Flipkart GRID 3.0

Objective Of Competition

A central monitoring/navigation system (such as a camera or multiple cameras) should be used to understand the arena and the position of the robots and instruct robots on actions to be taken.

Task :-

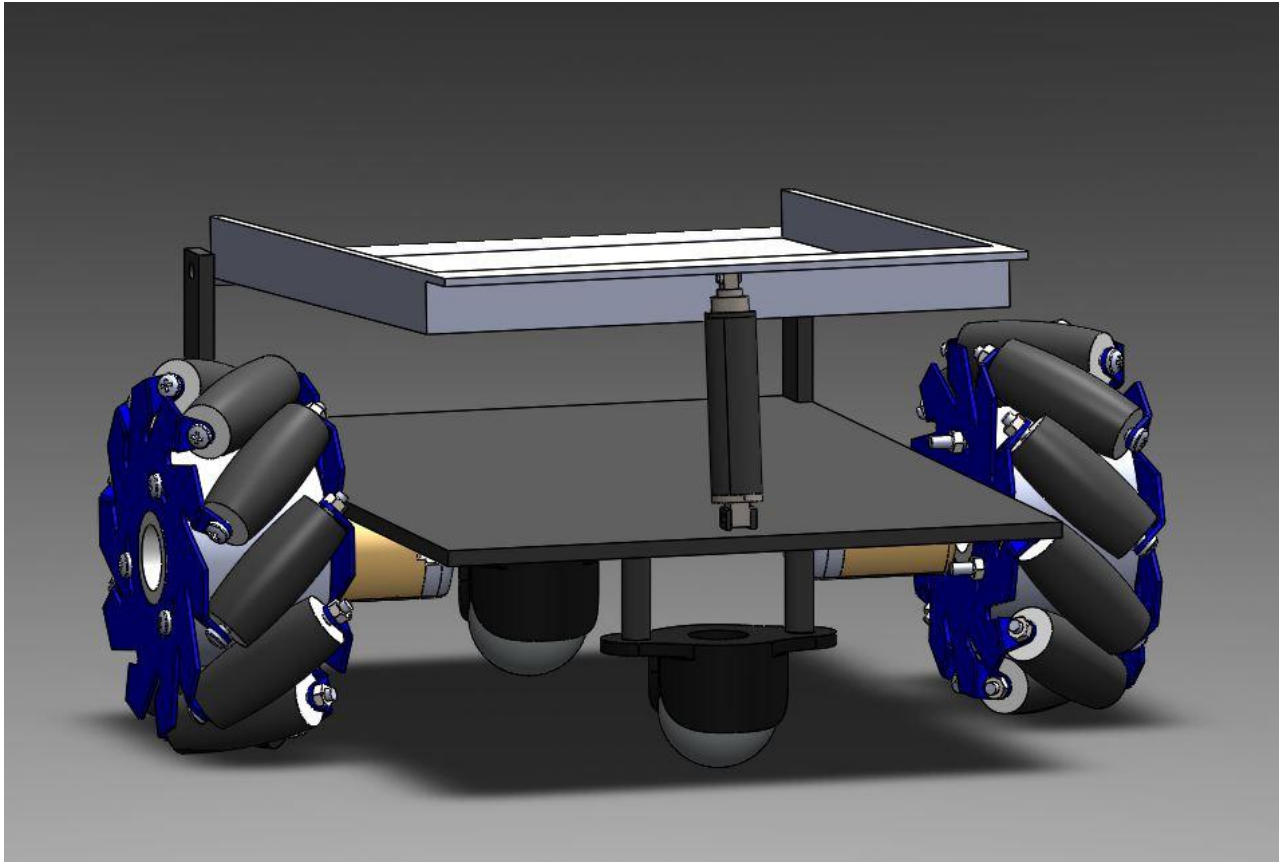
Built an autonomous bot which will carry 20*20*20mm cubical block from starting point to chute.

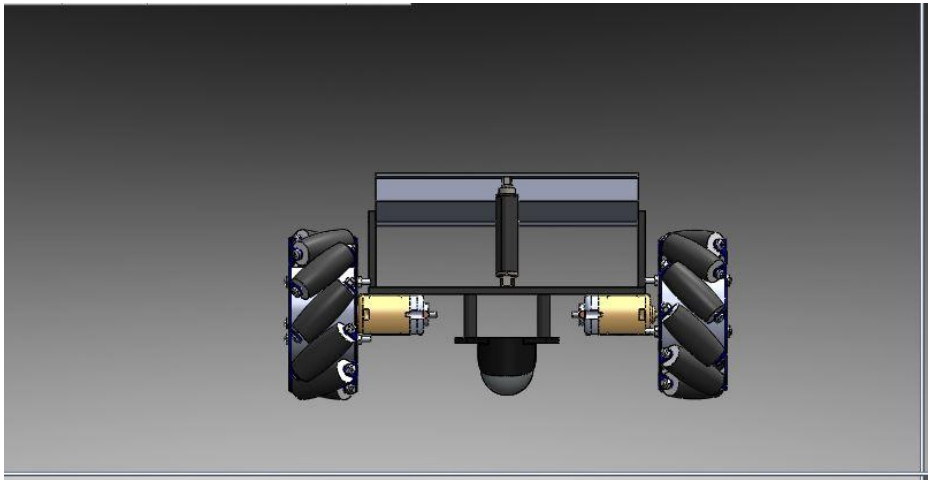
Specifications of Central System:-

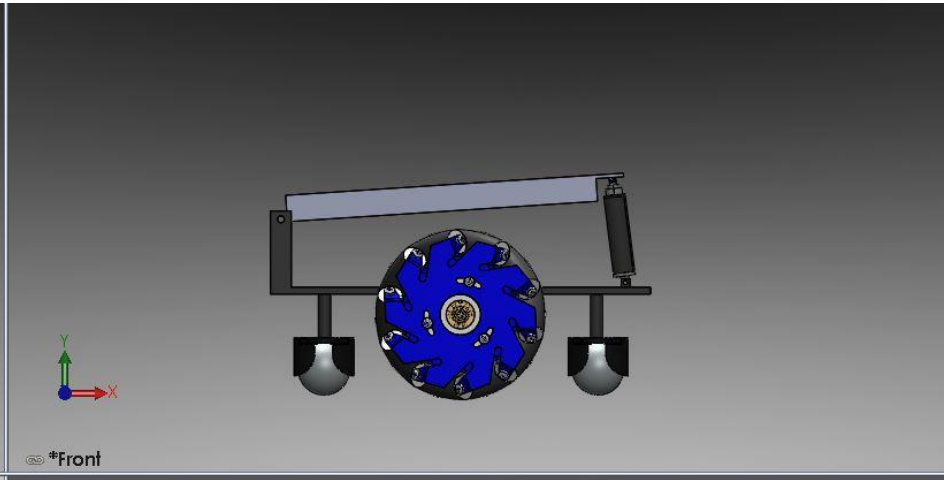
1. A central navigation system is build which consist of camera which will installed over the height and able to scan whole arena of grid system over which autonomous bot will move.
2. Navigation system is also consist of laptop or any device which is connected to internet & over which python code will run.
3. Python code by image processing will generate instruction for bot according to its position.

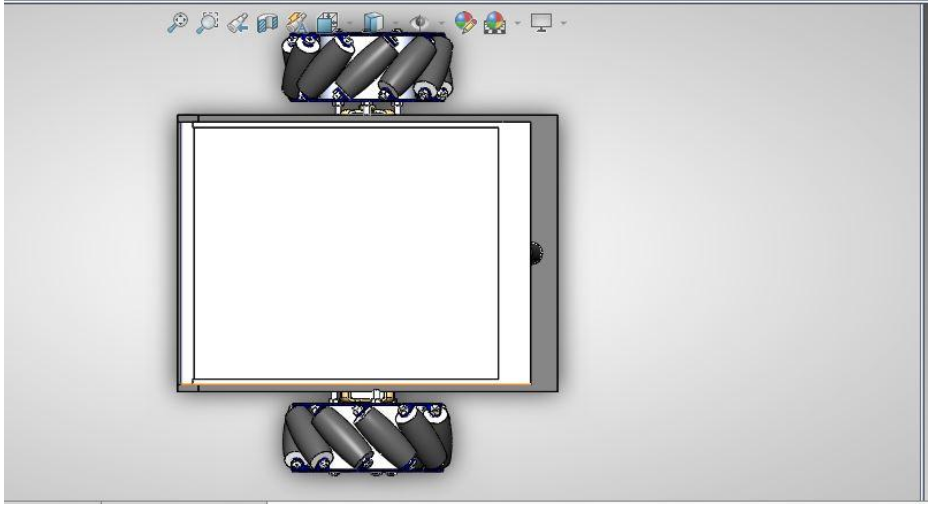
Model 1

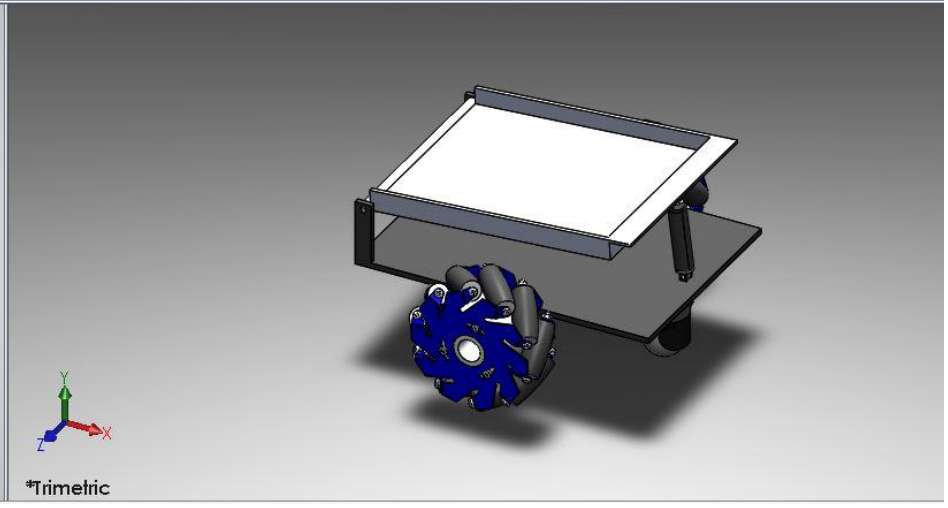
1. Bot is to fit within 6x6 inch square
2. Bot has a tray on top to carry 20x20x20 mm cube
3. Tray has the ability to flip to drop items in chute with rotation of 60 degree






*Front




*Trimetric

Specification of Bot :-

Mechanical-

1. Linear actuator to lift the tray.
2. Two motor driven mecanum wheels to enable motion in all directions.
3. Two pololu caster wheels for support.

Electrical

1. Bot consist of the esp8266 board (WiFi module), connect bot to internet
2. Tray is controlled by actuator, stepper motor with motor-driver will control actuator
3. Wheels are controlled by motor-driver and DC motor.

Challenges :-

Mechanical :-

1. Make room for electronic components while fitting in space constraints.
2. Allow smooth motion in all directions. Turn bot about its position. This is solved by using mecanum wheels.
3. Use minimum motor driven wheels. Used two motor driven wheels and two Pololu caster wheels as auxiliary wheels for support to tackle this.

Ansys Analysis

Electrical :-

1. Use of minimum boards and circuits
2. Make the board accessible other than serial communication.
3. Python code for image processing and detect the motion of the bot and send command through WiFi / Internet.

Solution :-

1. Esp8266 board with two motor-driver is used.
2. Esp8266 can be access through internet as a client to give instruction according to the position.
3. Contour detection , Line detection ...etc concepts help to build the python code.