RoboVR

SRB ARCHERY

About the game:

Archery is a shooting game in which the player to shoot an arrow at a round target using a bow. The closer the arrow is shot to the center of the target, the more the point is received by the player.

In Olympic of Robots, the robots will have a bow attached to them and they will be provided with an arrow to shoot at the target.

Components and its Specifications:

Sr. No.	Components	Specifications
1.	Chassis	Aluminum Sheet (5mm thick)
2.	DC Motor(x3)	10 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:

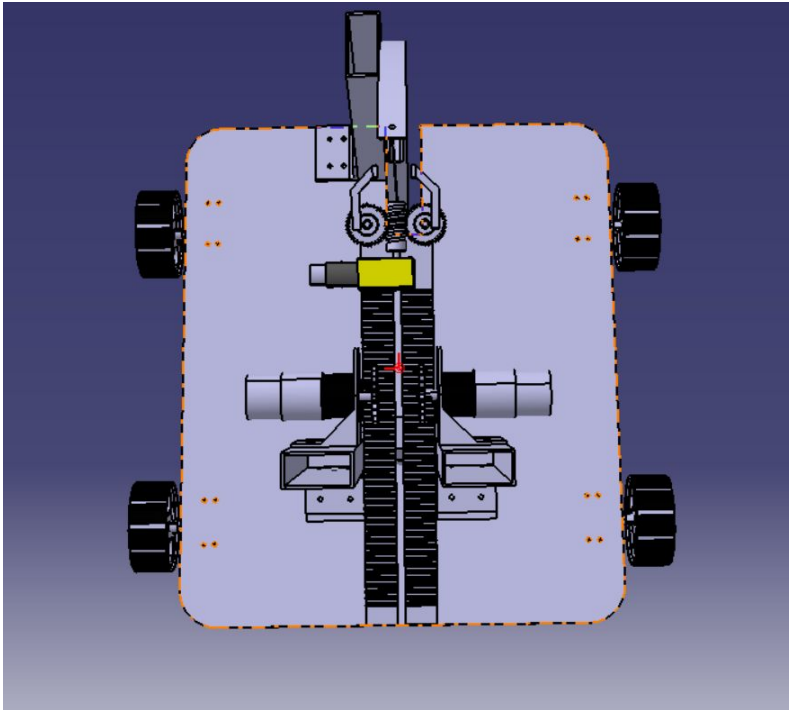Robot Dimensions: 12" * 12" * 12"
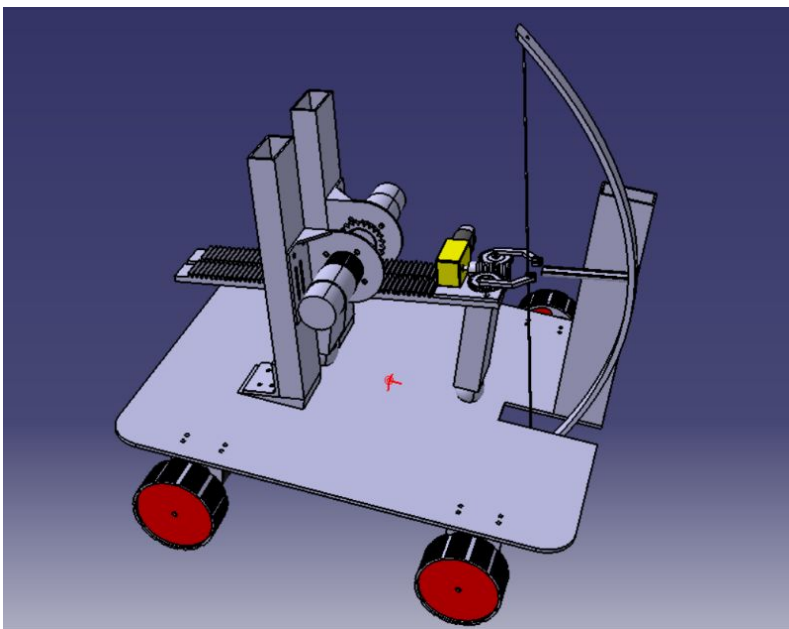
Robot Weight: 2kg

Robot Control: Wired

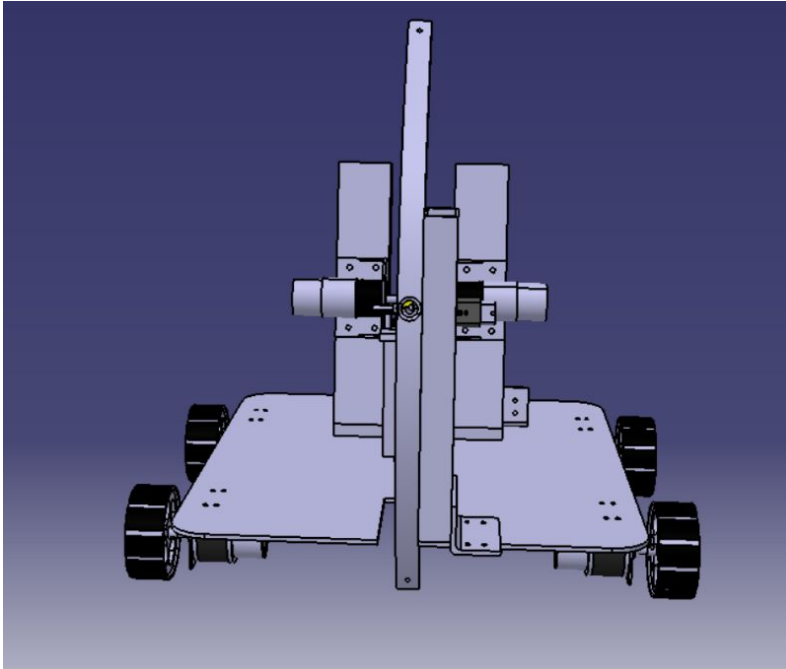Robot Drive: 4 Wheel Drive

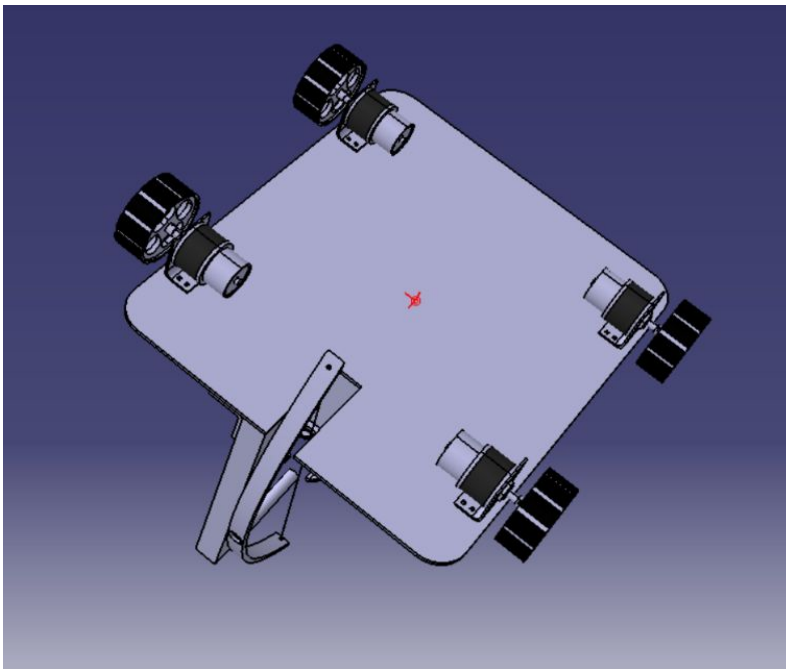# Mechanical Design:

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.
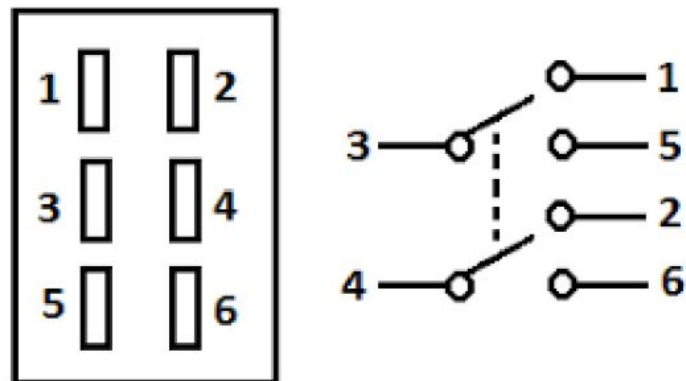
Working:

The robot moves on 4 wheels with the help of the DPDT switches remote. The robot will use 2 mechanisms for this sport: -

1. A holding mechanism actuated by the motor of 10 rpm is used to hold the arrow pressed against the string of the bow.

2. A rod-like structure attached to the other end of the holding mechanism which will also be actuated by a motor of 10 rpm. This rod when activated using the 2 motors will pull the hand (which is holding the arrow) through the rack and pinion mechanism towards the robot thus creating tension in the string. To shoot, release the previous motor which will let go of the arrow and due to the tension in the string generated by the latter mechanism, the arrow will travel towards the target.

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:
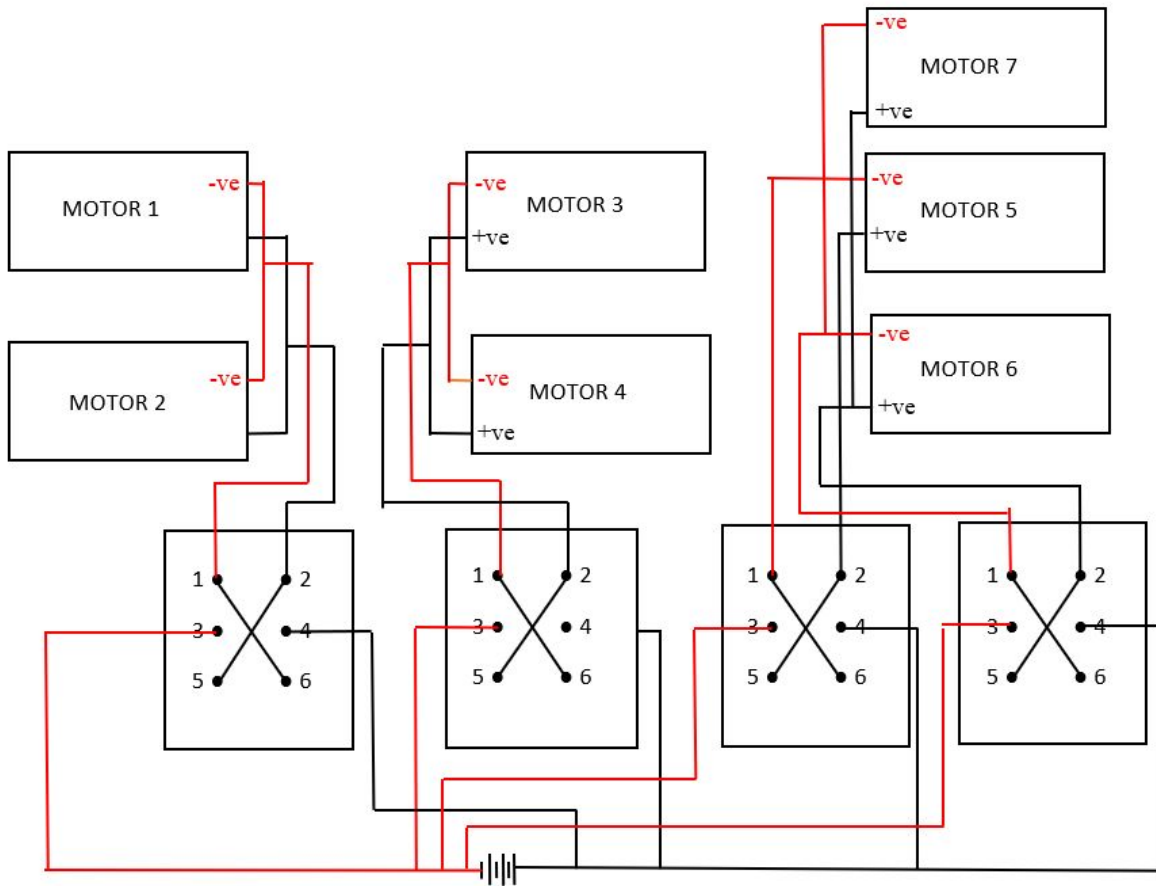
     Motors 1 and 2 are used to control the 2 left wheels of the robot and the Motors 3 and 4 are used to control the 2 right wheels of the robot. Motor 5 is used to get hold of the arrow pressed against the string of the bow. Motor 6 and 7 is connected to the 4th DPDT switch and is used to pull back the arrow using the rack and pinion mechanism and create tension in the string to generate power with which the arrow will travel towards the target.