2019

Mechanical Engineering Design Portfolio

Seeking for the position as a Design Engineer within an organization that progresses dynamically and provides me an opportunity to enhance my skills and update my knowledge.

Hashim Mohd Khan (Bachelor of Technology)
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ABOUT ME

Performance delivering design engineer, passionate about designing, proficient in CAD modelling and Drafting with 4-year Academic & 2-year Professional experience and 3 years' experience of Freelance designing in machine design in **Solid works**, AutoCAD as a Design Engineer. Demonstrated ability to work as a team in multiple deadline bound projects. I am driven by the desire to gain knowledge and work hard to achieve the desired goals. Additionally I've done **Independent research** work from **IIT Kanpur** in the area of Material Science & Engineering focused on Fibrous Composite Laminates and published a **research paper** on it.
Available for relocation

Objective: Seeking for the position as a Design Engineer within an organization that progresses dynamically and provides me an opportunity to enhance my skills and update my knowledge.

Core Competencies

- 4-year experience in academic Project work & self-learning design in solidworks, AutoCAD.
- Proficient in the use of **Solid works (2D/3D, Assembly, Simulation, Animation, Product Deliverables)**, **Auto Cad**, **MATLAB, FEA** and **Drafting Techniques**.
- Proficient in use of **static, dynamic simulation, Transient, Heat flow simulations, Explicit Dynamics, Material testing** (solid works, Ansys, digimat).
- Proficient Knowledge of manufacturing processes and Technologies.
- Keen on doing research work to improve my abilities and find out better solutions for the world.

Education and Qualifications

2013-2017- Bachelor of Technology in Mechanical Engineering (Dr APJ Abdul Kalam Technical University)

Subjects: - Strength of Materials, Mechanics, TOM, Thermodynamics, Machine Design, Fluid Mechanics, DOM, Material Science, Engineering Mathematics, Manufacturing Science, HMT.

Independent Research Work:-

- Research On Composite Materials on Jute/glass Fibers reinforced with epoxy resin.
- Fabricated by using vacuum bagging technique in ESA and advanced composite structure Lab, Department of Mechanical Engineering, IIT Kanpur.
- Computational Material Simulation is done in Solidworks Simulation(Static and Dynamic).
- Curing, post processing, making specimens according to ASTM standards and tested in Experimental Stress Analysis lab, IIT Kanpur.
- Composite Material is analyzed in Scanning Electron Microscopy Facility Western Labs, Department of Material Science and Engineering, IIT Kanpur.
- Chemical analysis and chemical spectroscopy of composite laminate is done in Energy dispersive x-ray spectroscopy (EDS) in SEM Facility, IIT Kanpur.
- Mechanical testing (Tensile Test, Impact test under Izod and Charpy Methods) has been done in ACMS Facility, IIT Kanpur.
- Optical examination of fiber alignment of the composite laminate under optical microscope.
- Published research paper on this experiment titled "Enhancing mechanical properties of jute fiber/glass fiber and epoxy combined hybrid composite laminates"

Work Experience

Inspired Automation Future Experience Technologies
Ahmedabad
Design Engineer|May’18-Oct’18
Responsibilities
1. Working with Government Of Gujarat, Roboseum(Gujarat Science City Project) at Ahmadabad on various robots. Making Our country's first-ever State of the Art Robotics museum consisting various robots from history to our modern world and to demonstrate latest technological advancement by humankind till now.
2. Work includes design and analysis of complex robotic parts and assemblies in Solid works and printing them using advanced 3D printers to produce prototypes.
3. Designed and Simulated Various Robotics Systems like Arm Manipulator,Rotary Platforms, Industrial Prototypes.
4. Taking the position of responsibility in Technical Recruitments for the company fromIITs, NITs, and other colleges.
5. Maintaining the Workshop's and FABLAB's inventory.
6. Team Management on various robotics teams.

Aliyance Mechatronics
Pune, Ahmedabad
Design Engineer|Aug’17- May’18
Responsibilities
1. Designing, procuring and fabricating various robots for Roboseum, (DST, Gujarat).
2. Work includes design and analysis of complex robotic parts and assemblies in Solidworks and printing them using FDM 3D printers to produce prototypes.
3. Designed and Simulated Various Robotics Systems like Arm Manipulator,Rotary Platforms, Industrial Prototypes.
4. My engineering work at ALROCO focuses on proprietary technologies for modernization and automation of construction industry.
5. Maintaining the Workshop's and FABLAB's inventory.

Scienaut Designs
Freelance Designer|Mar’16-present
In the following projects I've designed the 3D model in Solidworks.
Computational analysis has been done in Solidworks and Ansys Simulation in both Static and Dynamic Conditions.
- Automatic 4-way Hacksaw cutting Machine
- Multipurpose Operational Machine (Drilling, Cutting, Grinding operations in one machine)
- Quad bike
- Steering Based Grass Cutter Machine
- Reciprocating Water Pump
- Chocolate Hopper
- Chocolate Mixing tank
- Chocolate tablet forming machine
- Chocolate Powder extrusion conveyor machine
- Solar Panel Cleaning Machine
- Solar panel cleaning Robot
- Bomb Diffusing Robot
- Cuping Machine
- CEPA 1.0 (Controlled Environment Precision Agriculture)

Fibrous Composite Material Research

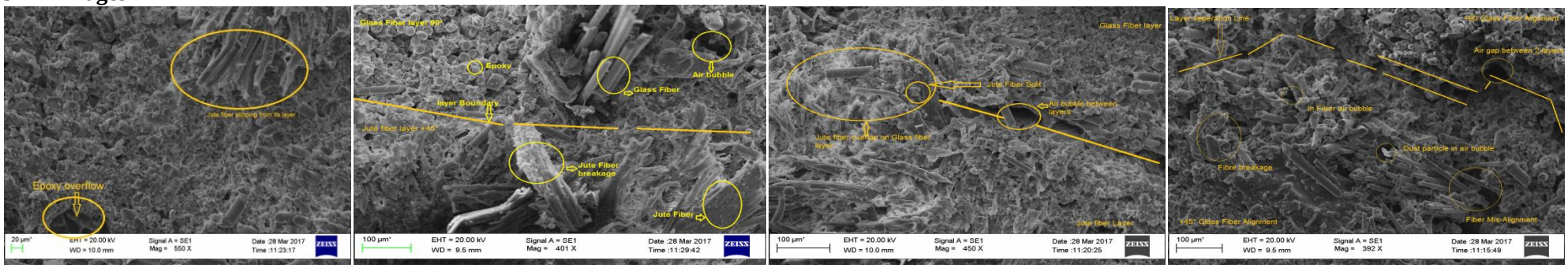
IIT Kanpur | Independent research scholar

Abstract - The natural occurring material such as Jute has been using since a long ago. But now in modern era need of people have been changed and moving towards new advanced materials and should be of less cost. Jute fiber is a bio-degradable material so in time it will dispose of naturally. In this study we have enhanced the mechanical properties of Jute fiber and Glass fiber composite by mixing with epoxy. And now that composite are more reliable and sustainable than the conventional one and partially eco-friendly.

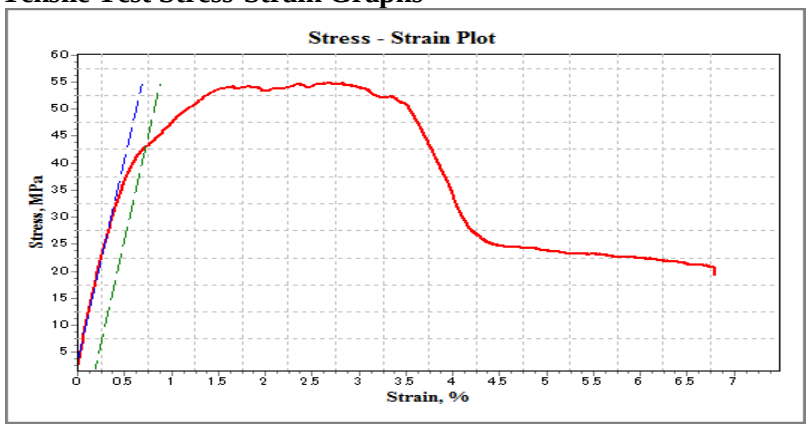
Process of research work

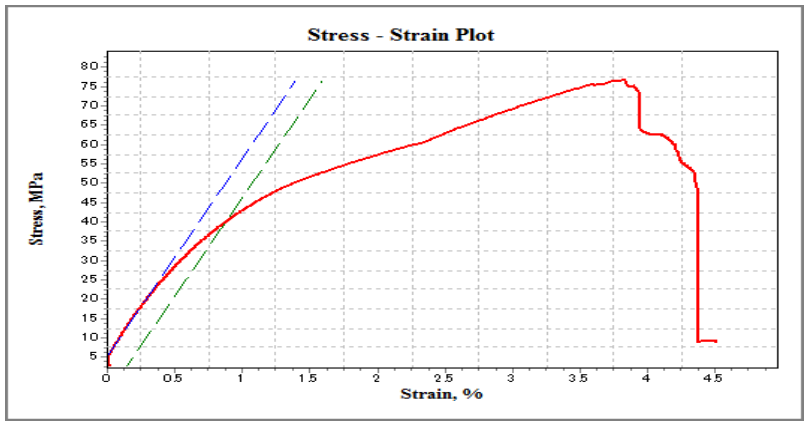
1. Literature review of fibrous composites.
2. Selecting the low cost and optimum design and fabrication process of composite i.e. Vacuum Bagging Technique.
3. Selection of fibers and binders
4. Fabrication and mechanical testing.
5. Simulation
6. Scanning electron microscopy test.
7. Energy dispersive X-ray spectroscopy test.
8. Publishing research paper.

SEM Images

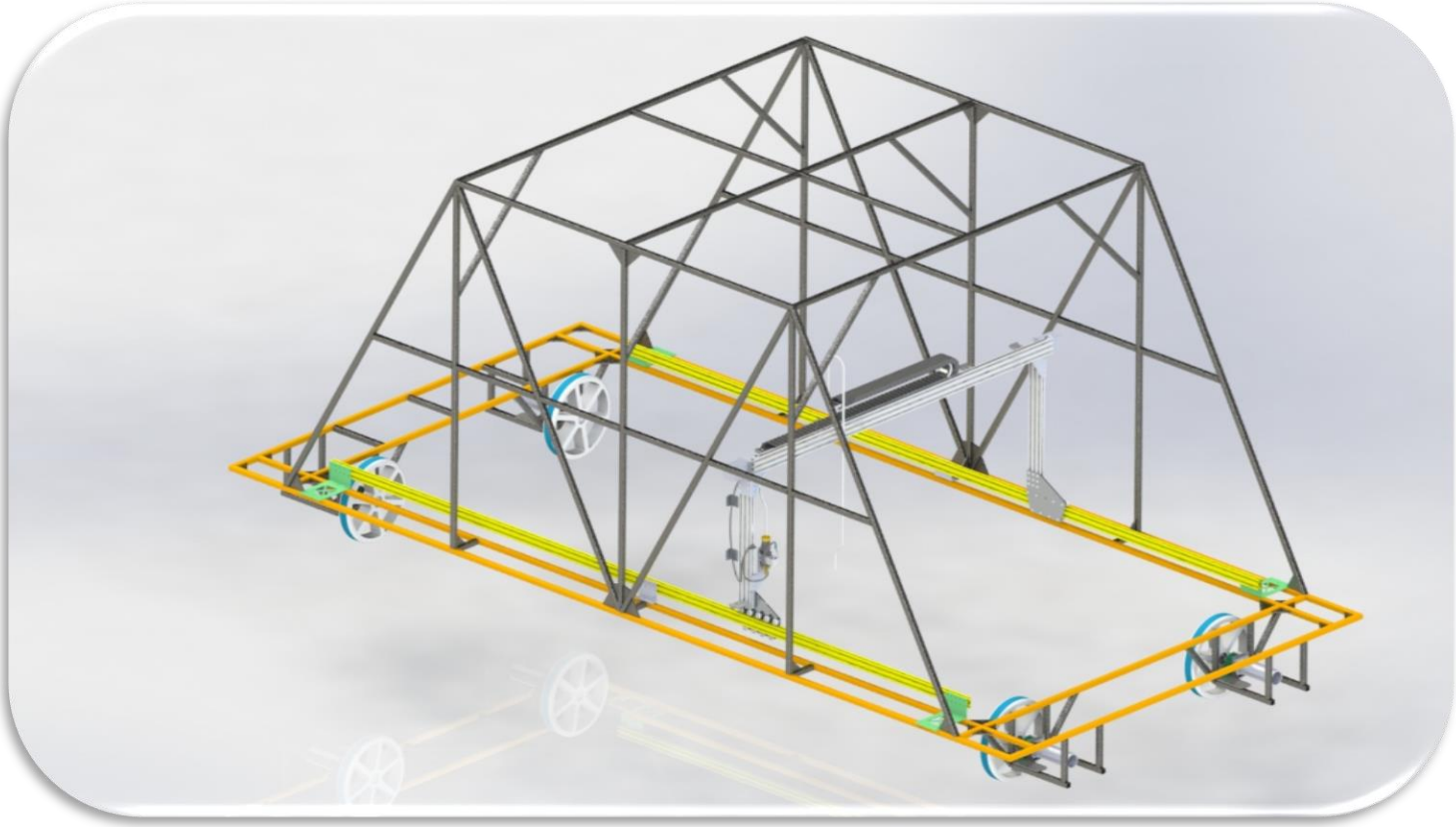


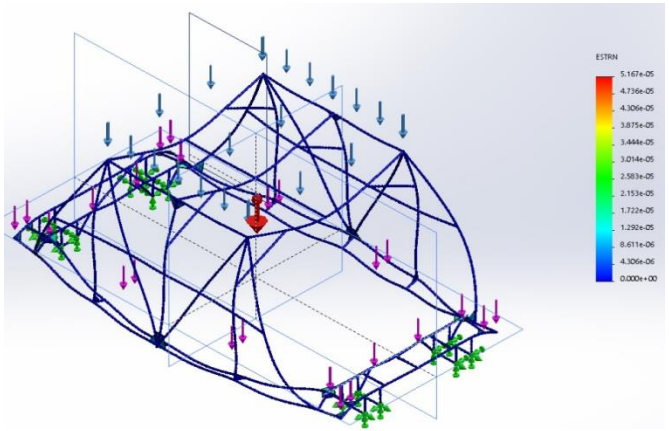
Tensile Test Stress-Strain Graphs

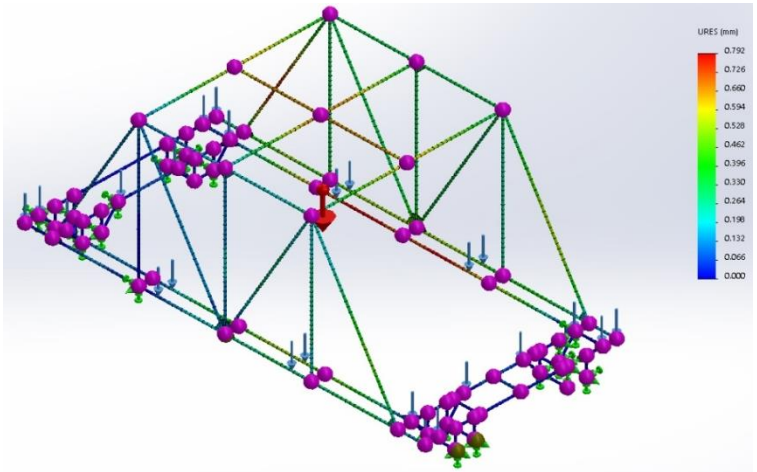




CEPA-1.0 (Controlled Environment Precision Agriculture)
Client- Mancorp Innovation Labs



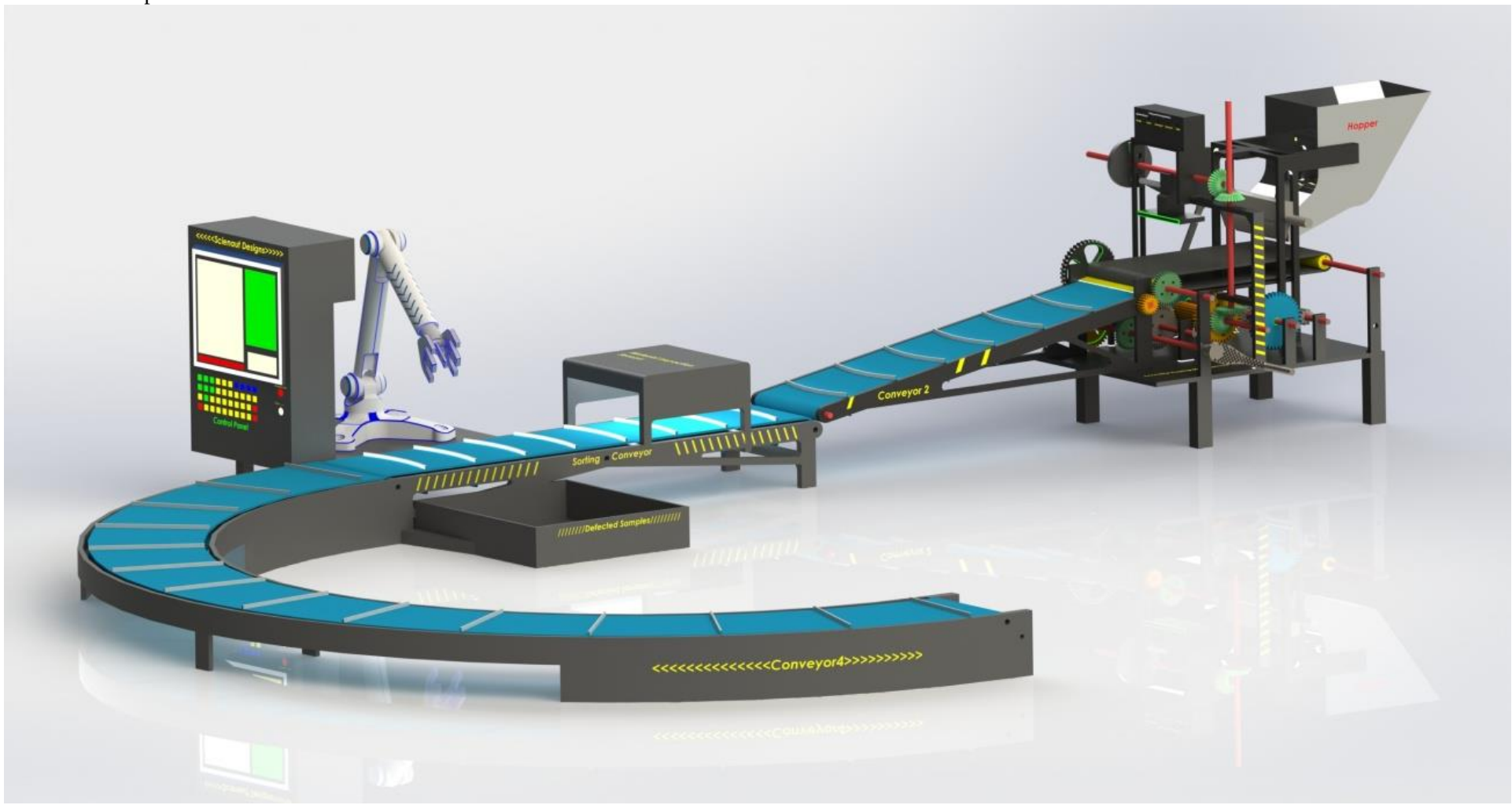




This system is designed to make the farming smarter, efficient and faster using no of sensors systems. It is path guided autonomous robot which monitor the crop growth, soil parameters, weeding, seeding, watering …etc all maintenance work on the field automatically and send the whole crop report directly to the farmer.

Cuping Machine

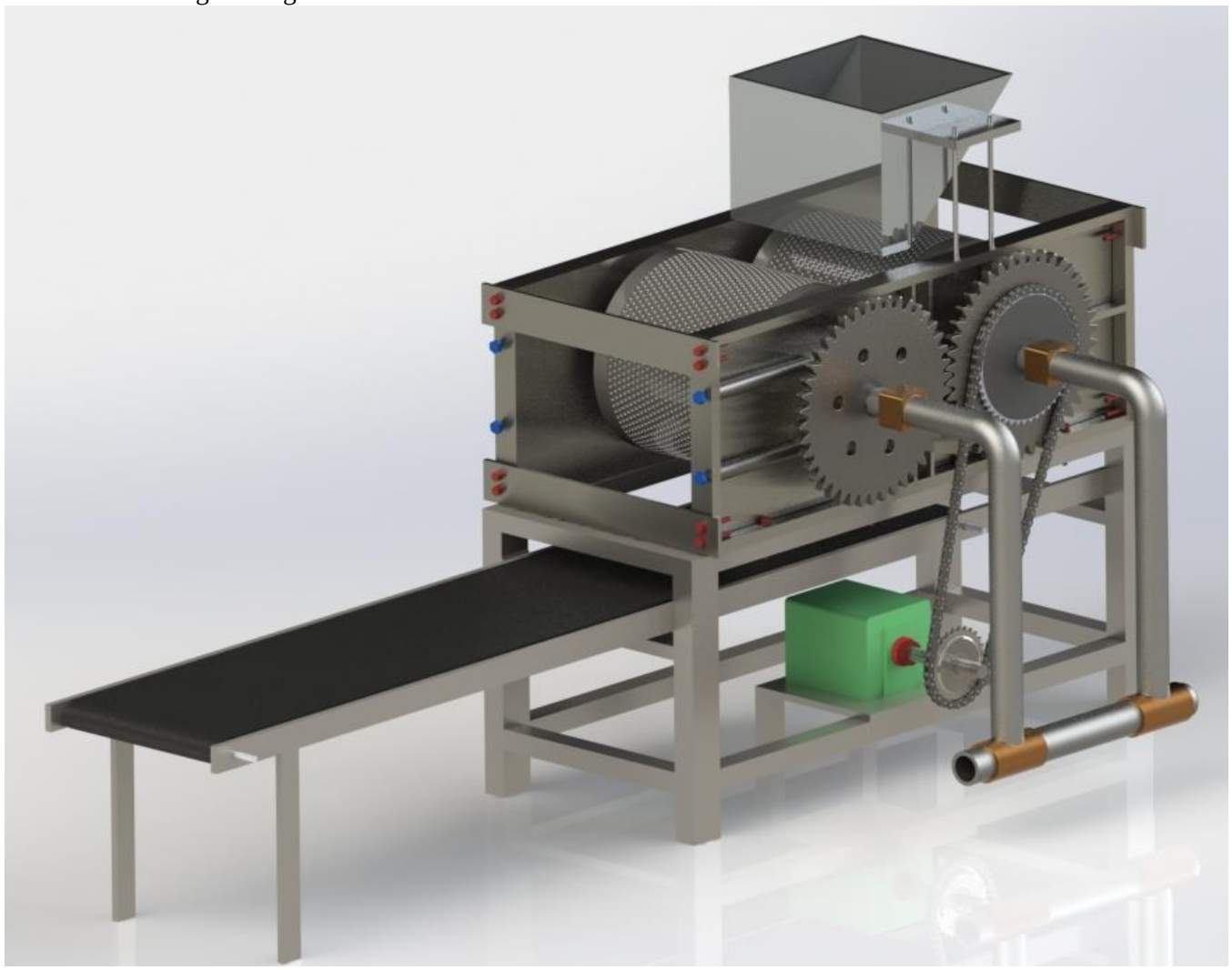
Client- IIT Kanpur

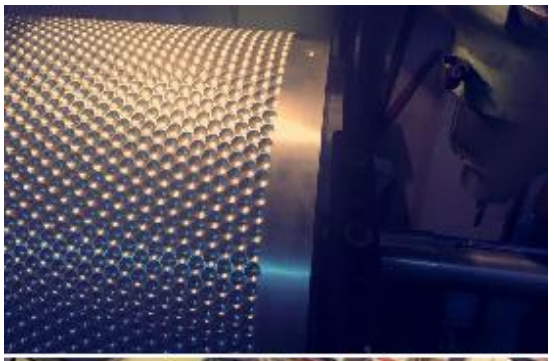


This machine was designed for a college research work at IIT Kanpur. It shows the gear train systems includind Spur, bevel and helical gear systems with a conveyor belt system, cutting mechanism, punching mechanism, metal/faulty piece detector, sorting robotic arm and semi-circular conveyor belt system. This actually designed to demonstrate the industrial up-gradation from pure mechanical system to industrial automation for the better learning of students.

Chocolate Chip Forming Machine

Client- Hi tech Engineering



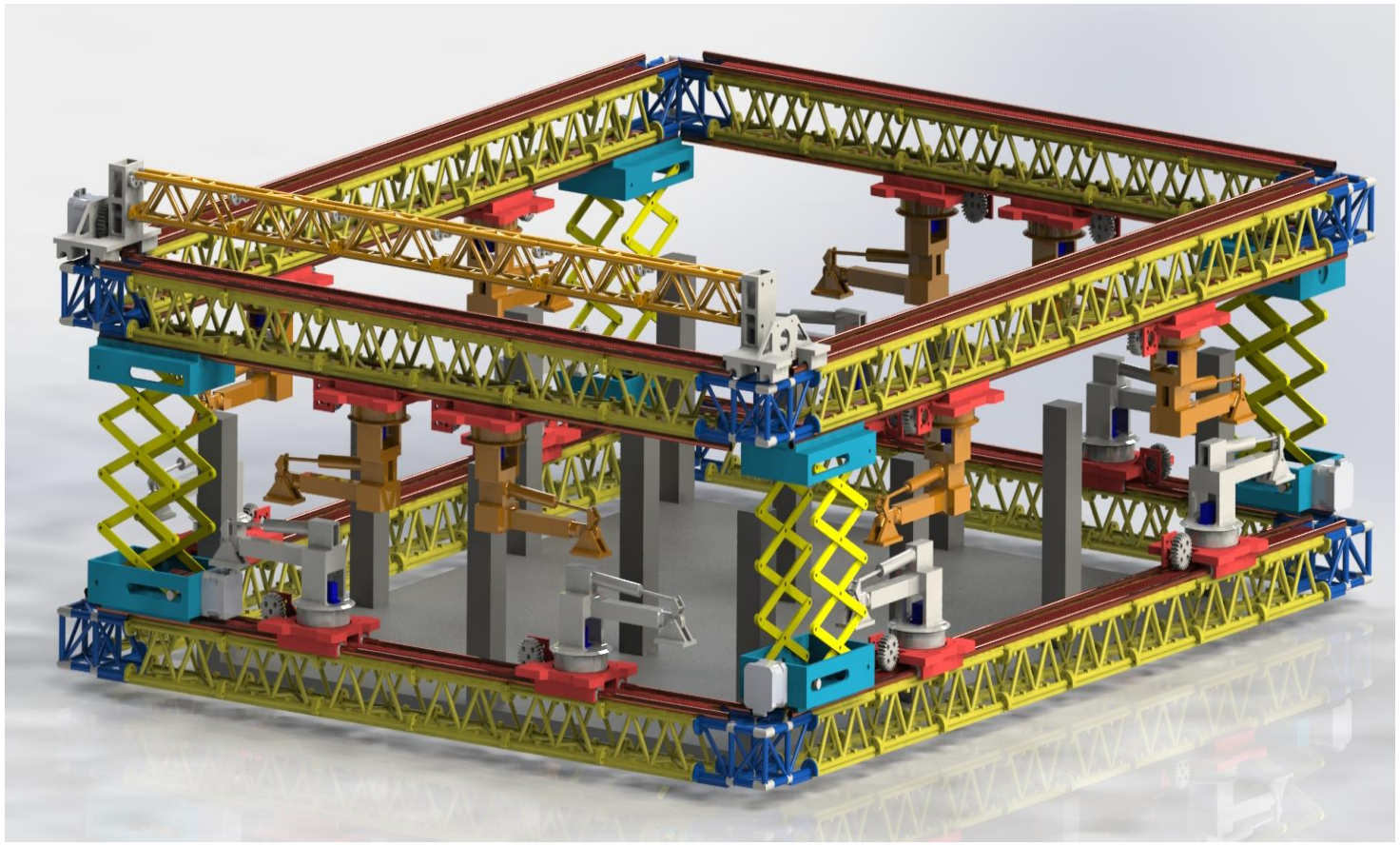


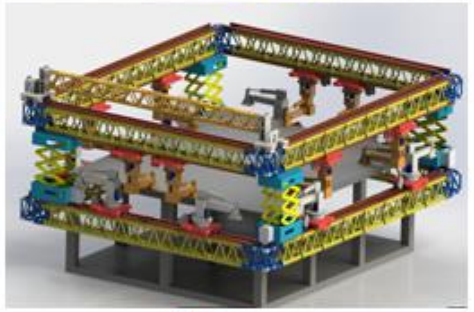
This Machine was designed for production of choco-chips (Cadbury- GEMS) candy using the molten chocolate and transferring them through the roller which has cavity in shape of chip. The molten chocolate is cooled by liquid ammonia which is in the roller transferred via pipes. The mechanical power is being transmitted by 3-phase Induction motor, 1 HP and chain-sprocket drive system. It also consists of a conveyor belt which moves forward with the choco-chips.

DESAC- Dynamic Elevating System for Automated Construction

Client- Aliyance Mechatronics

This project was featured in Dubai Future Acceleration-2017



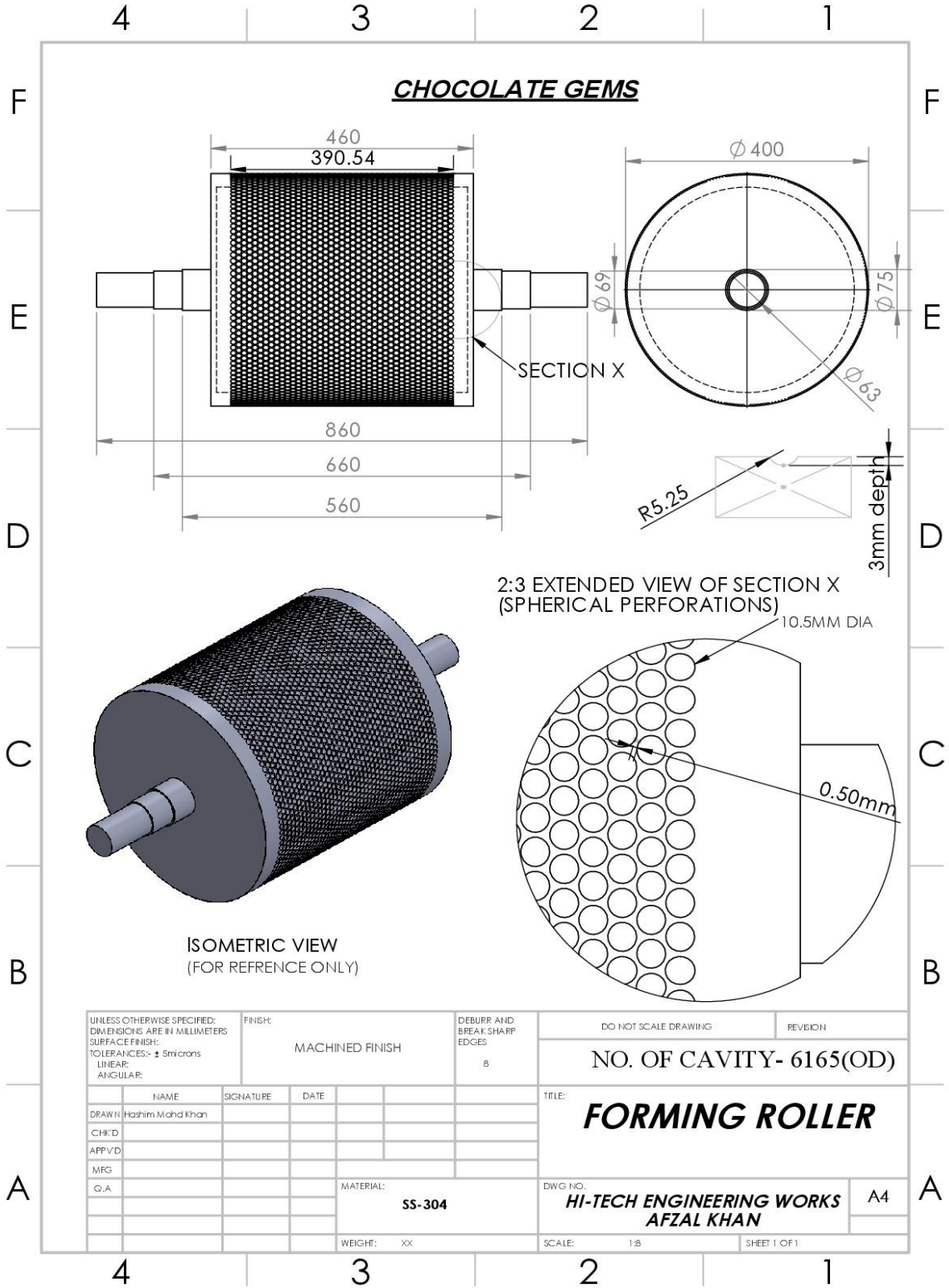


DESAC was my first industrial prototype in additive manufacturing systems which is designed to automate the construction work of multistory buildings which saves times and reduce labour cost and create very less pollution in comparison to other conventional methods.

This project was featured in DFA-17, Dubai for innovative construction technologies. Also we have a patent on this concept.

Chocolate gem chip forming roller

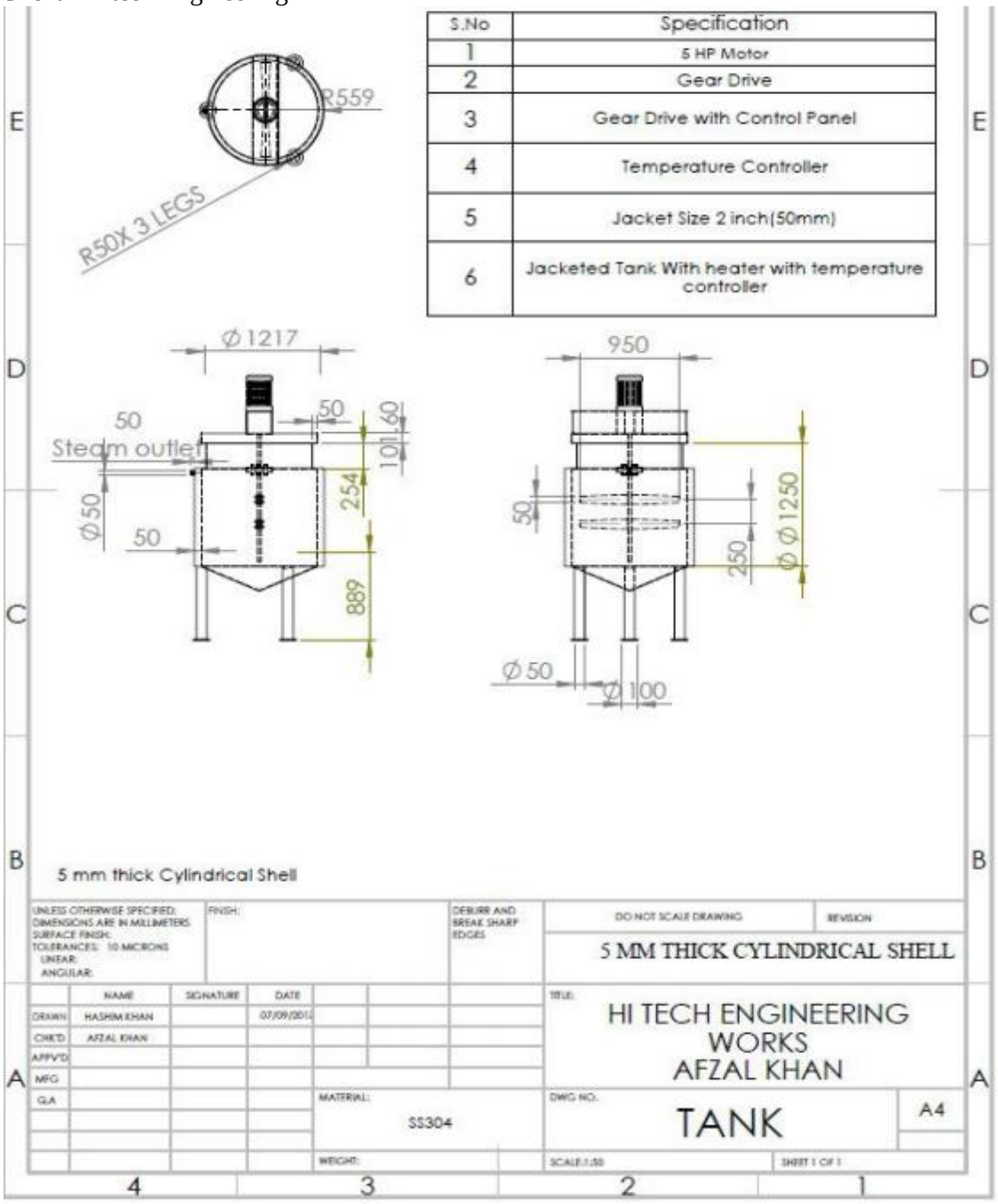
Client- Hi tech Engineering



Chocolate Hopper Machine

Client- Hi tech Engineering

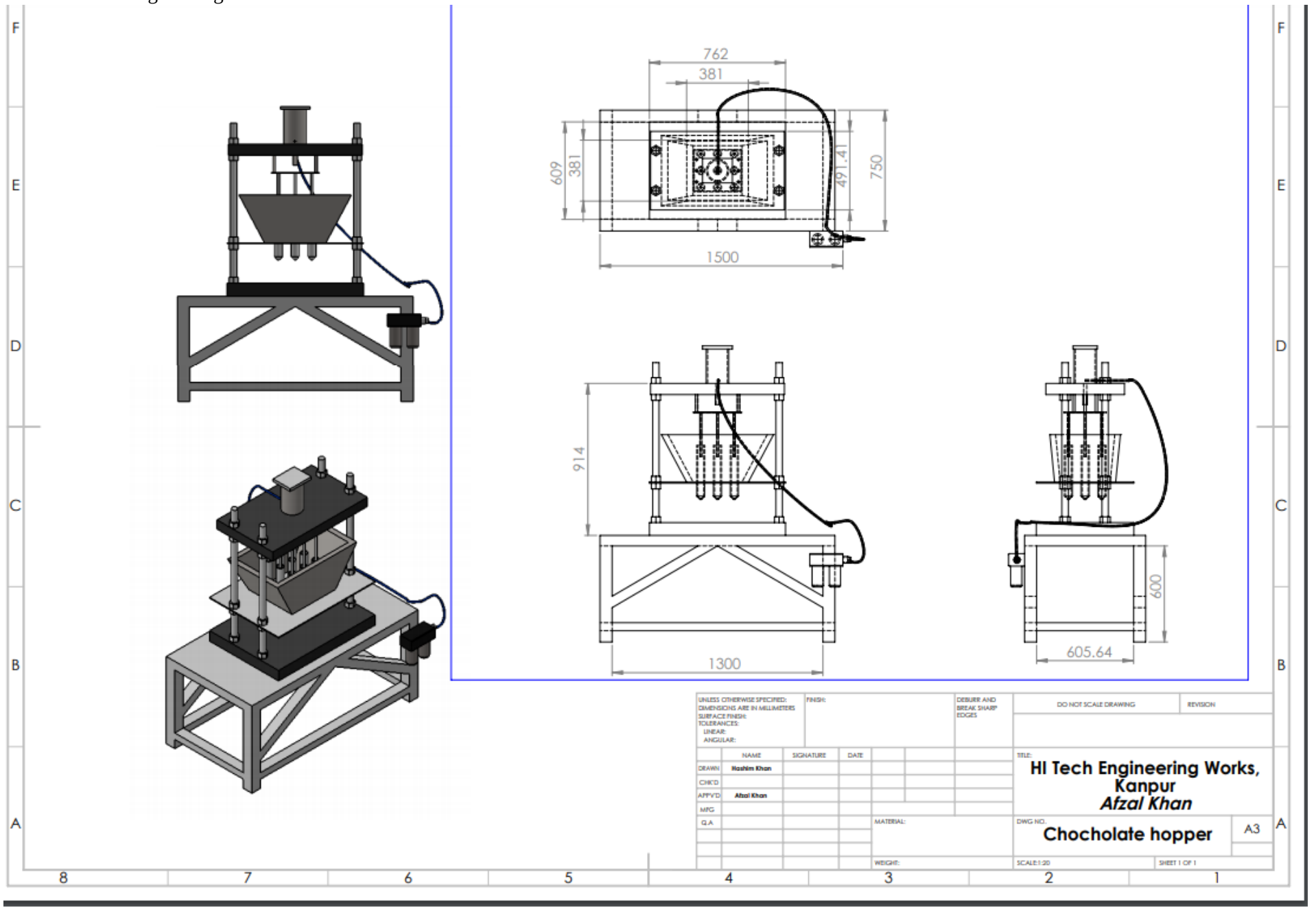
S.No	Specification
1	5 HP Motor
2	Gear Drive
3	Gear Drive with Control Panel
4	Temperature Controller
5	Jacket Size 2 inch(50mm)
6	Jacketed Tank With heater with temperature controller



This machine was designed to mix the chocolate powder and mix in prescribed proportion. This machine consists of 5 HP motor, reducing gear box of ratio 1:10, 4 mixing blades mounted on the shaft. The tank is jacketed type made up of SS304, food grade steel, and temperature controller.
This tank produces a thick mixture of chocolate which was feeded in a hopper and then to forming machine.

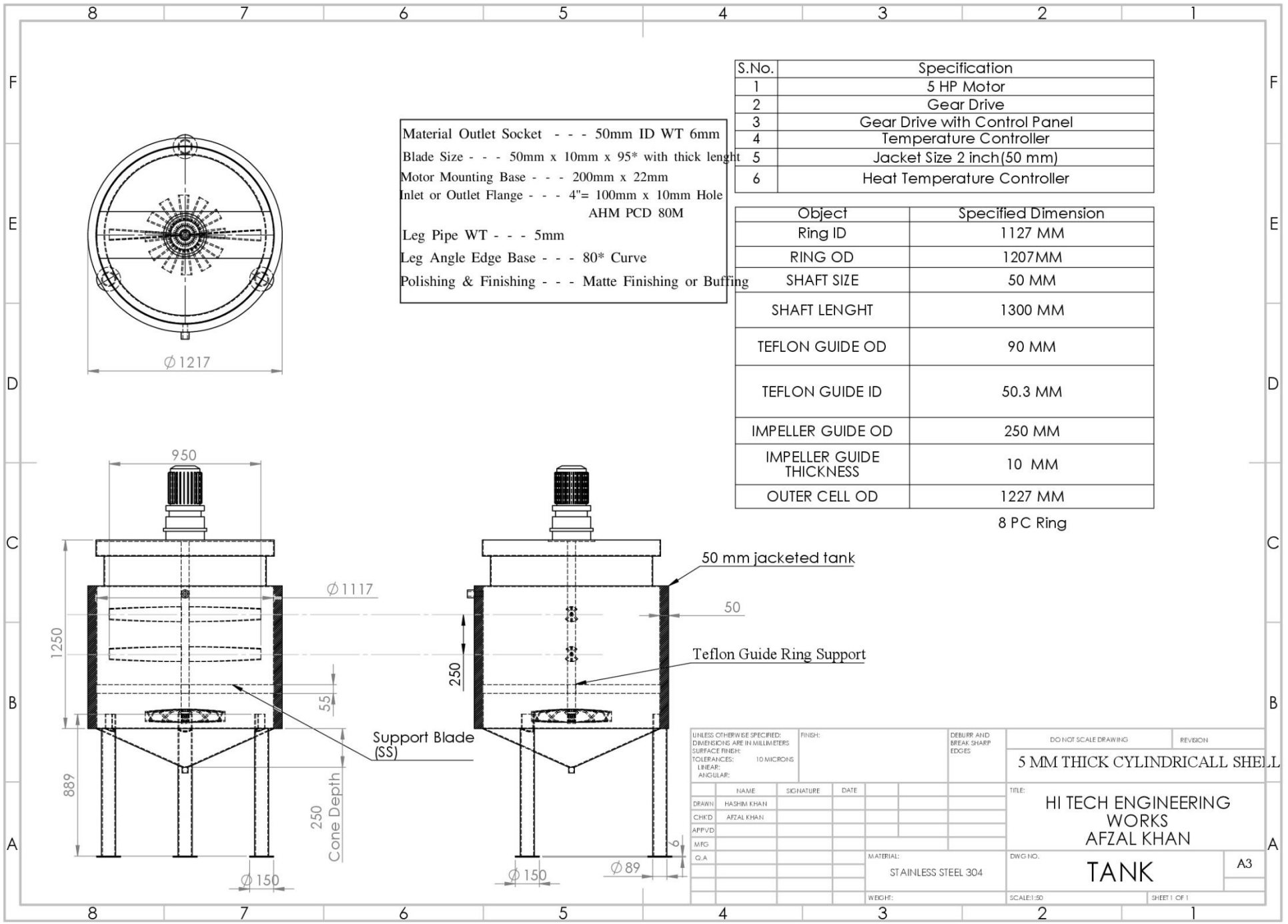
Chocolate Hopper Machine

Client- Hi tech Engineering

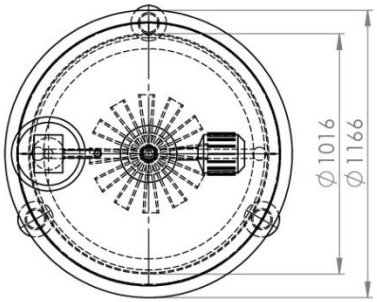


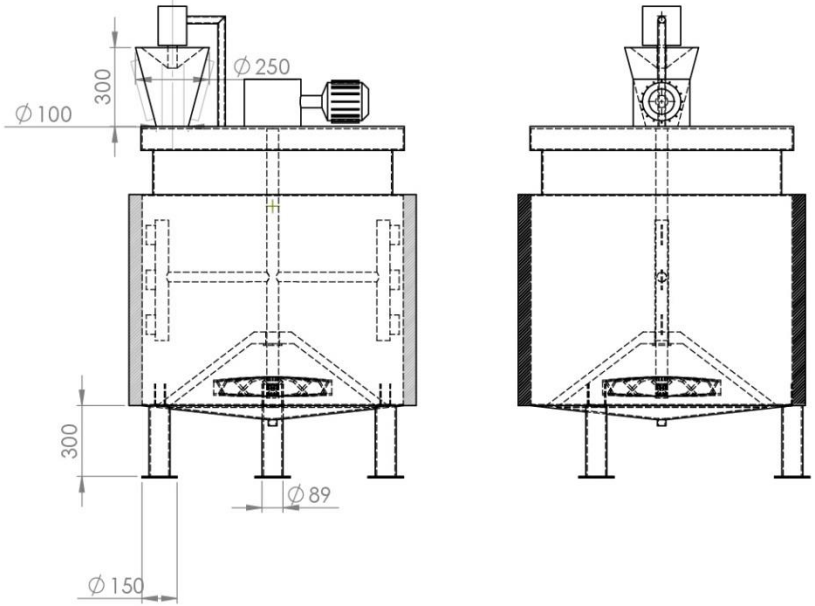
This machine was used to accumulate the chocolate mixture into 9 pipes for the process of forming of chips.

Mixing Tank
Client- Hi tech Engineering



Stirring tank
Client- Hi tech Engineering





S.No.	Specification
1	3 HP Geared Motor
2	Gear Drive
3	Gear Drive with Control Panel
4	Temperature Controller
5	Jacket Size 2 inch(50 mm)
6	Heat Temperature Controller
7	Air piston cylinder festo 85x100 stock for coconut drop

object	Dimension
Inner Cell	1016 mm
Outer Cell	1166mm
Leg height	300 mm
Leg OD	89 mm
Leg Base Plate	150mm
Hopper OD	250mm
Double Blade with teflon scrapper	6 PC
Material outlet Socket	89 mm WT 8 mm
Blade Size & Edge	60 mm x 95.6 edge with base block welding
Inlet or Outlet Socket or Flange	100 mmx 12 mm thick
PCD Size	80 mm 16 mm Hole
Leg pipe WT	8 mm
Leg Angle Edge	80* degree curve
Cylinder Mounting Plate	20 mm x 100 mm x 250 mm
Polishing Finishing	Matte Finishing or Buffing

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: 10 MICRONS LINEAR: ANGULAR:
FINISH:
DEBURR AND BREAK SHARP EDGES
DO NOT SCALE DRAWING
REVISION
5 MM THICK CYLINDRICALL SHELL

	NAME	SIGNATURE	DATE
DRAWN	HASHIM KHAN		
CHK'D	AFZAL KHAN		
APP'VD			
M'FG			
Q.A			

TITLE:
HI TECH ENGINEERING WORKS
AFZAL KHAN

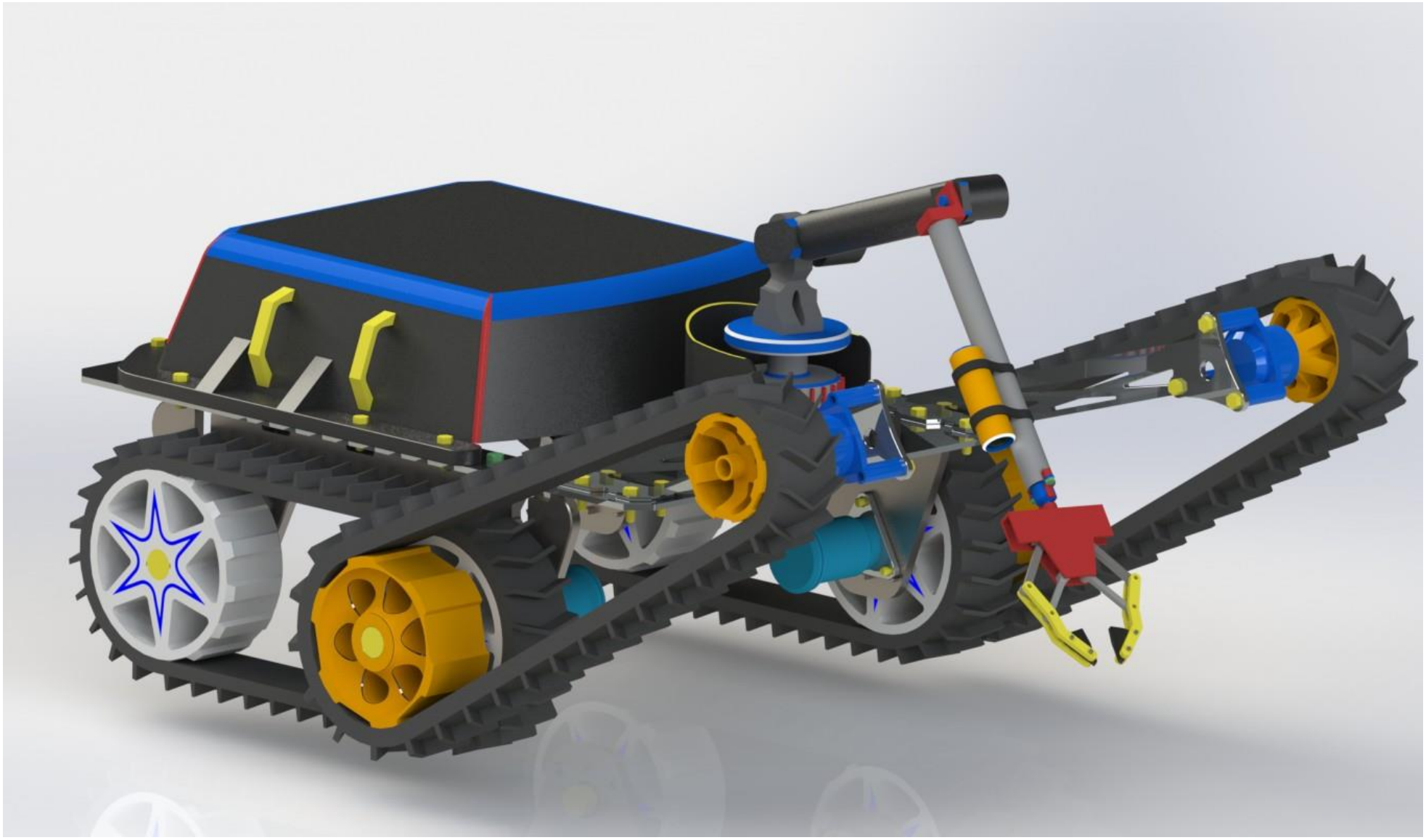
MATERIAL:
STAINLESS STEEL 304

DWG NO.
TANK

A3

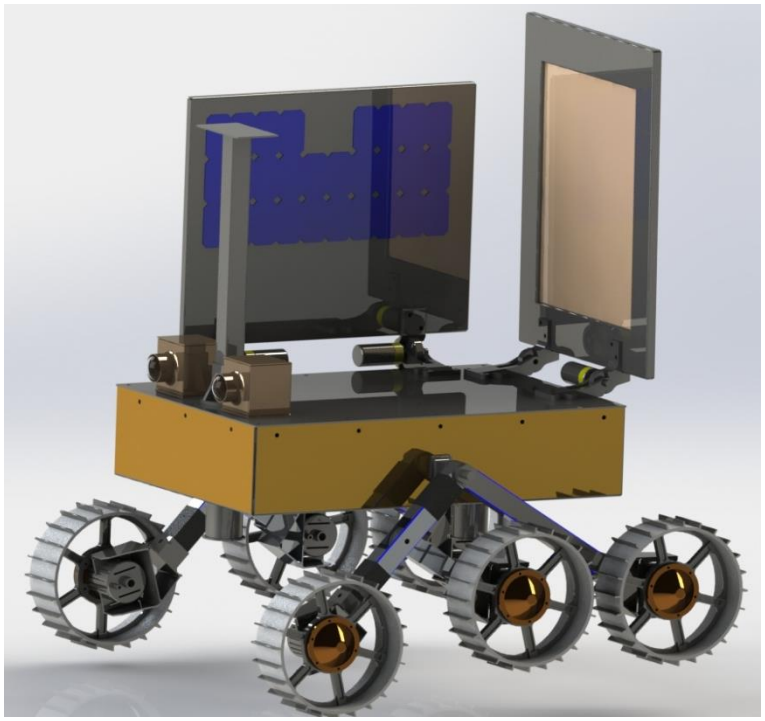
WEIGHT:
SCALE:1:20
SHEET 1 OF 1

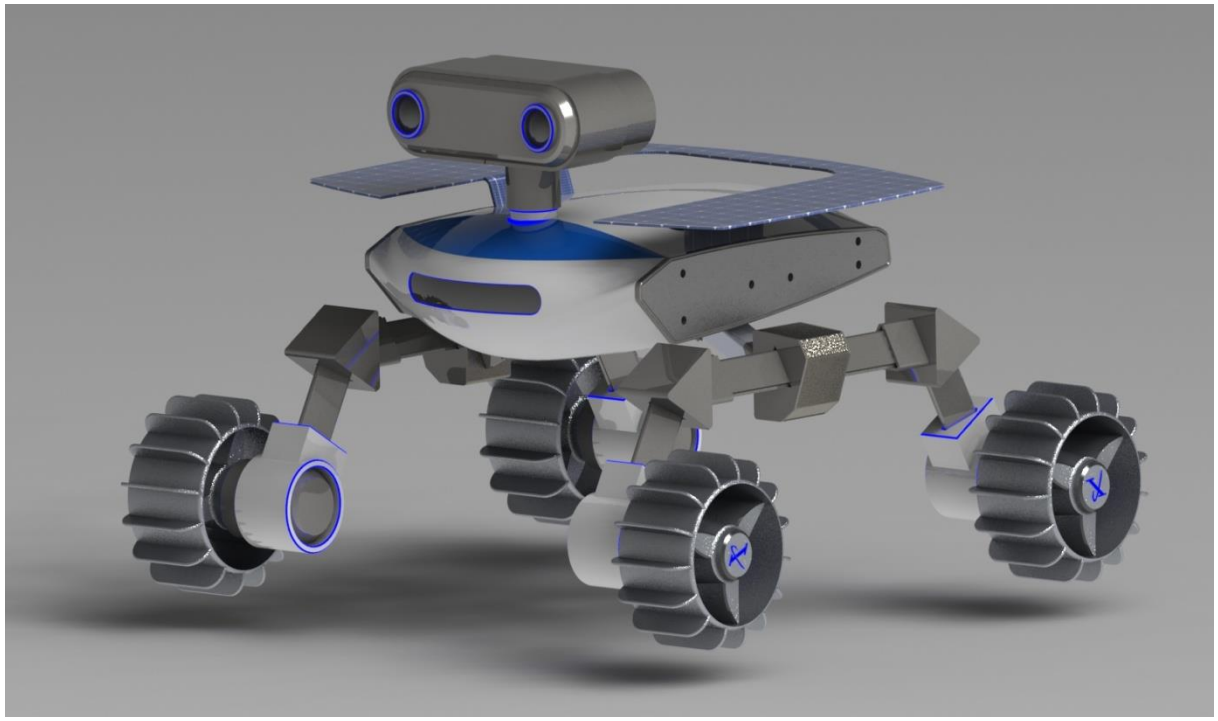
Bomb Diffusing Robot
Client- USMC, Startasys 3D printing Challenge

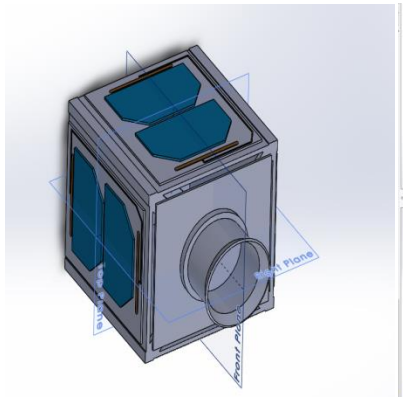


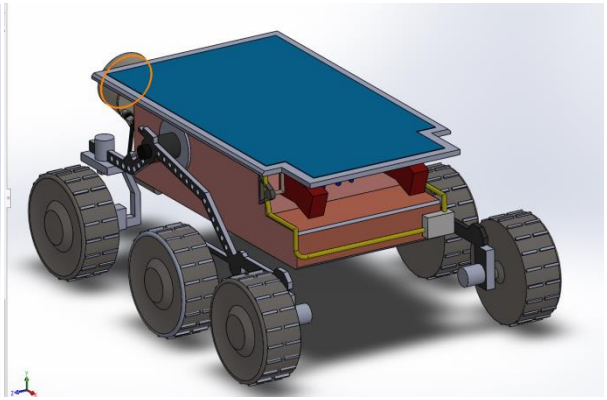
3D printing challenge hosted by Stratasys and USMC (United States Marine Corps) for the design and prototyping of bomb diffusing arm with camera , PIR, Near IR, Heat, Pressure, GPS, Gyroscope sensors. In this challenge I won 4th prize for the design of 3-DOF arm with effective reach and better griping system with pressure and detection feedback system.

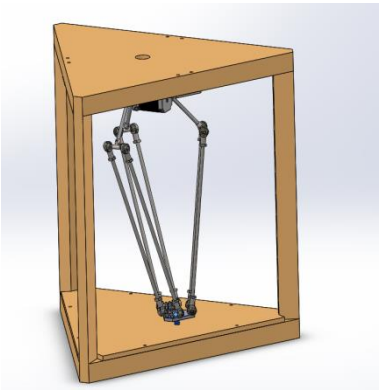
Robots (Static Model)
Client- Science city, DST, Ahmedabad

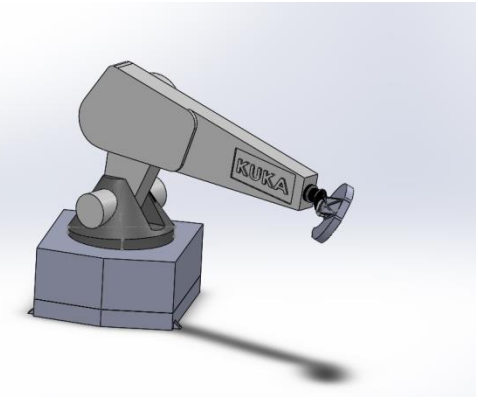








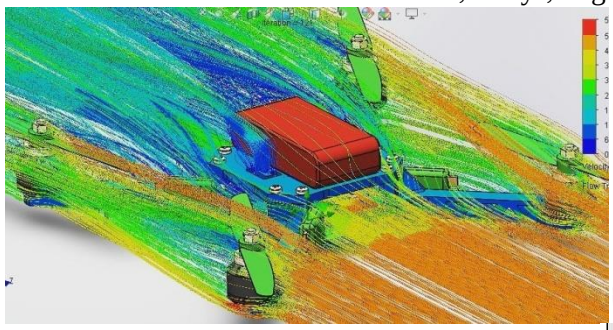


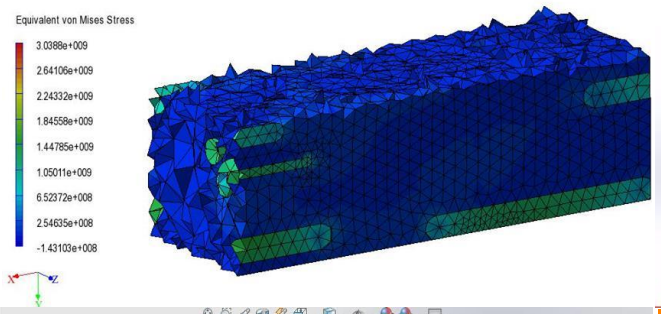


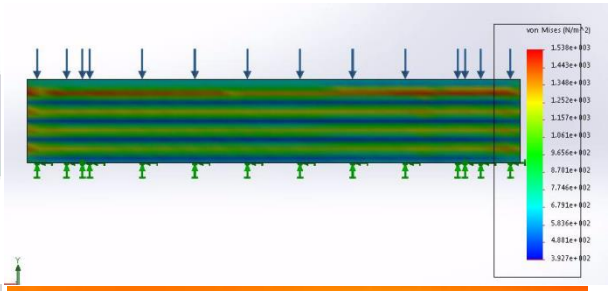
This is the static design of chandrayaan 2, Team Indus Rover for DST. There is total 63 robotics design in this project

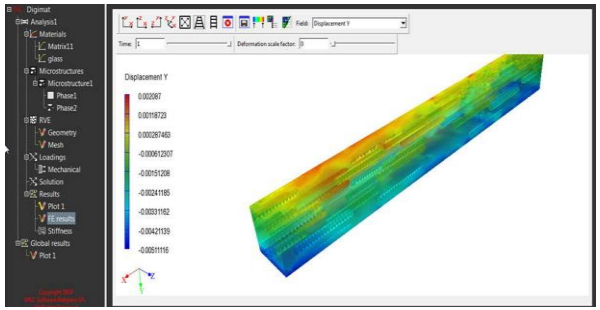
Simulations

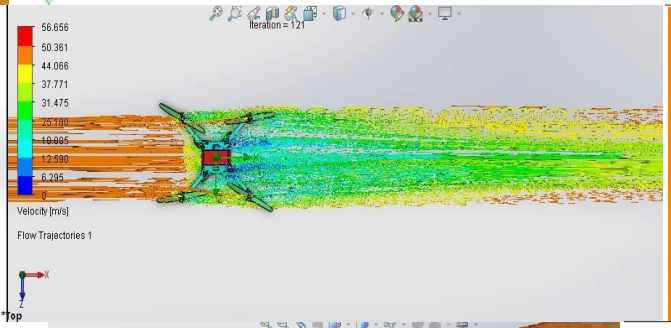
All simulations are done in Solidworks, Ansys, Digimat

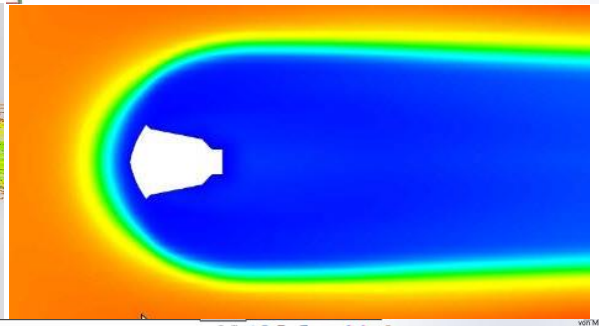


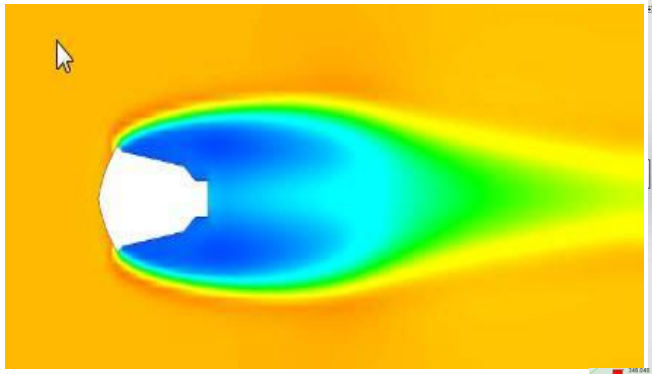


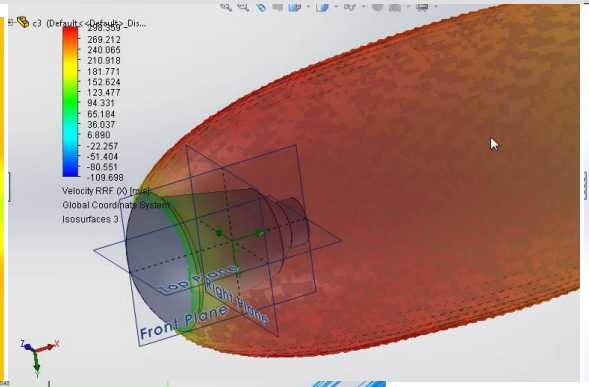


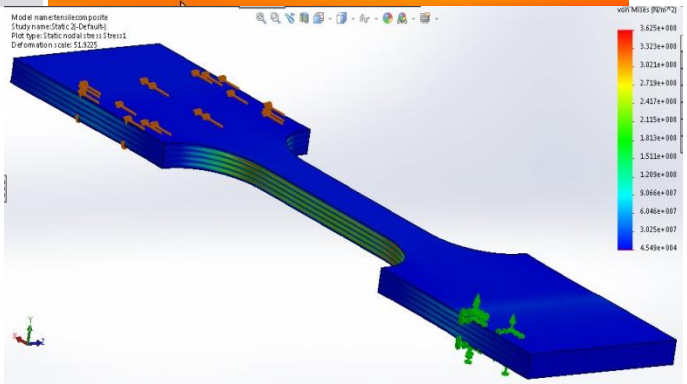


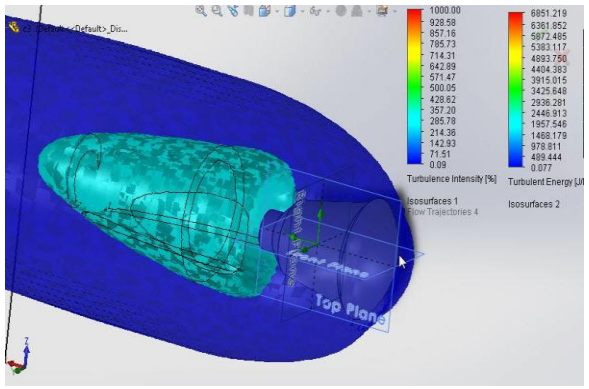


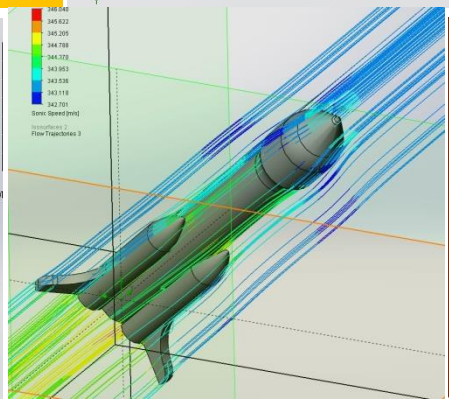


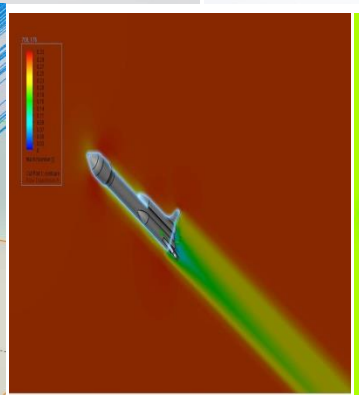


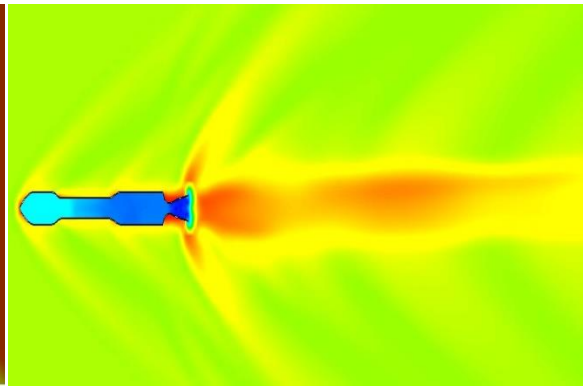




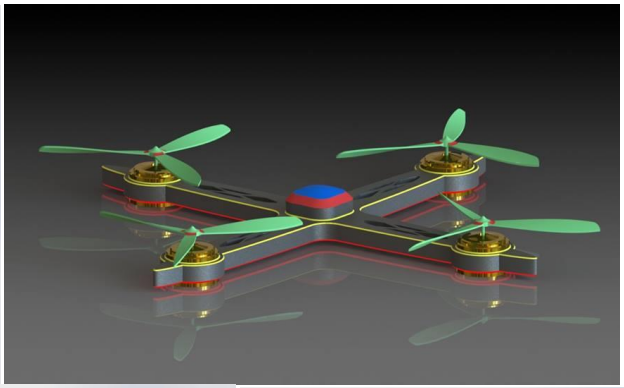




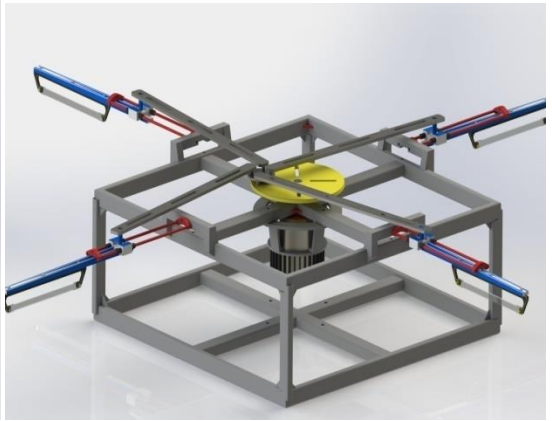
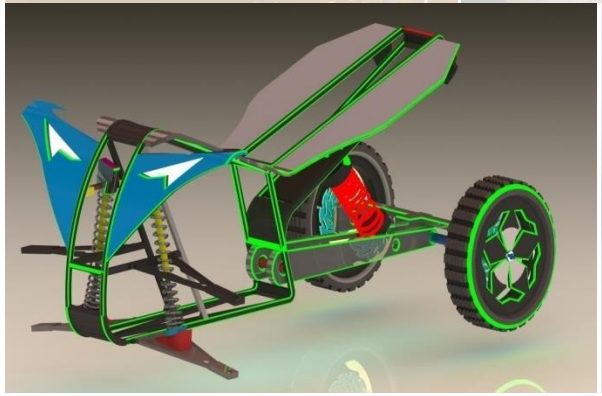
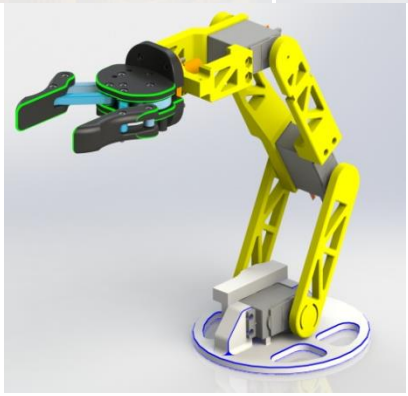
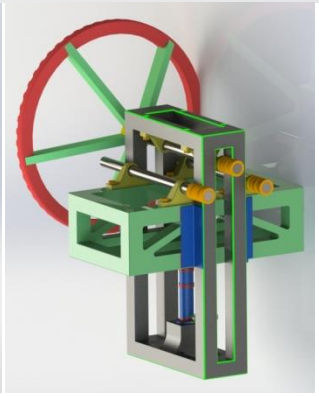
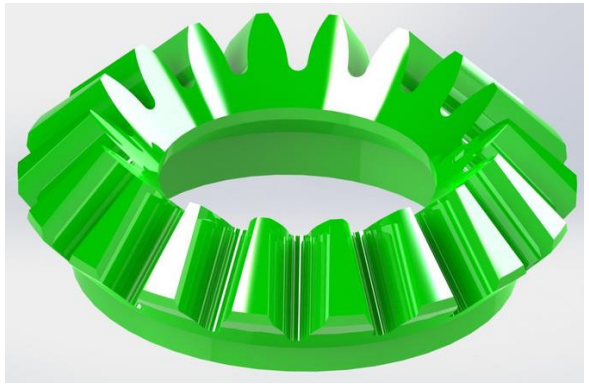




College Projects and Product Developments



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