RoboVR

SRB CYCLING

About the game:

In this game, the robot has to cycle a straight distance of 3 meter on two wheels. The specifications and components to build the robot are mentioned below.

Components and its Specifications:

Sr. No.	Components	Specifications
1.	Johnson Geared Motor - x1	500RPM-600RPM
2.	Vega motor - x1	500RPM-600RPM
3.	Servo Motor - x1	single shaft
4.	Arduino Nano	Microcontroller ATmega328
5.	Bluetooth Module HC-05	v2.0+EDR
6.	Battery (x2)	i. 9v (for Arduino) ii. LiPo 5v (2200 mAh 1S 25C/50C)
7.	Jumper wires	M-M, M-F
8.	L298N motor driver - x1	-
9.	Gyroscope Sensor	MPU- 6050
10.	Rubber Belt Drive	-
11.	Motor Coupling	Aluminium
12.	Base Chassis	Acrylic
13.	Cycle Front	Acrylic
14.	Cycle Rear Part	Acrylic
15.	L Clamp	Aluminium
16.	Momentum wheel	Plastic
17.	Pulleys	Aluminium
17.	Bolts Long	5mm and 3mm

Robot Details:

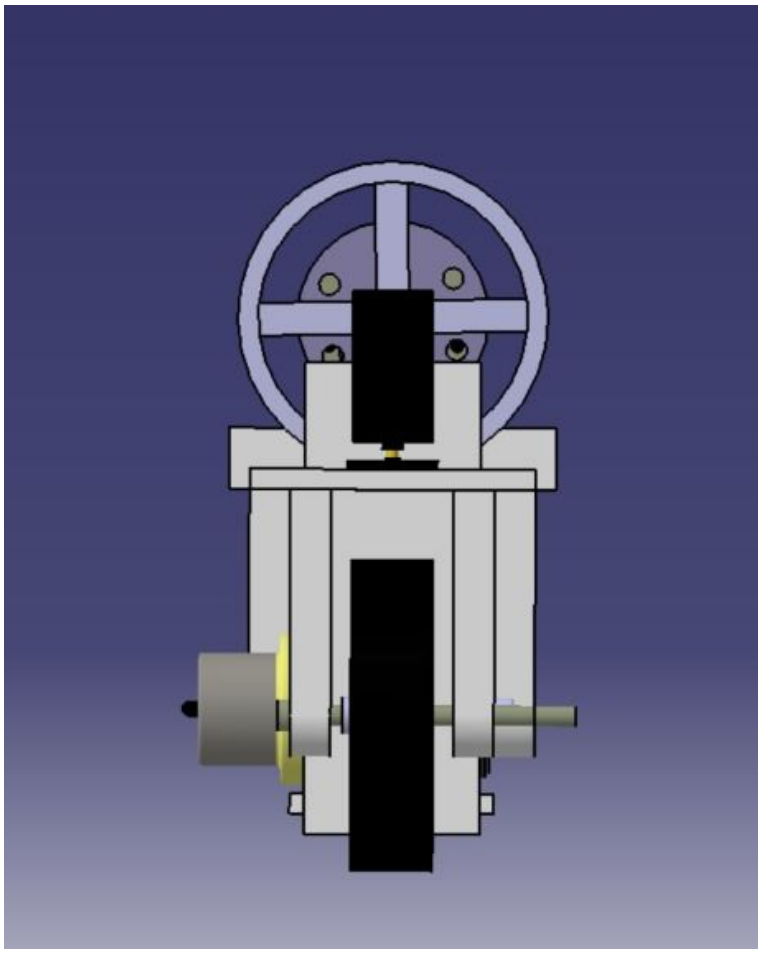
Robot Dimensions: 20” x 20” x 20”

Robot Control: Wireless

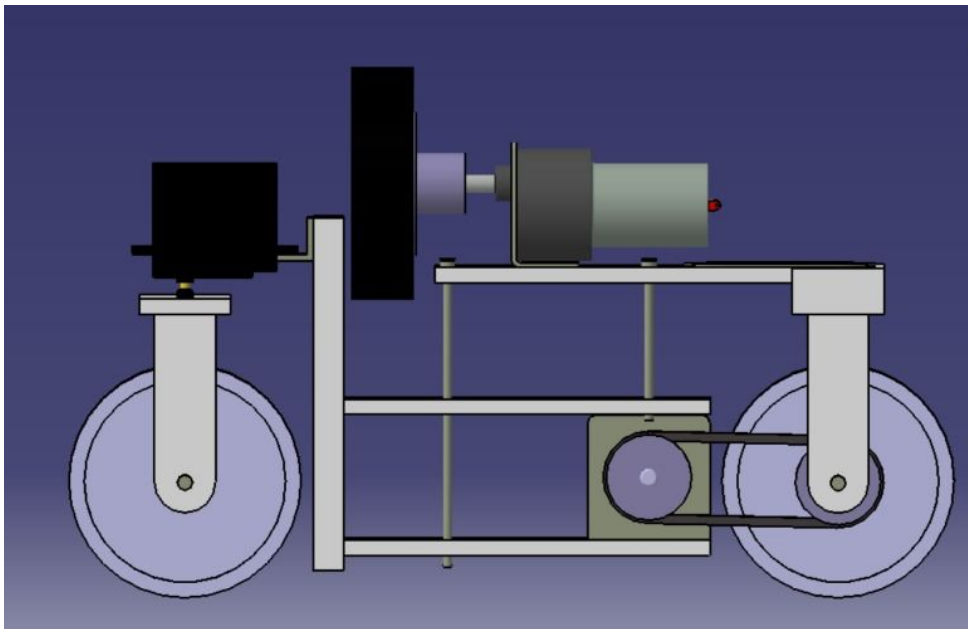
Robot Drive: 2 wheel belt drive

Mechanical Design:

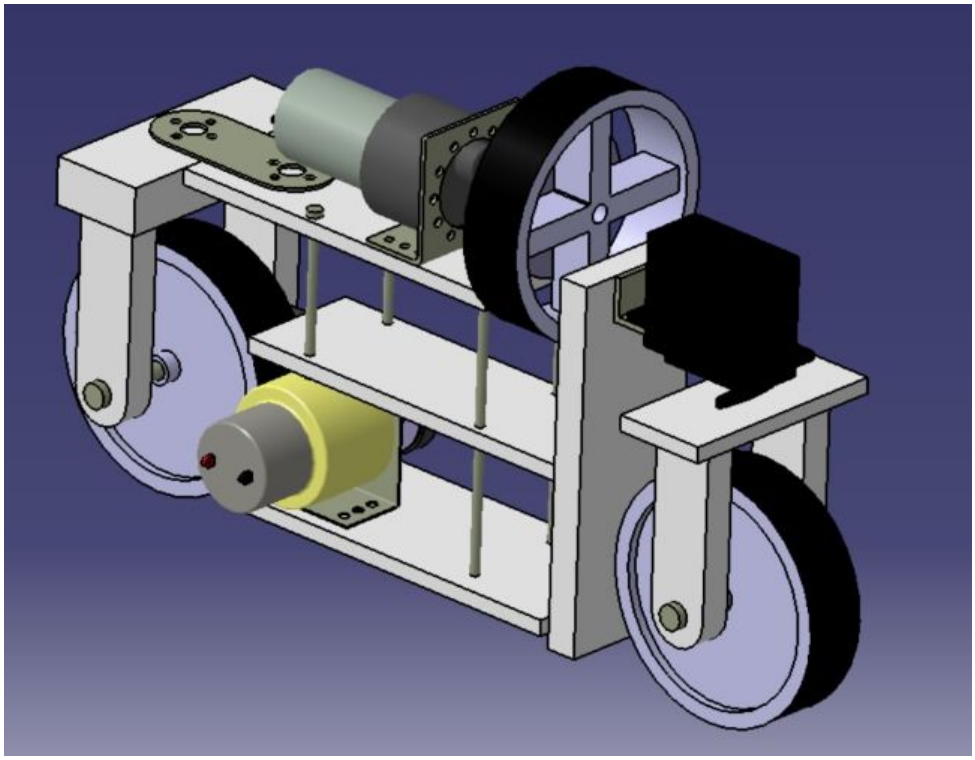
Front View



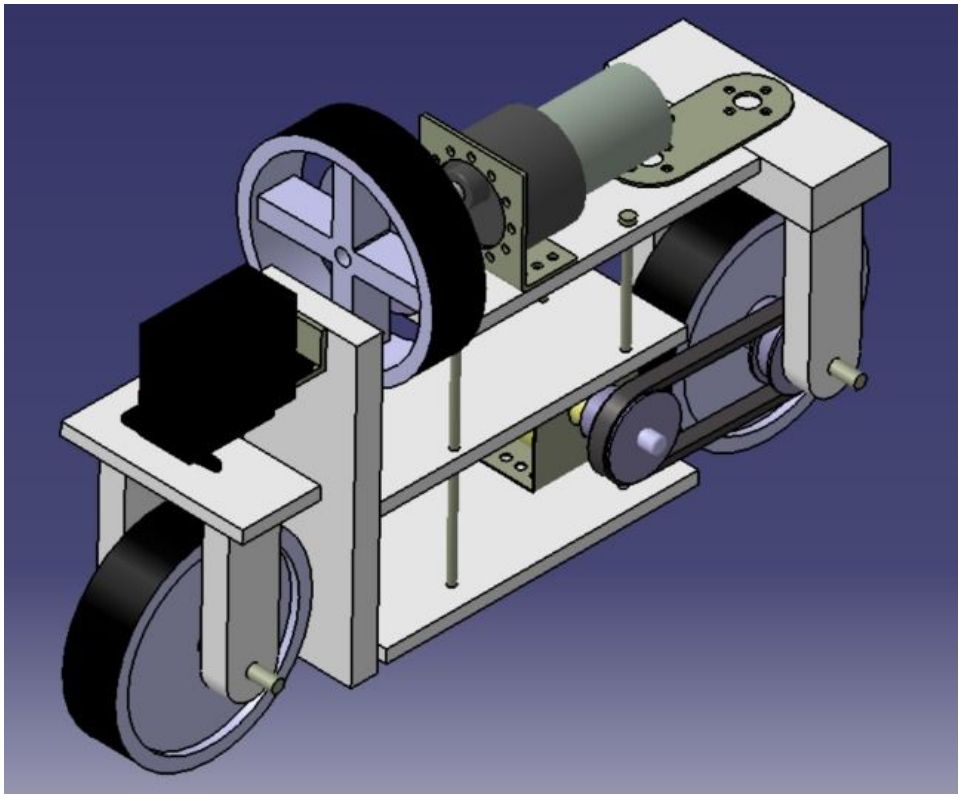
Side View



Right Isometric View



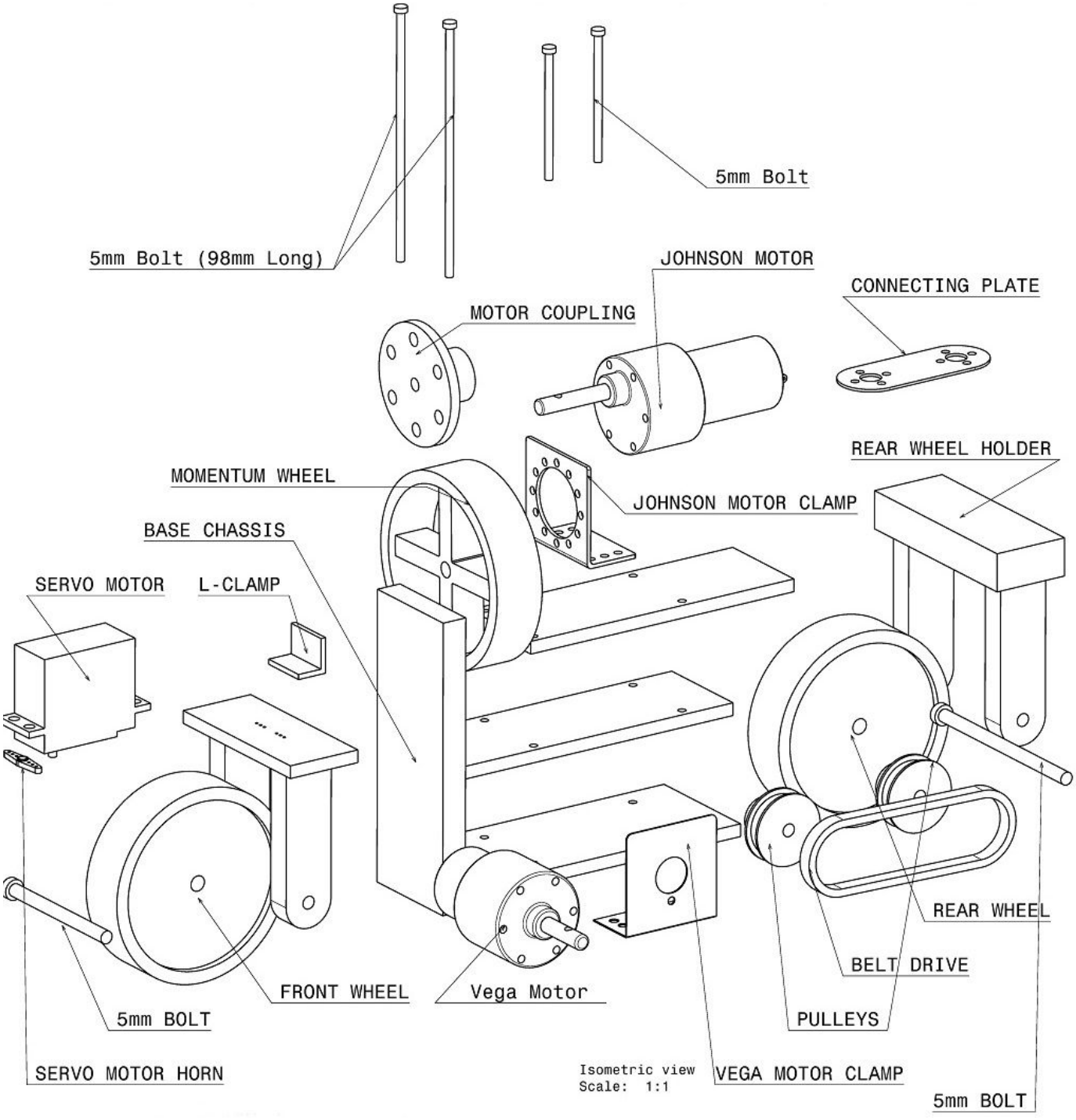
Left Isometric View



Working:

For this task we've used the momentum wheel mechanism to balance the cycle. We'll take readings from the gyroscope sensor (MPU-6050) and map with the direction and speed of the momentum wheel. The motion of momentum wheel will balance the two wheel robot. For the steering control we've used a servo motor, and for rear wheel a vega motor is used. The robot is having a bluetooth (HC05) wireless control, where we'll control the rear and front wheel. The momentum wheel is provided with a johnson motor and is having automatic control using the Microcontroller (Arduino NANO). For proper calibration, we can use PID control loop feedback mechanism.

Detailed Mechanical components and their positions are shown below:


5mm Bolt
5mm Bolt (98mm Long)
JOHNSON MOTOR
CONNECTING PLATE
MOTOR COUPLING
REAR WHEEL HOLDER
MOMENTUM WHEEL
JOHNSON MOTOR CLAMP
BASE CHASSIS
SERVO MOTOR
L-CLAMP
REAR WHEEL
BELT DRIVE
PULLEYS
FRONT WHEEL
Vega Motor
5mm BOLT
SERVO MOTOR HORN
Isometric view
Scale: 1:1
VEGA MOTOR CLAMP
5mm BOLT

Connections: