RoboVR

SRB VOLLEYBALL

About the game:

Volley is a game in which the player is provided with a ball and the player has to hit the ball to the opponent's court without letting the ball touch the ground on his own court. The ball is hit over a net placed between the player and the opponent's court.

In Olympic of Robots, the robots have to play the game in a similar way except that the robot player is given the leverage of one bounce of the ball in its area before the robot can hit back the ball to the opponent's court.

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.	Wheels(x4)	Off-road type
5.	Battery	5A, 12V
6.	Remote	With 3 DPDT switches
7.	Wires	8m-10m

Robot Details:

Robot Dimensions: 11" x 13" x 12"

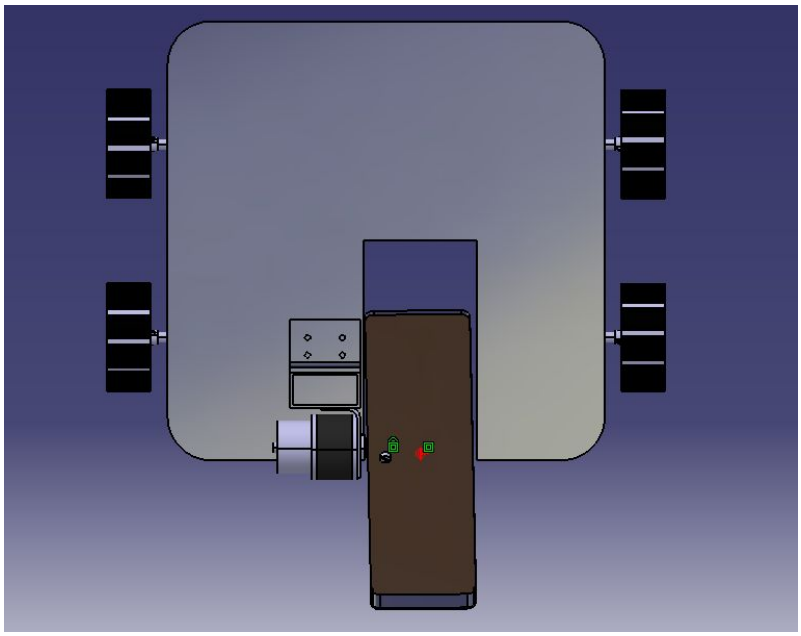
Robot Weight: 2kg

Robot Control: Wired

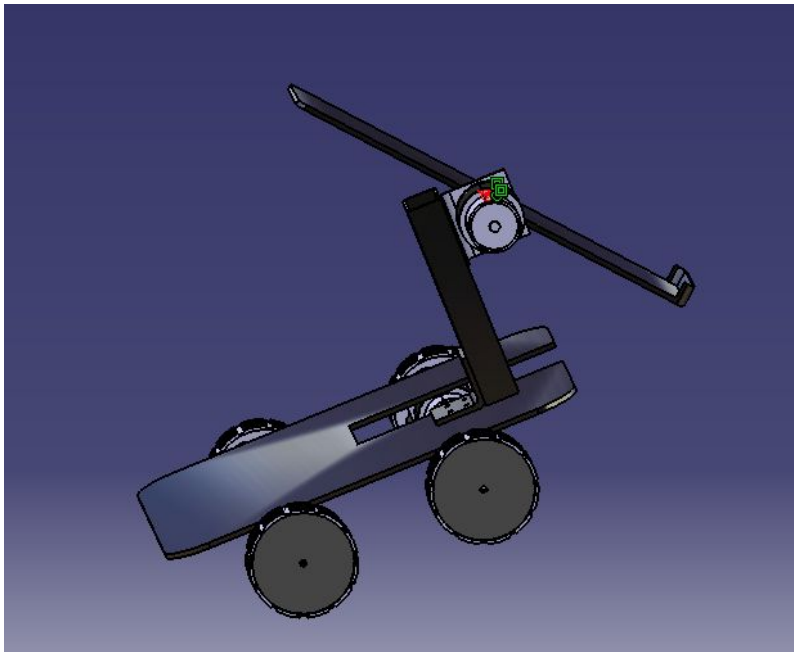
Robot Drive: 4 Wheel Drive

Mechanical Design:

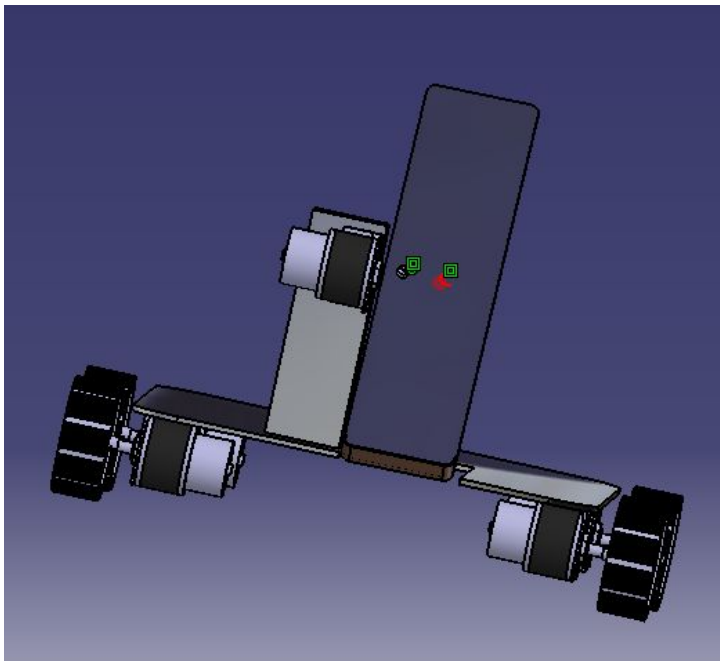
Top View



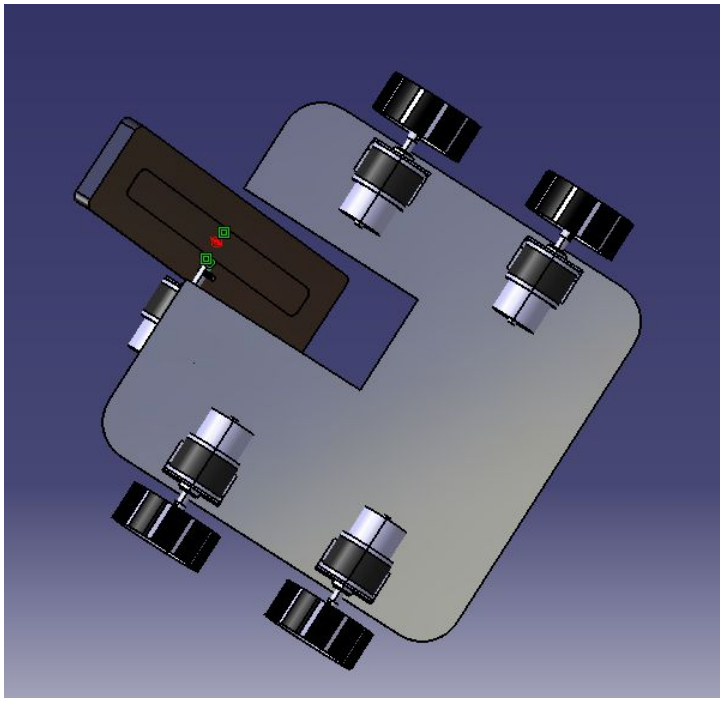
Side View



Front View



Bottom View

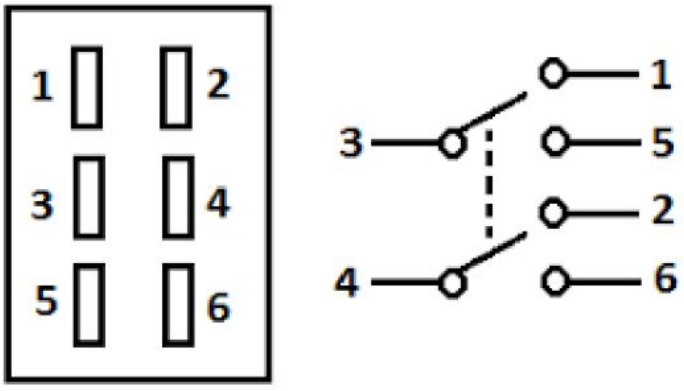


Remote Details:

A similar remote is needed to be built for this robot in which 3 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. The various movements required in the game is as follows: -

Service – The lower end of the platform which hits the ball has a raised boundary to lock the ball while servicing. Place the ball at that lower end of the platform. To lift the ball, rotate the motor of 60 rpm which controls the movement of the platform. Once the ball is in the air, use the DPDT switch to hit it over the net to the opponent's court.

Hitting the ball – The platform to hit the ball is operated using a DC motor which works with the help of a DPDT switch fit in the remote. To hit the ball, press the forward switch and to generate more power while hitting the ball, press the switch backward and then forward.

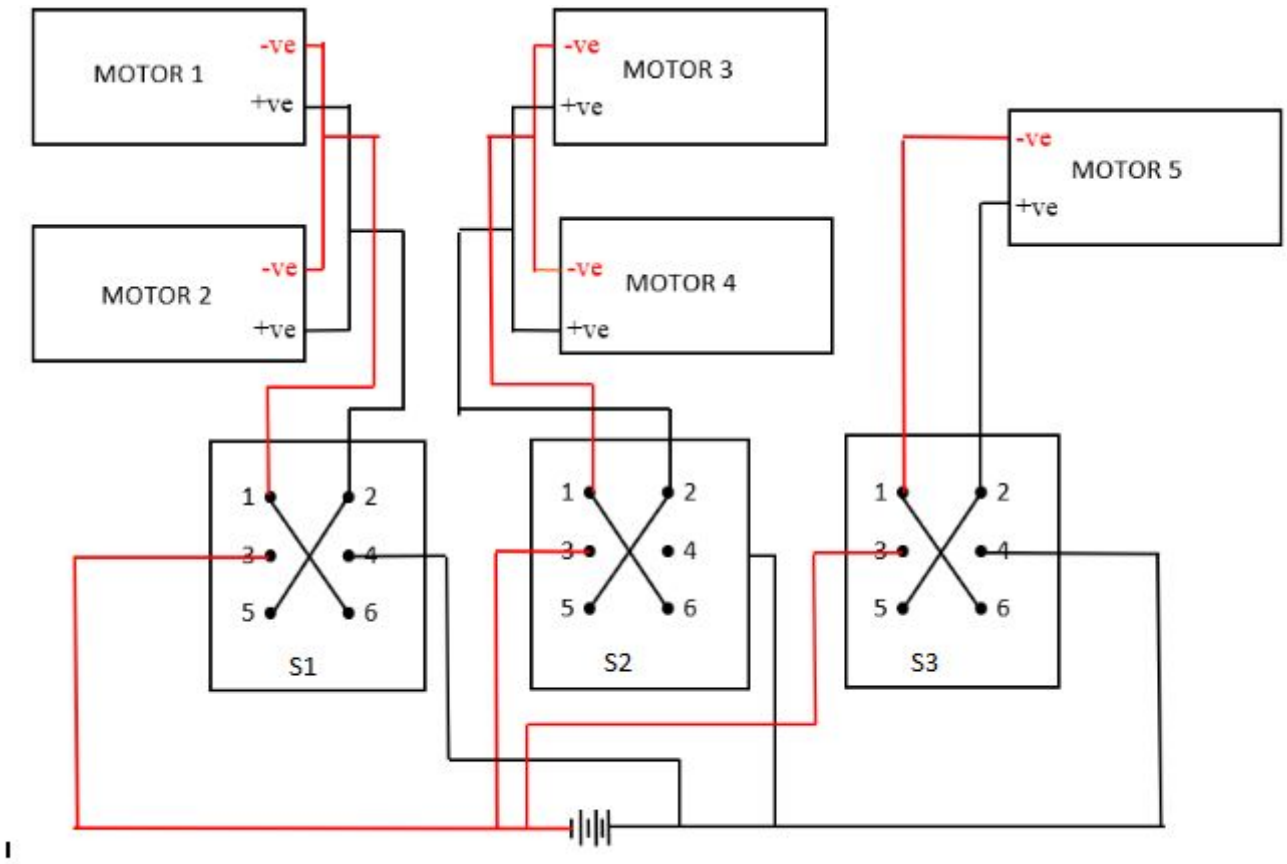
The movement of the robot with respect to the switch operation are given below in the table.

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 Stick	Switch S3
Up	Forward
Down	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 rotate the platform that will hit the ball to the opponent's court.