# XANANOIDS

XANANOIDS, the club by robotic people, is the group of students who works and are interested in the field of robotics. It was founded in 2004. Since the beginning, students of this club are developing various educational robot, with this, the members of this club are taking participation and winning various titles and awards at different IITs, NITs, ABU ASIA-PACIFIC ROBOCON CONTEST and various regional institutions.

Objective of the club is to deal with the behaviour based robotics i.e. cooperation and communication between robotics, also the main idea behind the formation of the club is to develop cost effective educational robotic platform for students. Also, the club members are focusing on the development of hybrid locomotive robot and gyro stabilizes biped robot.

Currently, the club has a team of 40 members. All the members are engineering students of various branches from different semesters and working on development of various industry level projects. Also, the members are currently focussing on, with the research in Service robotics and Automation. The members have already developed various projects on different technologies related to robotic field.

As the world is growing with the new technologies every day, the members of this club are also learning to grow with immense knowledge in this field.

This club not only deals with the theoretical knowledge but also with the practical implementation of the knowledge. The members here, not only learn but they implement, then they modify and introduce something new and something out of the box.

### 1. Black: (Bluetooth controlled robot)

Robots are always a fancy topic for students, hobbyists and DIYers. If you are beginner, then building a robot (like a car or an arm) is probably one of the important projects to do after learning about the basics.

The robot chassis which I am using in this Bluetooth Controlled Robot Car project is supplied with 4 geared motors. Since L298N has slots for only two motors, I have joined the left side motors as one set and the right side motors as other set and connected both these sets to the output of L298N Module.

### 2. Fire Fighter Robot

Fire Fighter is a robot which can remotely penetrate a zone of blazing fire and to a large extent extinguish it. It's also capable of rescuing two people(80kgs each)from the zone. It provides live feed from the site so that the operator can navigate the robot to rescue people as well as extinguish fire .
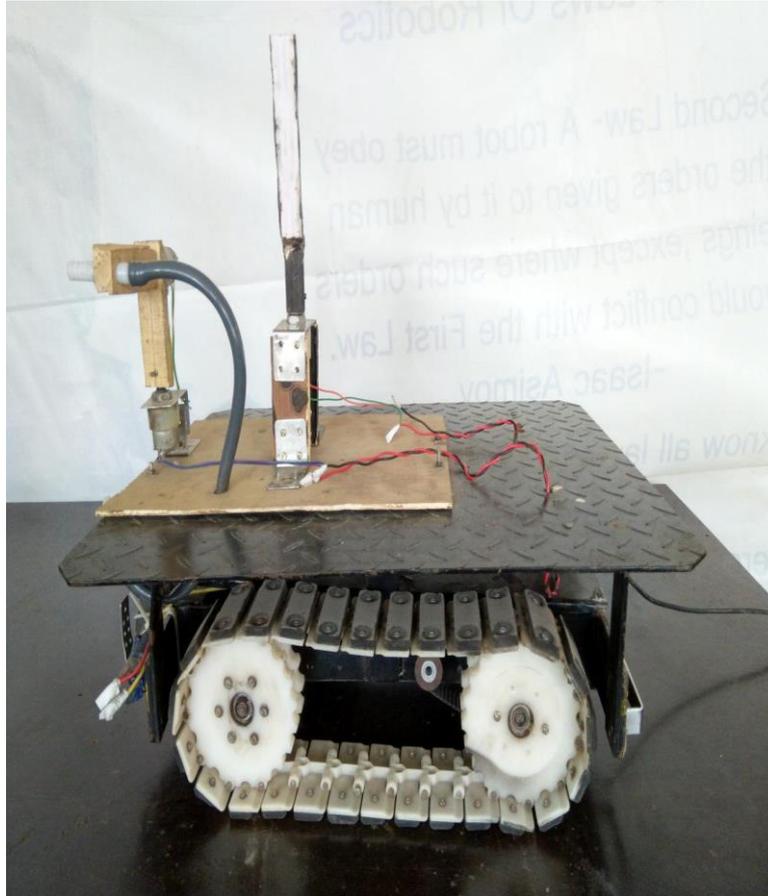
2. **Fire Fighter Robot**

- Mechanical designing and manufacturing team
- Parts assembly team
- Electronics team
- Programming team
- Image sensing team

Each team have completed their most of research and virtual work. Like mechanical designing team has completed its simulation and whole mechanical designing in designing software and also they have prepared all the specifications and calculations required for motors, hydraulics and parts.

Also electronics team have selected the electronics board, sensors and designing of this project. Image sensing team has completed its 70% work.

**Future Planning-**

We plan to extend the prototype version to a fully fledged product which can be utilized in the for-mentioned task.

**Applications-**

- It shall be highly beneficial in terms of preventing human losses in fire fighting.

- To detect the exact direction of the fire source .
- Capability of sensing accurately with increased flexibility .
- Reduce human effort.
- Reliable and economical.
- Not sensitive to weather conditions.

## 3. Lab Automation using IoT and Arduino

In this project all the appliances i.e. lights and fans and doors of a room can be independently operated via an Android app or a web server.
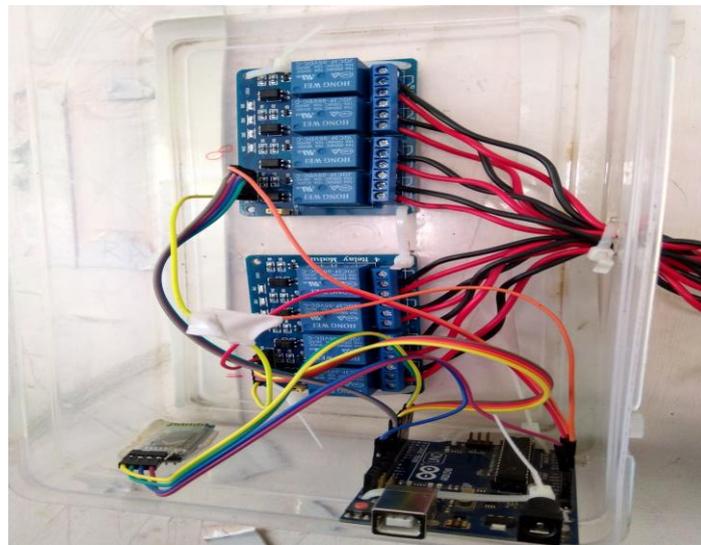


**4.Lab Automation using IoT and Arduino**

**Current Status-**

A lab automation system will control lighting, climate, entertainment systems, and appliances. The user interface for control of the system uses either wall-mounted terminals, tablet or desktop computers, a mobile phone application, or a Web interface, that may also be accessible through the internet.

**Future Planning-**

We plan to extend the prototype version to a fully fledged product which can be utilized in the for-mentioned task. We plan to include image processing, face detection, and finger print sensor.

**Applications-**

- To control the electronic devices i.e fans,lights and doors wirelessely using mobile and server.
- For the purpose of security enhancement and attendance.

**Technical Events Details of Session 2018- 2019:**

1. ## Game of Drones :

This event was held on 17th March, 2019. In this event participants were asked to build a drone to travel from source to destination by crossing various interruptions, hurdles, etc., along with the path of the journey. There were total 40 students In-house and from different colleges in it. The event was judged by the honorable Shri. Saurabh Sharma , Co-Founder, Techienest Pvt Ltd , Jaipur.

Winner: Devnath From Xenon
Faculty Coordinators: Ms Shruti Kalra and Mr. Ashish Sharma



**1.Game of Drones**

2. ## Robo-Soccer:

This event was held on 17th March, 2019. In this event two teams again competed with each other and each team had two robot cars, one Defender and one striker. In the first round, teams had to throw the balls of one's area into the others areas using their bots. In the second round the defender robot had to defend the ball from entering the goal post and striker robot had to do the goals. The event was very interesting because of the enthusiasm and competitive spirit of the participants. The event was judged by Mr**. Dr. L. B Dubey , BMIT college.**
Winner : Darshan Upaddhay from Xenon
Faculty Coordinator:Mr. Vikas Sharma and Ms. Deepmala
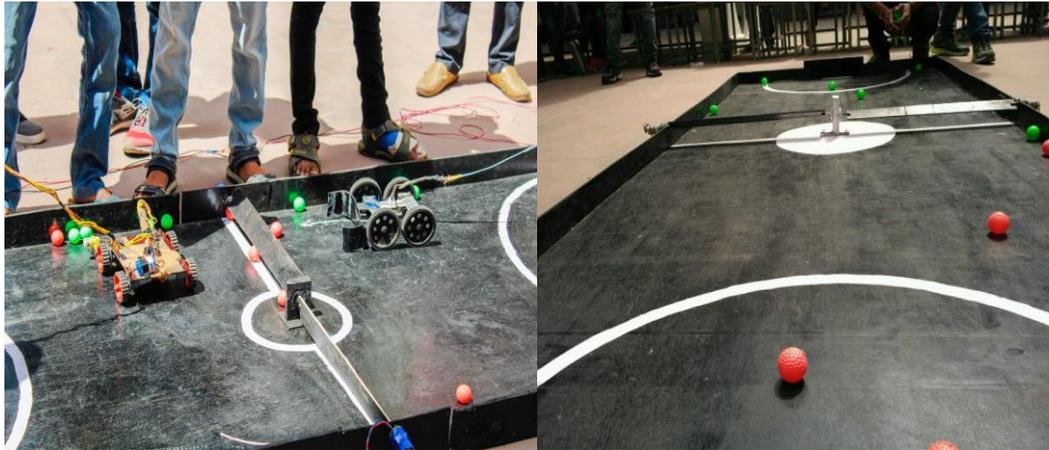
**2.Robo-Soccer**:

## 3. Robo Race:

In this event, robots were made to cross many hurdles and complete the race in minimum time. The team which crossed all the hurdles in minimum time with maximum points and efficiency was announced as the winner. The winner team was from SKIT , Jaipur and the runner-up team was from SKIT Jaipur. The event was judged by **Dr J.P. Agrawal ,Professor, JNIT, Jaipur.** and the event was held on 16th March, 2019**.**

Faculty Coordinators: Ankur Gangwar and Ms. Neha Singh.



**3.Robo Race**

## 4. Line Follower:

In this event, the compact infrared light robot was made to move on white strips on blackboards using detector. There were 5 checkpoints on the LFR track from which a team could skip maximum 2 checkpoints. The team which completed the track in the minimum time with maximum points was announced as the winner. The winner team was from JECRC University and the runner-up team was from SKIT Jaipur. This

event was held on 18<sup>th</sup> March, 2019. The event was judged by: Dr. Dinesh Sethi, Professor,(JU)

Winner : Harsh Raj, Smit Mistri

Faculty Coordinators: Ms. Parul Tyagi and  Ms. Vinita Mathur
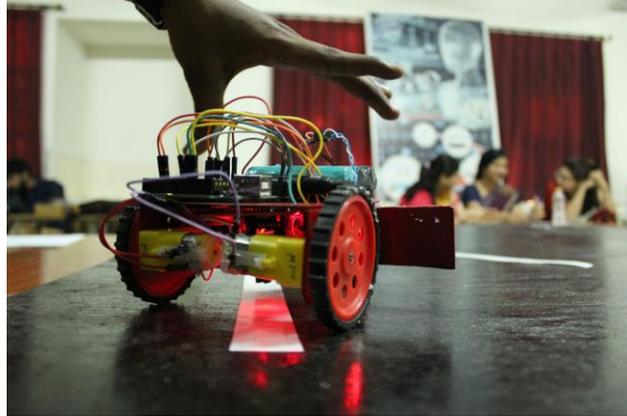


**4.Line Follower:**

## 5.  Robowar:

This event was held on 19<sup>th</sup> March, 2019**.** In this event, two teams competed among themselves. This event with three rounds attracted a huge audience. There were 72 teams participated, during the event many robots got destroyed.. The event was judged by - **Mr. Chandra Prakash Sharma** and Mr**. Nitin Chhabra**. Winner : Megatron

Faculty Coordinators: MR. Vikas Sharma and Mr. Devesh Gupta

## 6.  Sumo war:

Robot-sumo, is a sport in which two robots attempt to push each other out of a circle (in a similar fashion to the sport of sumo). The robots used in this competition are called sumo-bots. The engineering challenges are for the robot to find its opponent (usually accomplished with infrared or ultra-sonic sensors) and to push it out of the flat arena. A robot should also avoid leaving the arena, usually by means of a sensor that detects the edge.The most common "weapon" used in a sumo bot competition is an angled blade at the front of the robot, usually tilted at about a 45-degree angle towards the back of the robot. This blade has an adjustable height for different tactics.

This event was held on 18<sup>th</sup> March, 2019. The event was judged by: Dr Manisha Gupta, Professor,(JU) .

Winner:Chiron Botz

Faculty Coordinators: Ms. Parul Tyagi and  Ms. Vinita Mathur

# Some of our projects are here (2018-19):-

## 1. Robowar ( Ajay)

A Robot Which Works On The Concept Of Pneumatic And Load Bearing Capacity.

Robowar is a machine which was built to physically compete with others bots in the arena. It has pneumatic for throwing the bot out of the playing arena. It has six motors to travel throughout the arena. Three wheels in one side and other three at other side, which is recently controlled by remote.
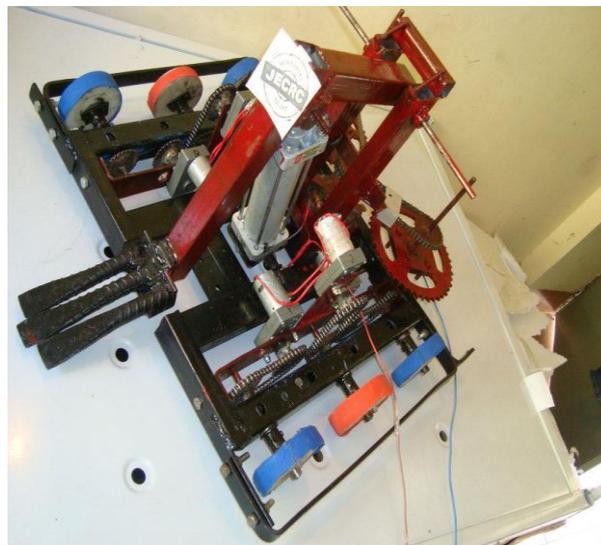


1.Robowar ( Ajay)

**Future Aspect:-**

1. For testing of materials in laboratories.
2. Can be used as a cutter.
3. Controlled by rf remote which can be controlled wirelessly.
4. It can be used to lift weight up to 100kg.
5. Use it as a transport vehicle for heavy objects.
6. Used as toeing van lifting mechanism.

## 2. Robowar ( TEJAS)

A Robot Which Works On The Concept Of .

Robowar is a machine which was built to physically compete with others bots in the arena. It has pneumatic for throwing the bot out of the playing arena. It has six motors to travel throughout the arena. Three wheels in one side and other Three at other side, which is recently controlled by remote.

2.Robowar ( TEJAS)

### 3. SPYBOT

The project is designed to develop a robotic vehicle using RF or Bluetooth technology for remote operation attached with wireless camera for monitoring purpose. The robot along with camera can wirelessly transmit real time video with night vision capabilities.
This is kind of robot can be helpful for spying purpose in war fields.



3. **SPYBOT**

**Applications:-**

1.It can be used to spy from a distance.

2.On the border area, it can be used by military, to observe the view of outer area while sitting in a closed room or cabin.

3.If wide camera is used, wide area can be observed.

## 4. Led Cube With 3d Visualisation

LED cube is like led screen, but it is special in that it has third dimension which makes it 3D. This LED cube will light up any party and has mesmerizing effect when light dazzle and dance in brilliant patterns in 3dimension. Principal behind the LED cube is persistence of vision. If we flash each layer of cube very fast one after another, it gives illusion of a 3D image and image will stay on our retina while after led turns off.
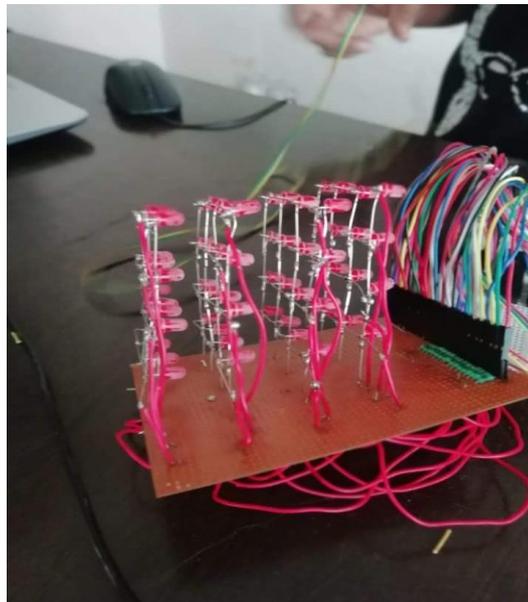


**4.Led Cube With 3d Visualisation**

**Future Planning-**

- Currently LED's applied in the cube are of low intensity so it requires dark to show its patterns and structures. Our aim is to replace all the LED's with high intensity LED's so it can works even in day light.
- Also we are going to make its dimensions 16x16x16.
- Making it wireless as initially patterns will be stored in it and now we will have to just give commands to it through our phones and it will draw patterns accordingly.

**Applications-**

- During lectures LED Cube can be used to draw crystal lattices as displaying students live demonstration make them curious and active in studies.
- It can also be utilized for making 3D projections of objects in research works like in medical sciences and also to make 3D structures of infrastructures for proper study of any weakness.

## 5. SBR (SELF BALANCING ROBOT)

This is a self-balancing robot on two wheels using MPU-6050 accelerometer based on Arduino.Self Balancing Robot is one such step which promotes that a robot should be able to have locomotion using the balancing capabilities just as the humans also possess.
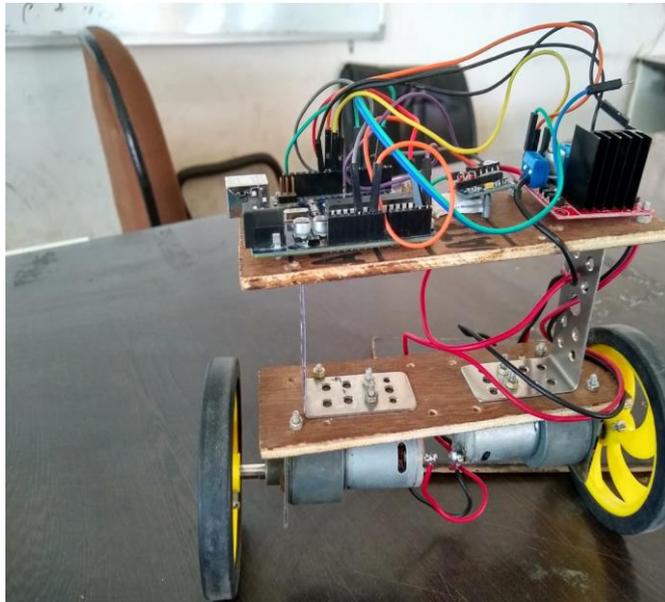


**5.SBR (SELF BALANCING ROBOT)**

**APPLICATIONS**

The purpose of our project is to balance a robot automatically using motors, sensors and a microprocessor. The use of a pair of motors is to keep the robot in the upright position by using an accelerometer and gyroscope sensors. This provides a classic inverted pendulum. Generally the accelerometer sensor is noisy, but they are accurate over a short period of time. By using the sets of results obtained from the sensors and the calculated results, it can solve the problem of the classic inverted pendulum, and therefore the robot can be kept in the upright position without falling down.

## 6. RF-ID Based Security System

Radio frequency identification is wireless use of electromagnetic fields to transfer data, for the purpose of automatically identifying and tracking the tags attached to the objects. The tags contains electronically stored information.



6.RF-ID Based Security System

**Future Planning-**

- Replacing the RFID system with biometric lock like fingerprint detector and face recognition.
- Initially all data is stored in EEPROM so replacing it with SD Card so that word copy of all data can be printed anytime according to requirement and also storing all data online to make it available anytime from any place.

**Applications-**

- Automatic Electronic Toll Collection System.
- Automatic books arrangement in libraries.
- Identification of cars in industries and running trains.
- Tracking all the goods being transported and Airport baggage tracking.

## 7. Line Following Robot

**What is a line follower robot?**

Line following Robot is a machine that can follow a path. The path can be visible like a black line on a white surface (or vice-versa) or it can be invisible like a magnetic field.

This technique can be incorporated into the Automated Guided Vehicles (AGV) for providing the easy way of operation. Generally, the AGV is integrated with the microprocessor and

computers for controlling its system. It also uses a position feedback system for traveling in the desired path.

In addition, the electric signals and RF communication are needed for communicating with the vehicle and system controller. Such awkward functions are completely not required in this line following robot, and it just uses the IR sensors to travel on the black lines.
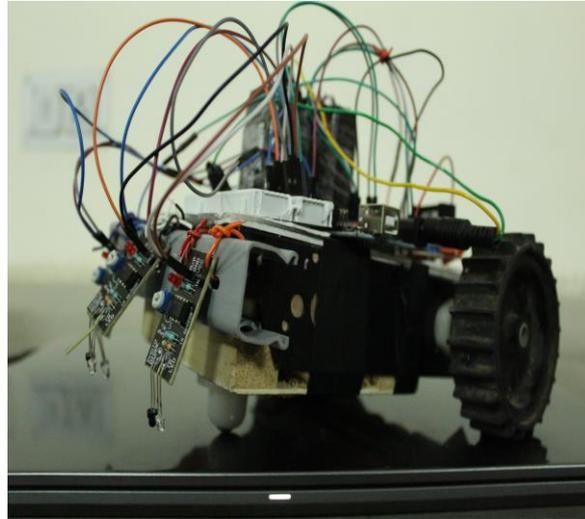


7.RF-ID Based Security System

**Why build a line follower robot?**

Sensing a line and maneuvering the robot to stay on course, while constantly correcting wrong moves using feedback mechanism forms a simple yet effective closed loop system.

As a programmer you get an opportunity to 'teach' the robot how to follow the line thus giving it a human-like property of responding to stimuli. Practical applications of a line follower: Automated cars running on roads with embedded magnets; guidance system for industrial robots moving on shop floor etc.

**Advantages of line following robot**

- Robot movement is automatic
- Fit and forget system
- Used for distance application
- Defense application
- Used in home, industrial automation
- Cost effective
- Simplicity of building
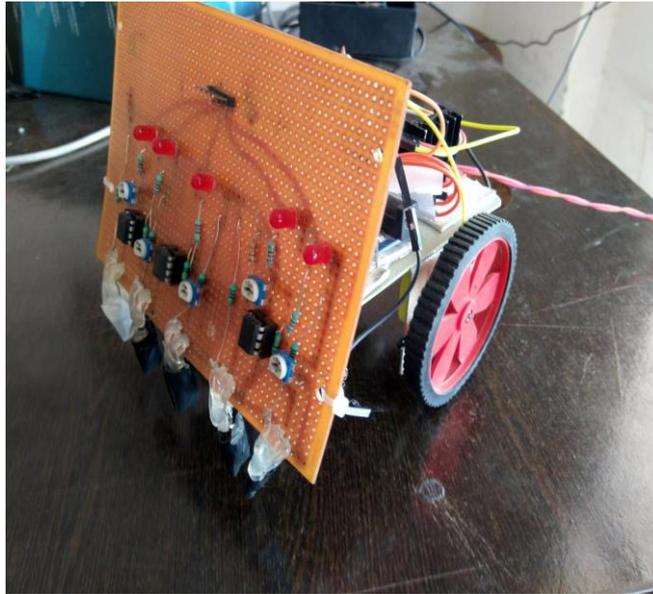
7.RF-ID Based Security System

**Modification/Future planning of our team**

- Micro mouse(compact line follower)
- Obstruction detection
- Edge avoider
- Wall following
- Controlling by mobile

**Applications**

- Guidance system for industrial robots moving shop floor etc.
- Industrial robots
- Home application
- Building and construction
- Transportation
-

## 8. <u>Grid Solver</u>

GRID SOLVER is an autonomous bot which work upon the principal of line following. It consist of LDR sensors and a micro controller of atmega16. This whole system work upon infinite coordinate solving algorithm. It is all new algorithm which is developed by our team. It is a unique algorithm which is widely applicable in industry. It can store last information about its location in the grid.

8. **Grid Solver**

**Future Planning-**

- Next step of this to apply arm processor to develop its efficiency.
- Applying wireless flashing to improve the algorithm according to grid.
- Mount a arm upon it and make it able for some predefined task.

**Applications-**

- Can be used in industries to increase the production capacity.
- Can be used with other robotic mechanisms as a base.

## 9. SMART-BIN

A bin like structure in which it detects the object coming on the opening and opens automatically for collecting unused and waste products. It works on the basis of the distance between object and bin through frequency.



9. **SMART-BIN**

**Applications:-**

1. Can be used in offices, institutions, and other places.
2. Can be used in hospitals due to its hygienic nature.

## 10.Transporter

It's a manually controlled bot. It can be controlled through Bluetooth and server.  It has a such type of belt drive mechanism through which it can climb on stairs and rough surfaces. It can be used for transporting heavy weights from source to destination.



**10. Transporter**

**Applications:**
1. It can be used to lift a object and deliver to another place.
2. It can be used in industries to lift the objects.
3. It can be used in various exhibitions.

## 11.Humanoid

It is a manually controlled bot which works on voice commands of human.

It has a camera which records the video and give a live update of the place on a server. We can recognize the face of individual through the face_recognition and also count the number of members present in the room through face counter.
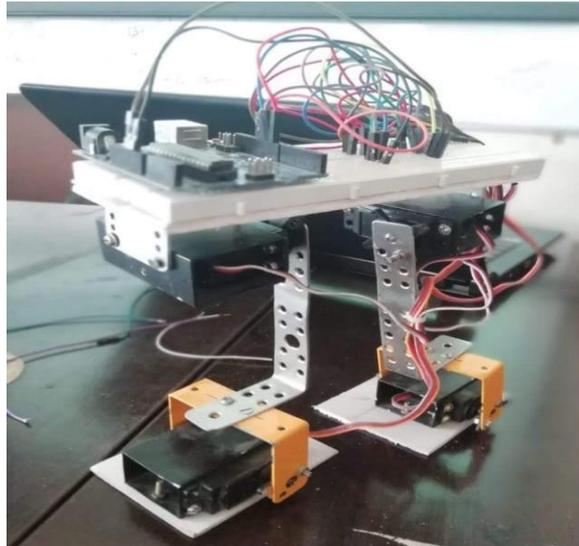
11.Humanoid

**Specifications:-**
1. Face counter
2. Face recognition
3. Voice recognition
4. Chatbot
5. Live feed

## 12.FaceCounter:

This counter is used to count number of human faces present in any area like parties, hall, and auditorium etc. So to keep track of number of guests. It can also be used in school and college classes for counting number of students present in classroom and automaton of classroom to save electricity as when no face will be detected electricity will automatically turned off.
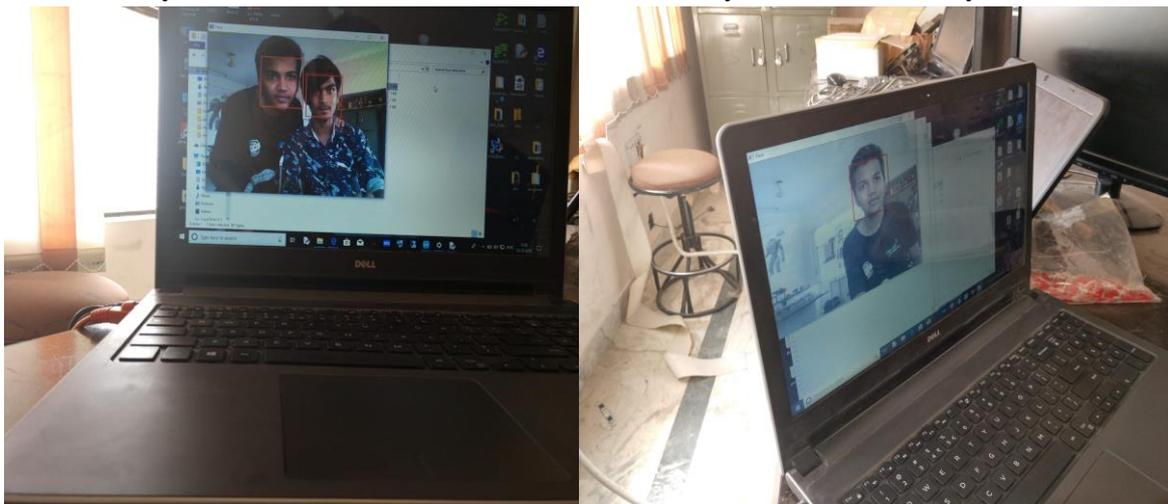

12. **FaceCounter:**

It will is further developed to make a face recognition program for automatic attendance system and to find any person in auditorium or any other place.