RoboVR

SRB BOWLING

About the game:

Bowling is a target sport in which the player throws a ball towards pins and points are calculated with respect to the number of pins toppled by the ball.

Similarly, the robot has to perform the same task and roll a ball towards the pins to gain points.

Components and its Specifications:

Sr. No.	Components	Specifications
1.	Chassis	Aluminum Sheet (5mm thick)
2.	DC Motor(x1)	60 rpm
3.	Johnson Motors (x4)	300 rpm
4.	BO motor	100 rpm
5.	Wheels(x4)	Off-road type
6.	Battery	5A, 12V
7.	Remote	With 3 DPDT switches
8.	Wires	8m-10m
9.	A hinge mechanism	-

Robot Details:

Robot Dimensions: 14” x 13” x 7”

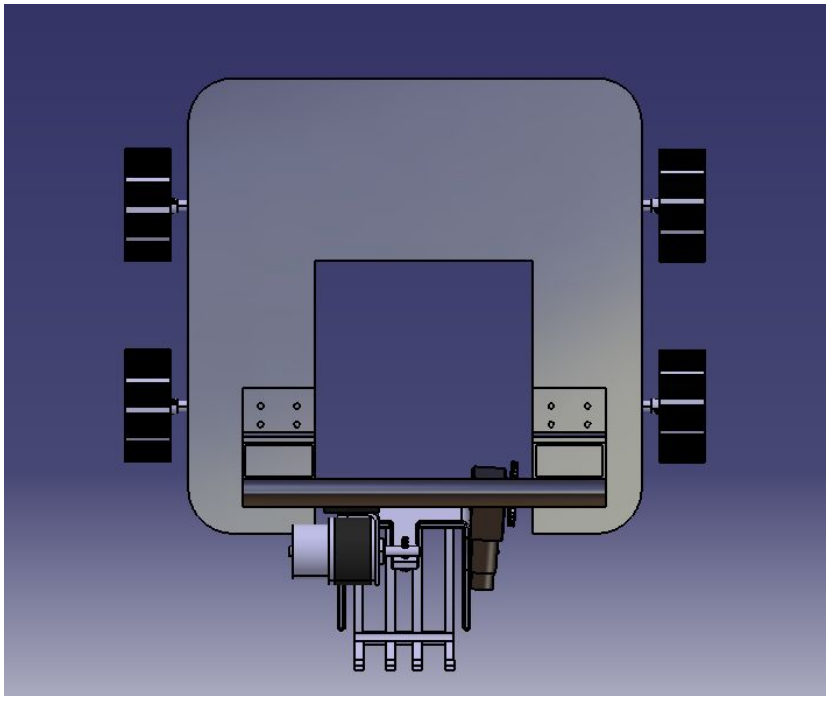
Robot Weight: 2kg

Robot Control: Wired

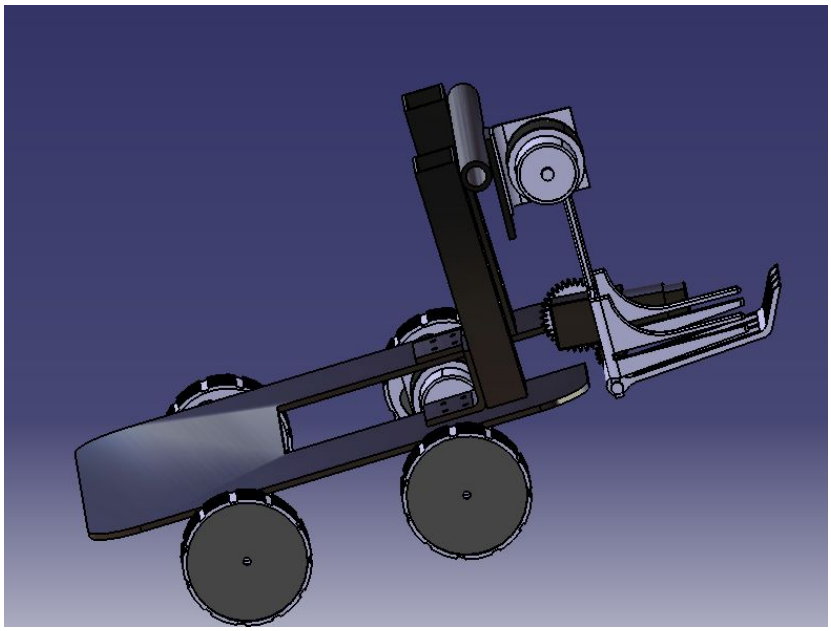
Robot Drive: 4 Wheel Drive

Mechanical Design:

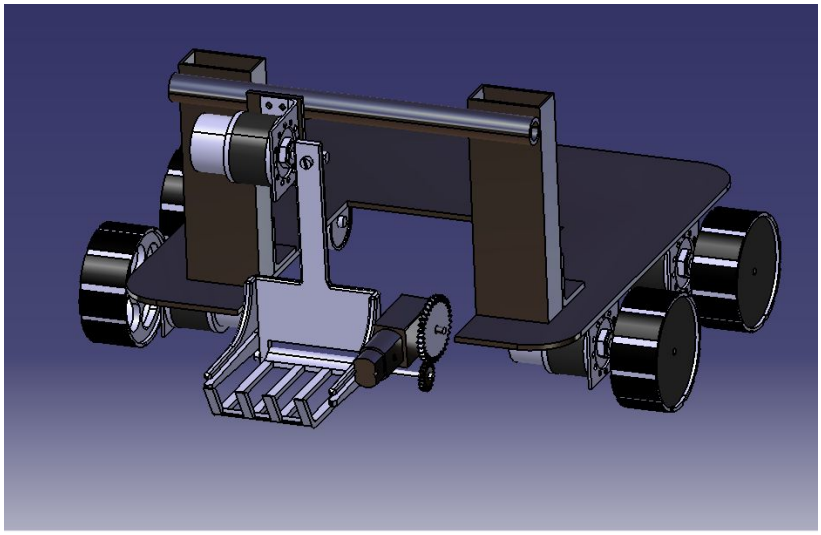
Top View



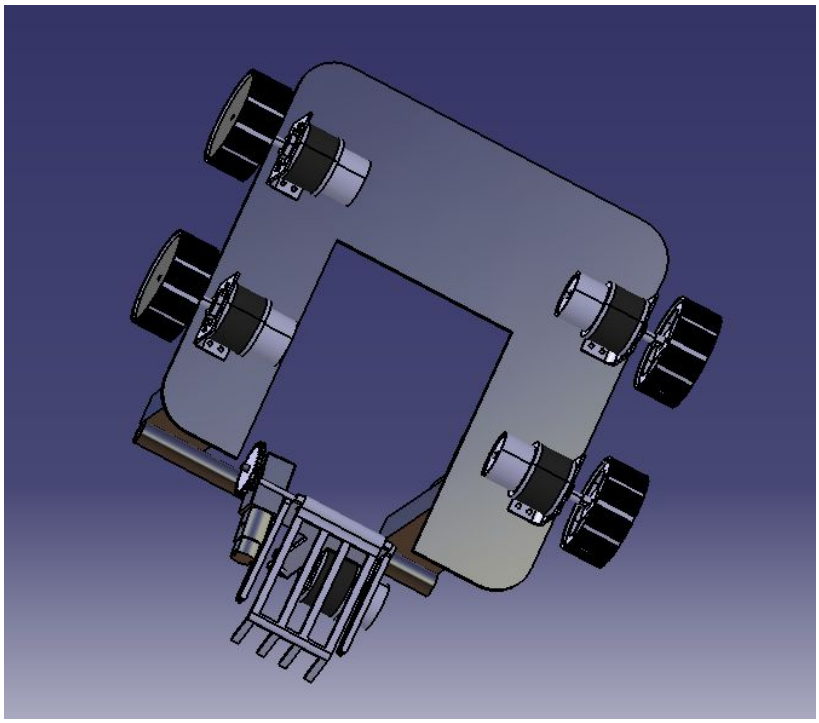
Side View



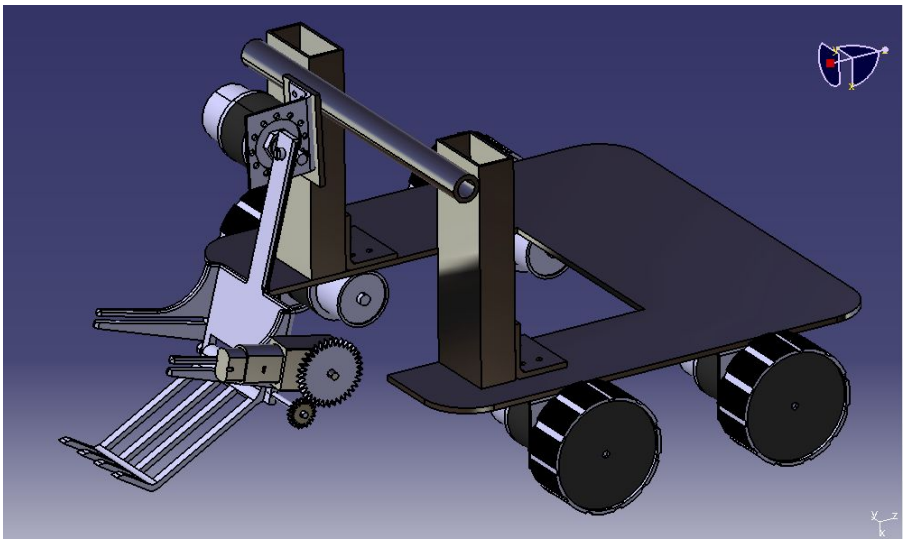
Front View



Bottom View



Fingers position when the ball is released

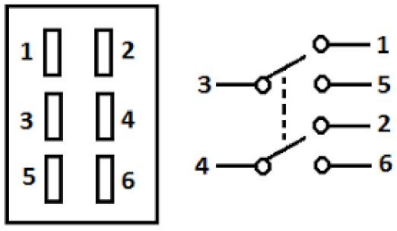


Remote Details:

A similar remote is needed to be built for this robot in which 4 DPDT switches are to be attached instead of 2 as shown in the above figure.

A Double Pole Double Throw (DPDT) switch is an electromechanical switch that has 2 inputs and 4 outputs and each input has 2 corresponding outputs that it can connect to.

Given below is the diagram of a DPDT switch.



Working:

The robot moves on 4 wheels with the help of the DPDT switches remote. To the robot, an arm similar to that of human is connected at the middle by a DC motor of 60 rpm. The movement of the arm is similar to that of human in which the motor represents the shoulder of a human. Another motor is used to release the ball from the hands. The previous motor is used to swing the hand to gain speed and then this motor is rotated to release the ball in the desired direction with the desired speed.

At first, place your robot in the position from where you want to throw the ball and load the ball into the hand of the robot. Back-lift the arm using the motor to generate the desired power and then press forward the DPDT switch and simultaneously use motor connected to fingers to release the ball and roll it through the track towards the pins.

The movement of the robot with respect to the switch operation are given below in the table.

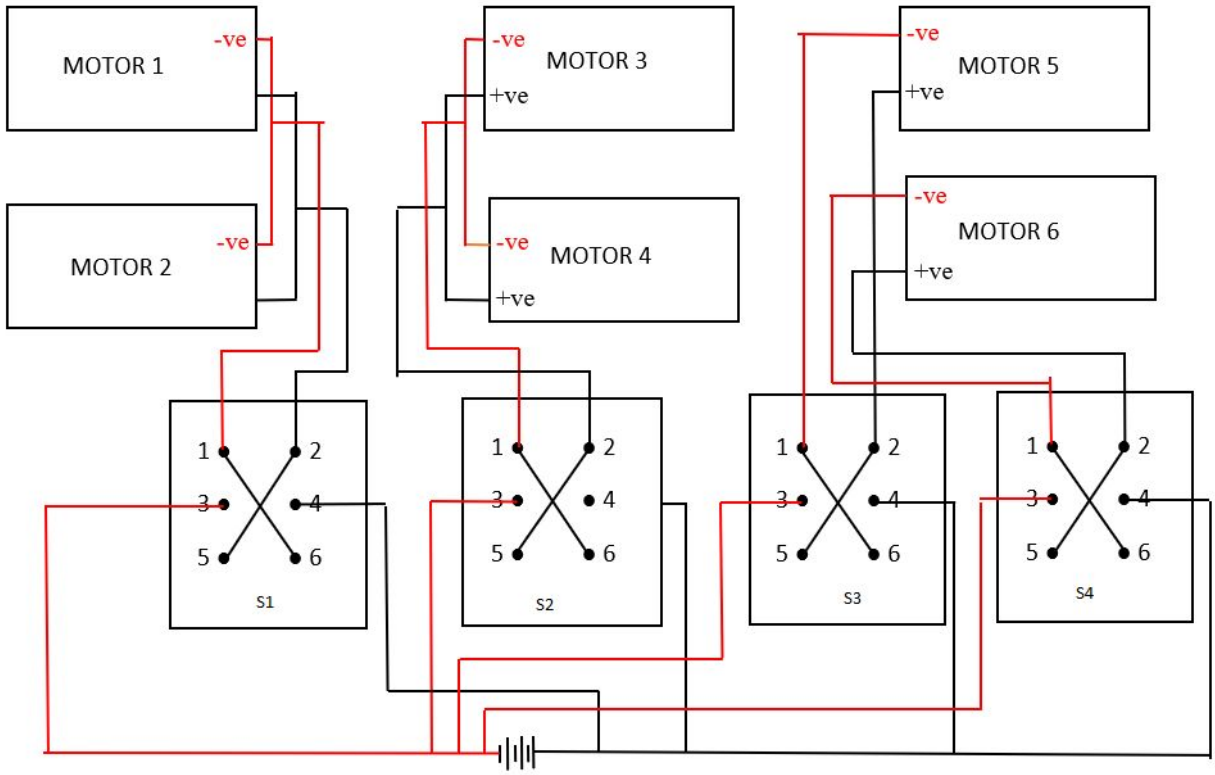
Movement of the Bot :

Motion	Switch s1	Switch s2
Forward	Forward	Forward
Backward	Backward	Backward
Left	n/c	Backward
Right	Backward	n/c
360° Right	Forward	Backward
360° Left	Backward	Forward

Movement of Arm	Switch S3
Up	Forward
Down	Backward

Movement of Fingers	Switch S4
Open	Forward
Close	Backward

Connections:



Motors 1 and 2 are used to control the 2 left wheels of the robot and the Motors 3 and 4 are used to control the 2 right wheels of the robot. Motor 5 is used to operate the arm of the robot using which the ball will be rolled along the bowling track.