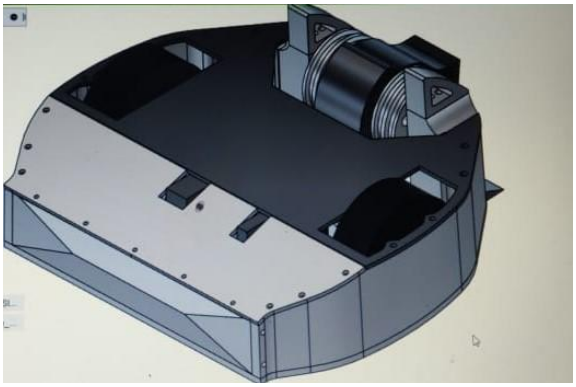
Yudhishthir-30Kg

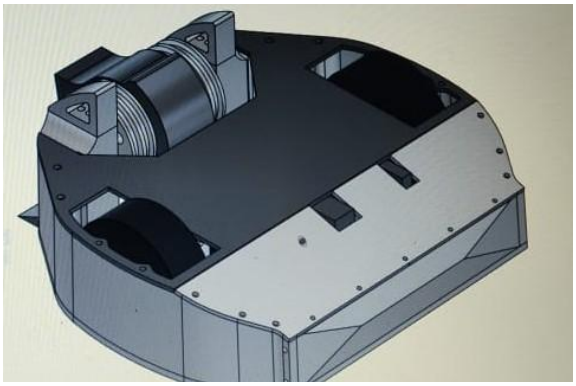
-Team Invincibles Delhi

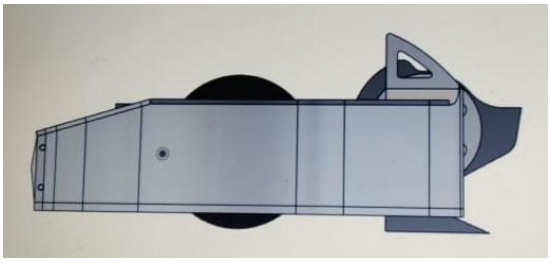
Team Leader- Dhananjay Gambhir

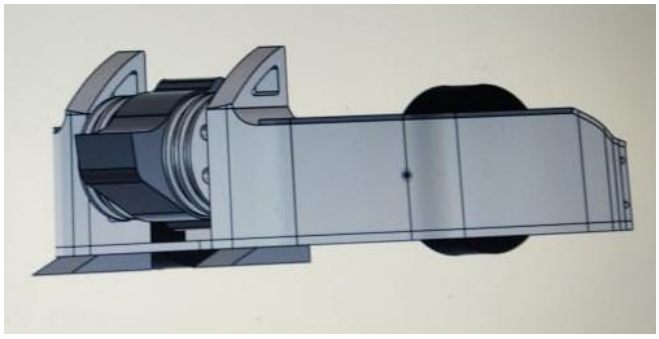
Phone Number- 7042332976

Yudhishthir -Yudhishthir is one of the heroes of the Hindu epic Mahabharata. It's Known for its immense focus on the target, which is why Our robot is named after Him.









Weapon System

The primary weapon of the robot is a **Vertical Spinner-**

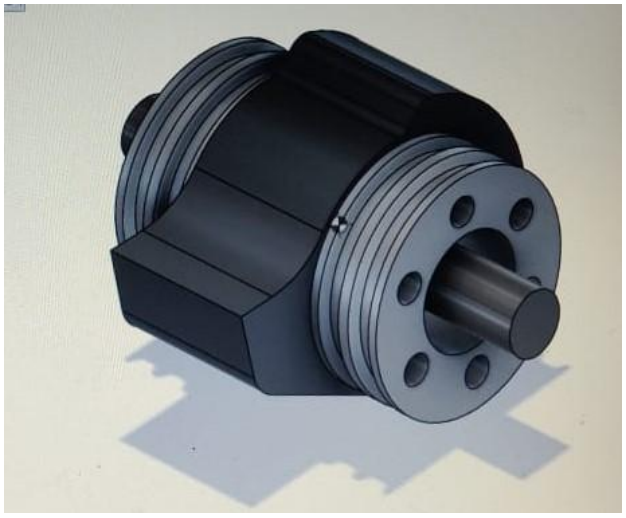
DIMENSIONS(Drum)
Total Assembly Weight-9Kg
Total Rotating Mass- 6.5Kg
Drum material-D2 Aluminium
Pulley Material- 6063 Aluminium
Outer Diameter-196mm
Shaft Diameter-30mm
Shaft Material- Grade 5 Titanium
Bite Length-23mm

The weapon can spin upto **8000 rpm.**
It can generate a maximum energy of 15000 Joules.

Weapon Motor-Customised Startor motor which can rotate upto a speed of 12000 rpm

Advantages of the Motor-

- High Power Generation
- Light Weight
- High Torque
- Low Spin-up Time
- Cost Effective



Power Supply

Lithium-Polymer(LiPo) batteries have been used to power both- the weapon motor and the drive motors of the bot.**Lithium-ion polymer battery** is a rechargeable battery of lithium-ion technology using a polymer electrolyte instead of a liquid electrolyte. High conductivity semisolid (gel) polymers form this electrolyte. These batteries provide higher specific energy than other lithium battery types and are used in applications where weight is a critical feature, like mobile devices and radio-controlled aircraft.
The following are the Specifications of the batteries used-

- Drive- TATTU 4s 6000 mAh 35-70c Lithium-Polymer Battery
- Weapon-GensAce 7s 4500 mAh 60-120c Lithium-Polymer Battery

Advantages of LiPo Batteries-

- Good safety performance
- High Capacity
- Light-Weight
- Better Discharge Characteristic

Wireless Control

- For wireless control we're using 2.4Ghz 6 channel transmitter and receiver from FlySky.
- Fsi6 tx and fsiA6B rx.
- It has a line of sight range of upto 1.2km.
- It's cost effective and has amazing build quality.
- Most popular among combat Robotics teams.
- We'll be using 2 remotes one for drive and one for weapon.
- 2.4 GHz communication because it can easily penetrate objects and give us a better and more smooth control.

Some Advantageous Mechanisms Used-

- **Skids**
- **Invertible**
- **Thick high grade aluminum armor**
- **Imported Adjustable Versa planetary gear box**
- **Self customised weapon motor**
- **Titanium shaft**

Armor

For the armor of our bot, we've used 6082E6 Aluminium which provide high strength, rigidity and impact resistance.

The side walls of the bot are 12 mm thick which helps it sustain major impacts from various weapons.

The base plate and the top plate are 5mm in thickness which provides stability to the mounts and protects against heavy impacts from the top or bottom.

The Drive System

Vex versa planetary gear boxes are used along with vex 775pro base motors.
775 pro motors are rated at 350W and 18600rpm at 12v
Compared to 200W and 6000rpm of other alternative 775 motors
Vex versa gear boxes are easily clampable and are made with precision and lighter stronger materials.
Gear ratio is adjustable from 3:1 to 100:1

For speed control of the Robot, we're using Vex Talon SRX high Quality ESCs.
They have a peak current limit of 100A for 2 secs and 60A continuous.

They are Light weight sturdy high power and easily programmable controllers with high quality aluminum casing.

Final Picture of the Complete Robot