacle Avoider Vehicles

- ❏ Can be used as **Movable Surveillance System.**
- ❏ Can be controlled **Remotely.**
- ❏ Doesn't **requires manpower** to operate.
- ❏ Can be used for **Critical applications** like flood, bomb disposal, fire,terrorist attack, earthquake, etc.
- ❏ Automated **Lawn Mower.**
- ❏ Smart **Room Cleaner.**
- ❏ **Mobile Robot Navigation** system.
- ❏ Unmanned **Driving** systems.
- ❏ **Mining Vehicle** that uses **Obstacle Detection.**
- ❏ Can be used in **dangerous environments** where human entry may be fatal.

Team

1. Raunak Mishra
2. Ranjit Pandit
3. Bibek Kumar Thakur
4. Rahul Mandal
5. Rahul Ranjan Sah