RoboVR

SRB BADMINTON

About the game:

        Badminton is a game in which the player is provided with a shuttle and a racket and the player has to hit the shuttlecock to the opponent's court with the help of the racket without letting it touch the ground on his own court. The shuttlecock is hit over a net placed between the player and the opponent's court.

        In the 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 shuttlecock in its area before the robot can hit it back to the opponent's court.

Components and its Specifications:

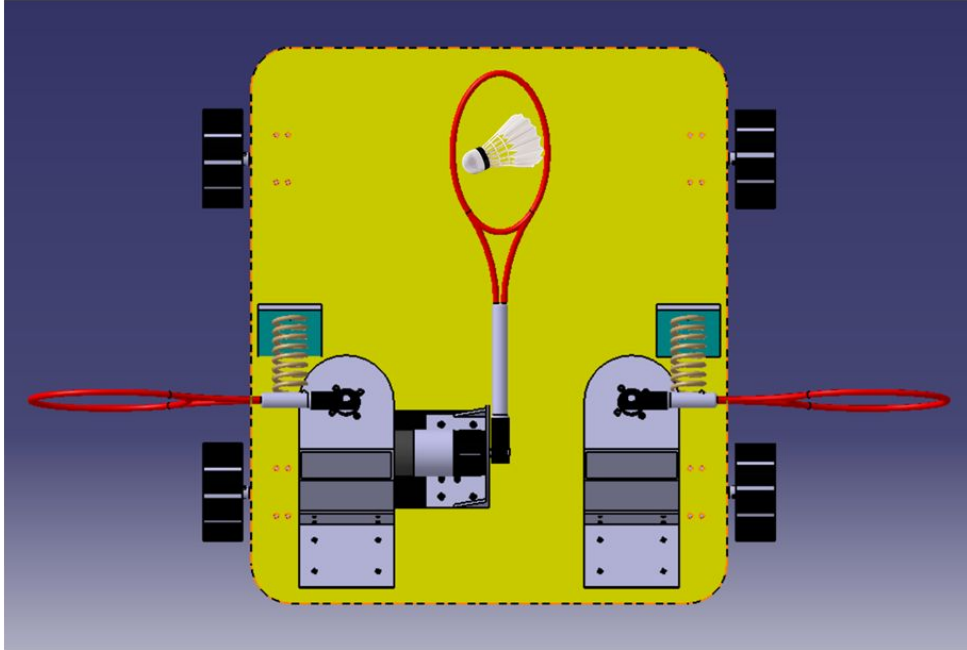| Sr. No.	Components	Specifications
1.	Chassis	Aluminum Sheet (5mm thick)
2.	DC Motor(x3)	60 rpm
3.	DC motor(x4)	300 rpm
4.	Wheels(x4)	Off-road type
5.	Battery	5A, 12V
6.	Remote	With 4 DPDT switches
7.	Wires	8m-10m

Robot Details:

Robot Dimensions: 15" x 15" x 12"
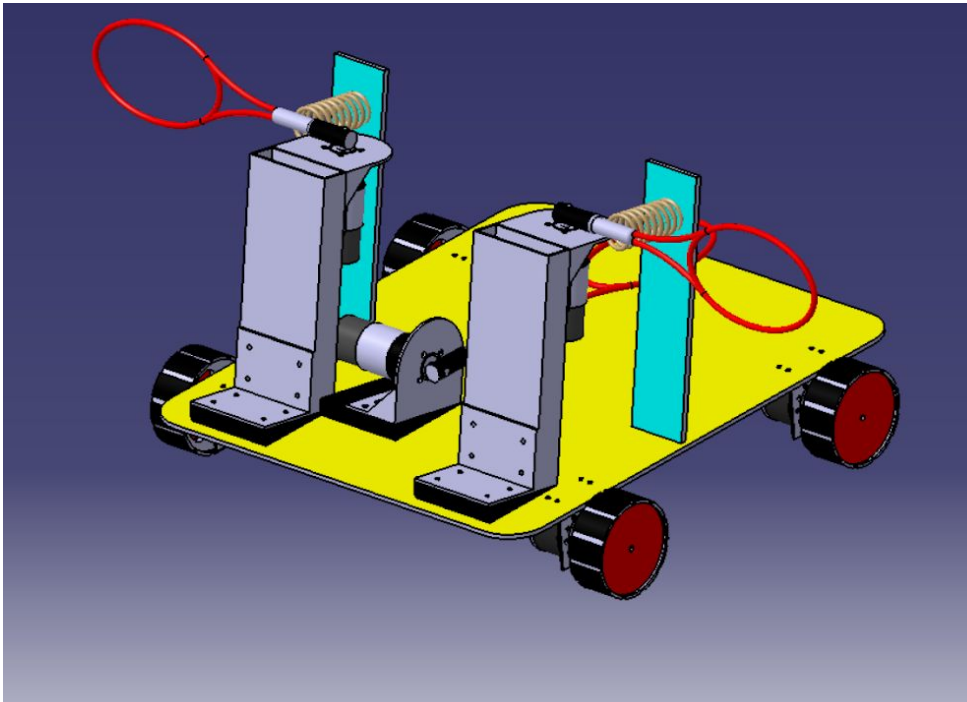
Robot Weight: 2kg

Robot Control: Wired
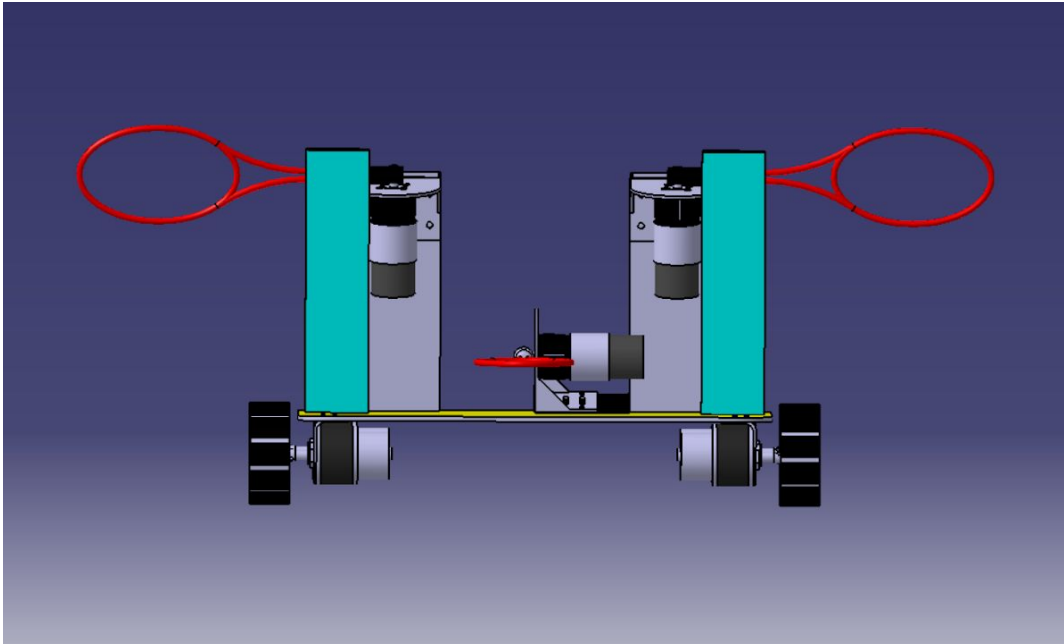
Robot Drive: 4 Wheel Drive
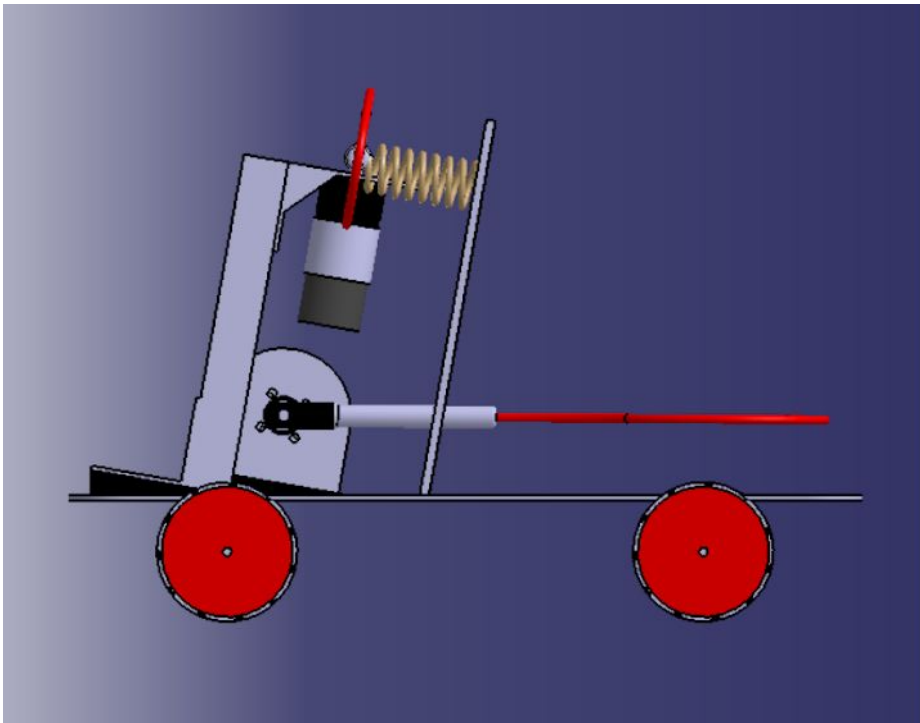
Mechanical Design:

Top View



Isometric 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.
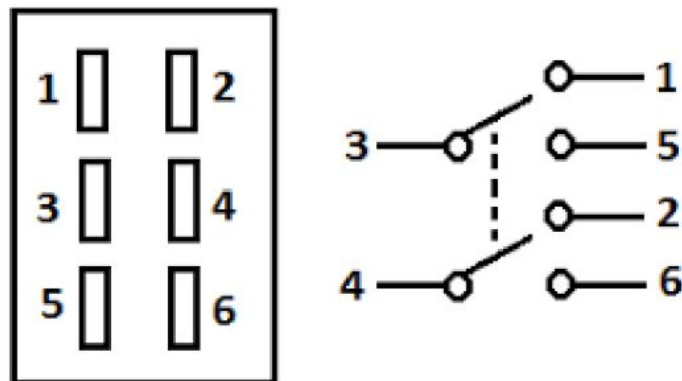
Working:

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 – Place the shuttle at the lower end of the racket. To lift the ball, rotate the motor of 60 rpm. Once the shuttle is in the air, use the DPDT switch to hit it over the net to the opponent's court.

Hitting the shuttle – The platform to hit the shuttle is operated using a DC motor which works with the help of a DPDT switch fit in the remote. To hit the shuttle, press the forward switch and to generate more power while hitting it, press the switch backward and then forward. 2 additional rackets are placed in the robot to hit the shuttle – one on the left and one on the right.

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

Connections:
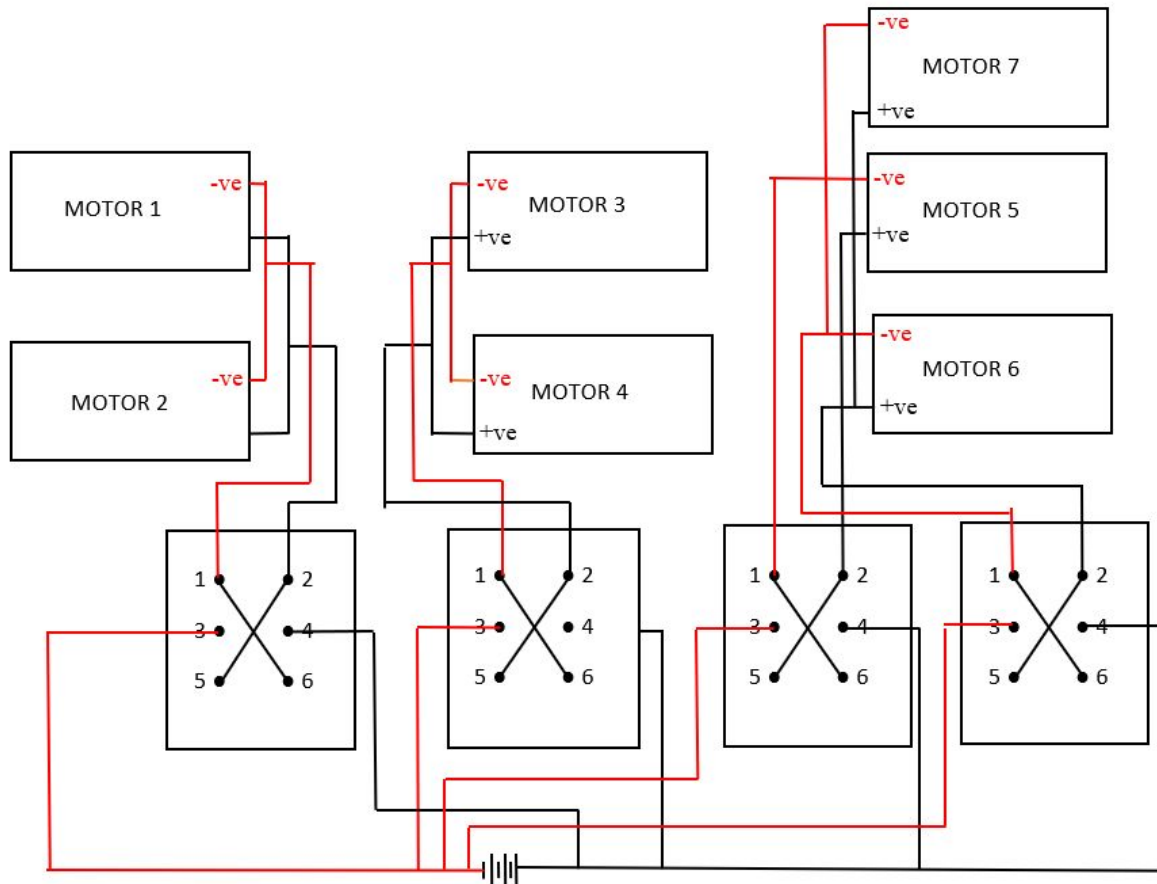
     Motors 1 and 2 are used to control the 2 left wheels of the robot and the Motors 3 and 4 are used to control the 2 right wheels of the robot. Motor 5 is used to rotate the center racket that will hit the shuttle to the opponent's court. Motors 6 and 7 are used to access the additional 2 rackets and hit the shuttle.