MATTHIEU PERRET

MECHANICAL ENGINEER PORTFOLIO

ESILV
ENGINEERING SCHOOL
DE VINCI PARIS NANTES

Modeling and digital mechanics

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MATTHIEU PERRET | 22 years old

As a French engineering student at ESILV (Paris), I'm currently doing an end-of-study internship to finalize my studies in the mechanical engineering field. Specialized in modeling and digital mechanics, I'd like to put my skills to work for a company and continue developing them as well.

SKILLS

- Computer-Aided Design (CAD)
- Finite element calculations
- Mechanics (statics, dynamics, structures, materials)
- Aeronautics (aerodynamics, flight mechanics, fluid mechanics)
- Programming
- Organization, planning and project management
- Autonomy, rigor and adaptability

LANGUAGES

- French (native language)
- English (TOEFL iBT - 89/120 – B2 level)
- Spanish (entry-level)

TECHNICAL ENVIRONMENT

- CAD :
  Catia V5, SolidWorks, Enovia

- Calculations :
  Ansys WB, Abaqus, MATLAB-Simulink

- Programming :
  Python, C#, MySQL

- Methods :
  Design Thinking, brainstorming

- Pack office :
 Word, Excel, PowerPoint, Outlook, Teams

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CALCULATION ENGINEER
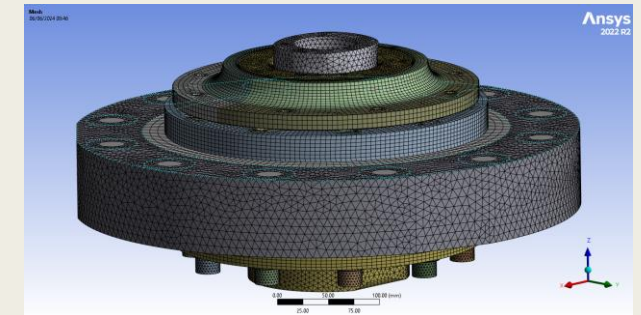
EXPLEO GROUP
Internship

GOALS AND ACHIEVEMENTS

6 months internship in Expleo Group, an engineering services company from France. There, I worked in the aeronautics sector with one of our biggest partners : Safran. My job was to design turbomachinery and run simulations on test benches. Using Ansys workbench, I used the finite element method to simulate the behavior of these systems. I also used Catia V5 to work on 3D parts in order to apply the best possible mesh (mainly hexa). In Ansys WB software I was able to work in depth on contacts, beams, design modeler, post processing... This internship made me a better engineer as it made me work on solving problems and adapt to clients' requirements. Finally, I had to send reports to the clients by using Pack Office and presenting my work with online meetings on Teams.
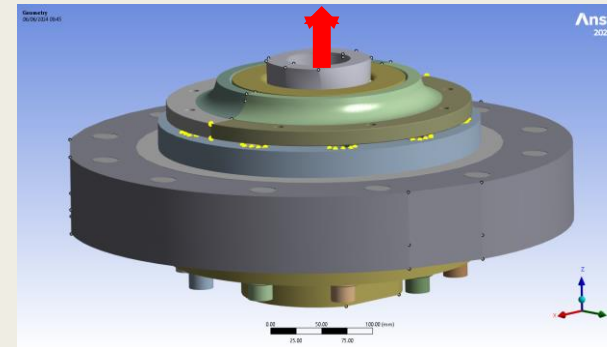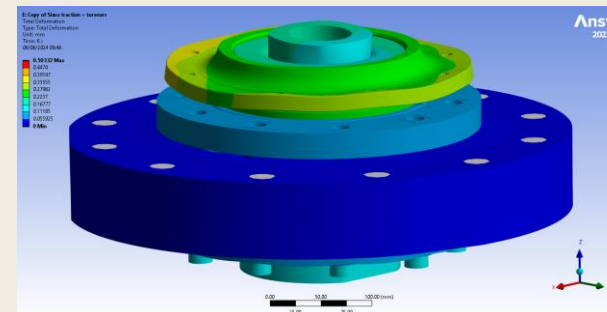

Test bench geometry

Mesh

Solution (deformation)

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CALCULATION ENGINEER

(expleo)

EXPLEO GROUP
Internship
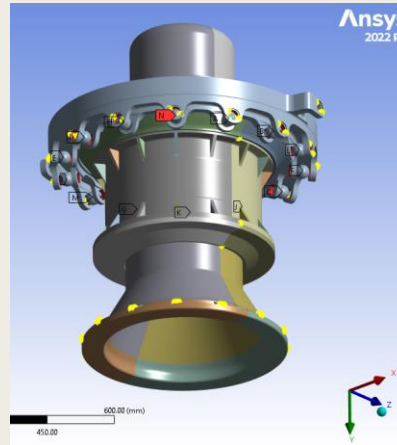
SKILLS DEVELOPED

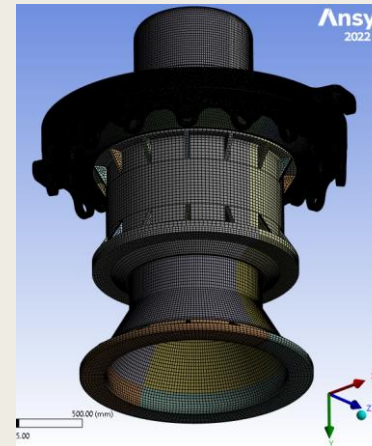Ansys WB
Catia V5
Design Modeler
Pack Office (Excel,
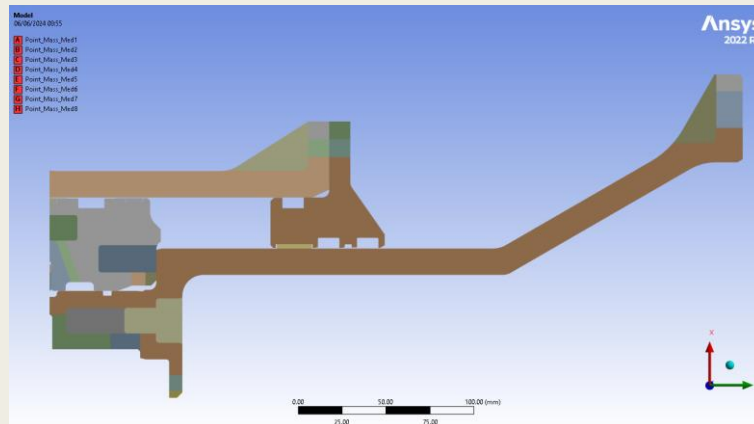PowerPoint, Word)
Aeronautic knowledge
Communication
Teamwork

3D actuator
geometry

Mesh
(hexa)

Solution
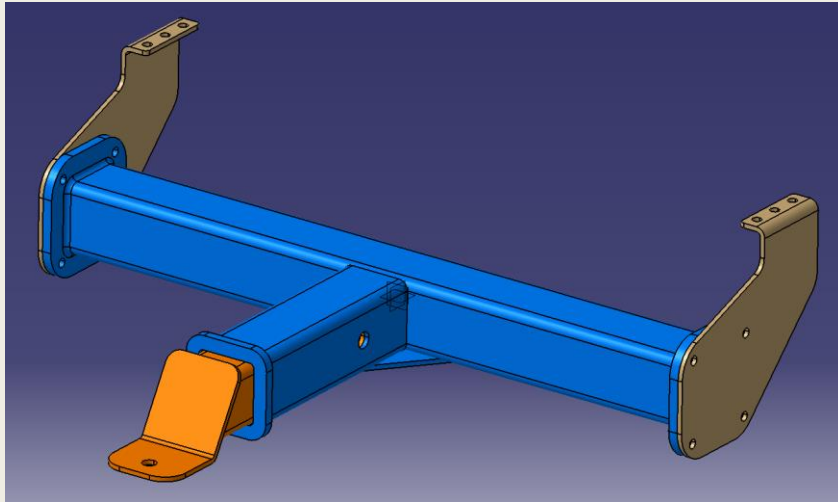(deformation)

2D actuator geometry

CATIA V5 UDEMY TRAINING
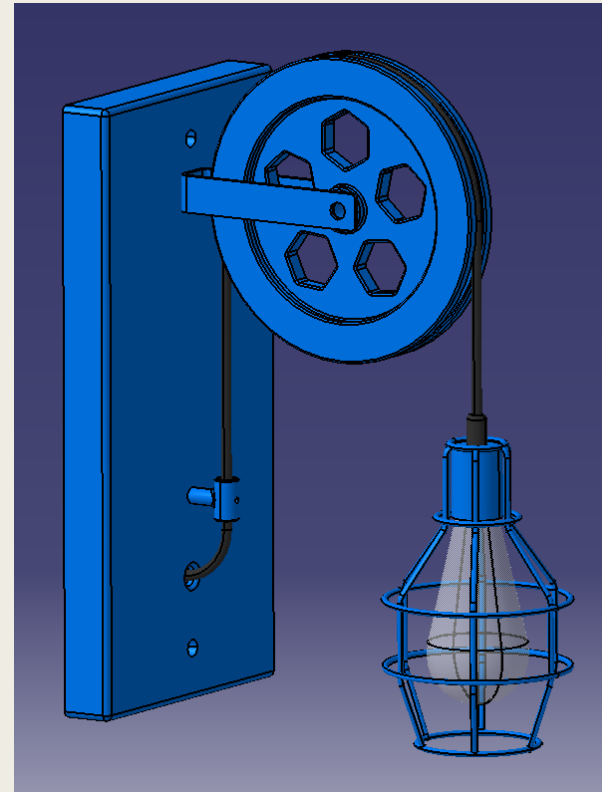
(expleo)

Trainer : Alexandru Bostan (from Alexander Consulting)
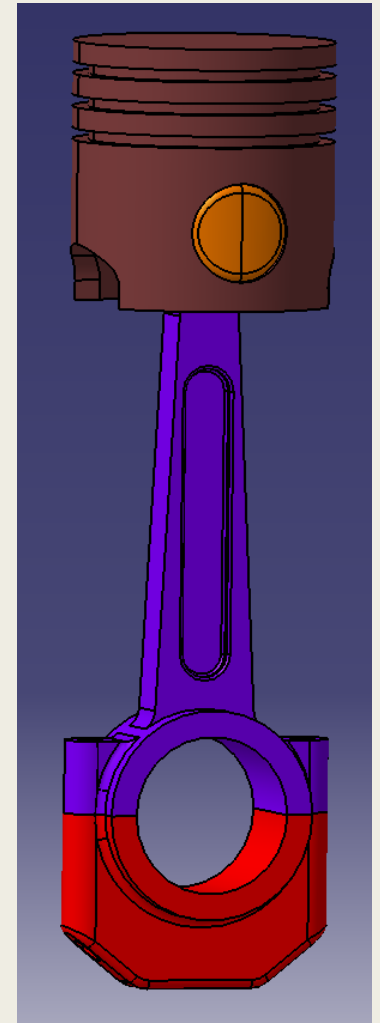
GOALS AND ACHIEVEMENTS

Training on all Catia V5 modes, with details of each tool and function. Realization of different exercises such as a piston assembly, a rustic lamp assembly and a towing hitch assembly.

Towing hitch

Rustic lamp

Piston

CATIA V5 UDEMY TRAINING

Trainer : Alexandru Bostan (from Alexander Consulting)
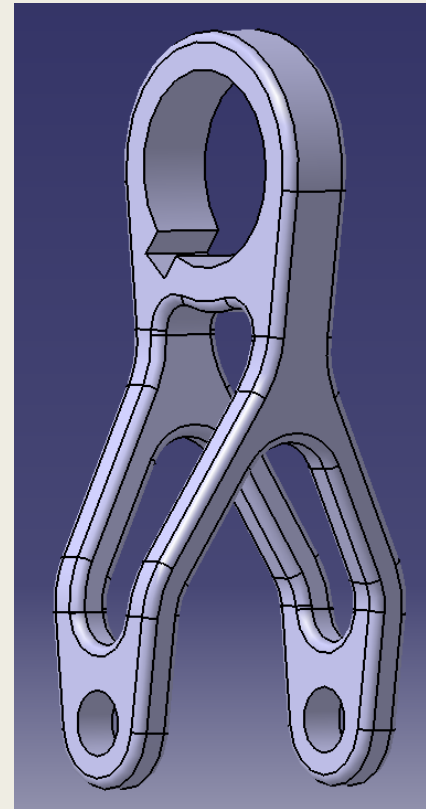
(**expleo**)

SKILLS DEVELOPED

Catia V5 :

Mechanical Design :
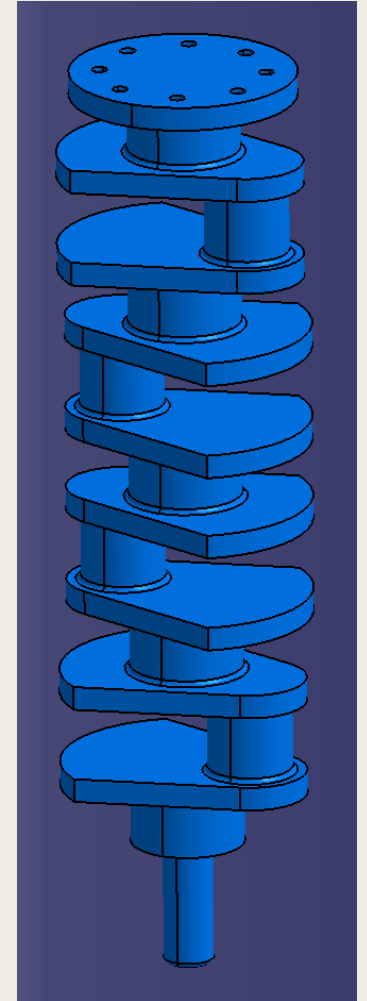   -Part design
    -Assembly Design
    -Sketcher
    -2D Layout for 3D Design
    -Drafting
    -Wireframe and Surface Design

Shape :
   -Generative Shape Design

Combine definition

Crankshaft

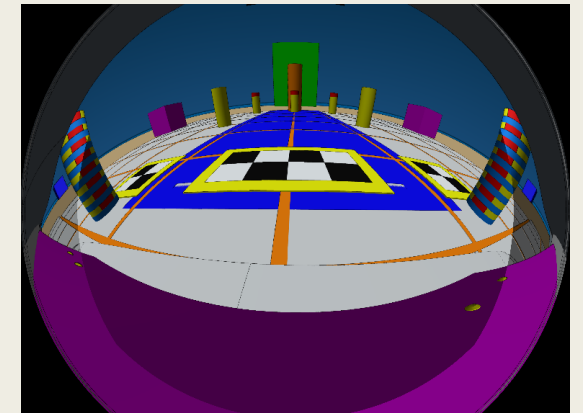# ELECTRONIC SYSTEMS INSTALLATION PILOT

BERTRANDT
Internship

bertrandt

GOALS AND ACHIEVEMENTS

4 months internship in Bertrandt, an engineering services company from Germany. There, I worked in the automotive sector with Renault Group car brand. My job was to install electronic systems like cameras, front and rear sensors, radars and other on latest Renault designs. I used Catia V5 and Enovia to install the systems and manipulate all the 3D vehicle environments. I also had to take screenshots of the installations and create PowerPoint and Word reports to justify each positioning according to precise rules and standards. My team was mainly made up of French engineers, but I also worked in English with Romanian engineers since Bertrandt has a branch there, this has helped me improve my English communication in the workplace.
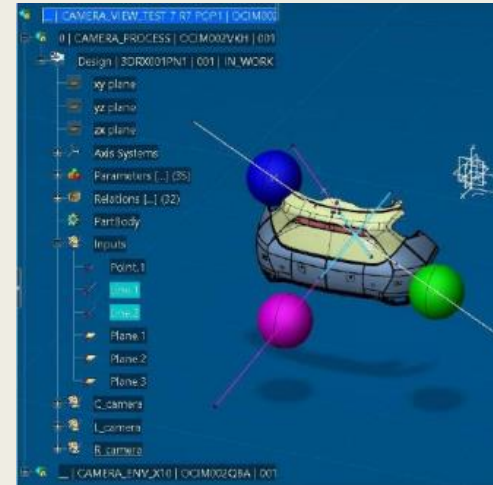
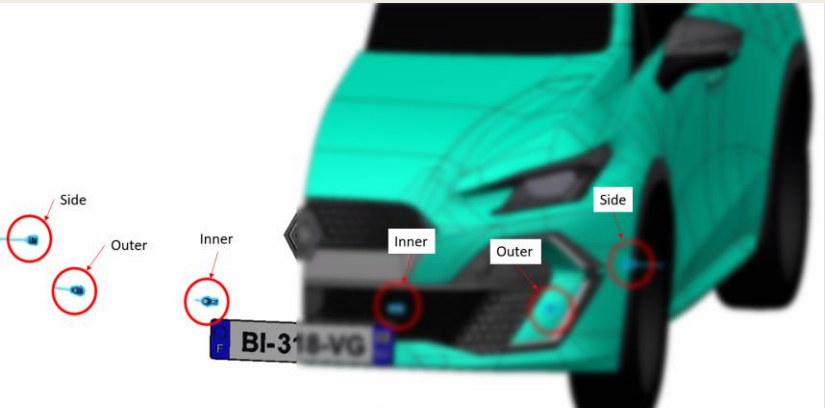Camera orientation

Camera simulation

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ELECTRONIC SYSTEMS INSTALLATION PILOT

BERTRANDT
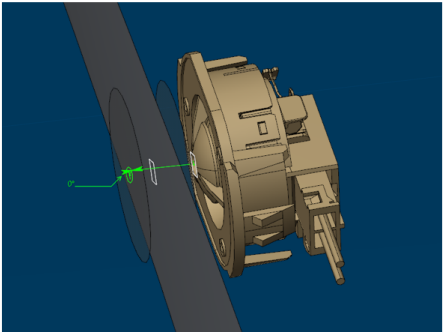Internship

bertrandt

SKILLS DEVELOPED
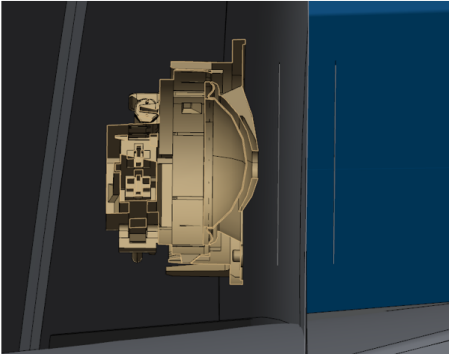
Enovia

Catia V5

Automotive knowledge

PowerPoint

Word

Communication

Teamwork

bertrandt

No.	Flexibility	Relative position to grid	STATUS
5	F2	The speaker must be flush in the grill on all the surface of the front body of the tweeter (flat surface) and remain parallel to this one. An acceptable tolerance deviation is +/- 6° for tweeters.	OK

Feedback DE-SII	tolerance +/- 6° is respected		
Action plan	angle is 0° (180°)	Pilot:	
JIRA→		Delay:	Confidential C

PowerPoint slide justifying one
sensor orientation

Sensor placement

AUTONOMOUS CAR

GOALS AND ACHIEVEMENTS

In a team of 4 students, our aim was to design an energy-autonomous car, from propulsion and regeneration systems to vehicle design, efficiency calculations and market study. We had to do all the upstream studies, stopping at prototyping. So, we set up 1 internal combustion engine coupled to 1 electric motor powered by regenerative braking, solar panels and a heat pump. We designed the vehicle body in Catia V5 and imported it into Ansys Fluent to calculate its drag coefficient and minimize it. After the study and calculations, we estimated that the vehicle could travel almost 1,000 km without stopping, thanks solely to its various regenerative systems.

SKILLS DEVELOPED

Catia V5
Ansys Fluent
Powertrain systems
Energy analysis
Team building
Market study

CENTRALIZING EVENT APPLICATION

GOALS AND ACHIEVEMENTS

In a team of 5 students, our aim was to develop any idea by drawing up a real specification in order to sell it to investors. Our idea was a mobile application for events, with a discussion, accounting and interactive map system. The idea was to centralize Google Maps, WhatsApp and Tricount in a single application. We detailed everything in a set of specifications and developed the basis of the application using C#, then presented the idea to investors in the school.

SKILLS DEVELOPED

Team building
Specifications
Programming
Project management

SPRINKLER ROBOT

GOALS AND ACHIEVEMENTS

In a team of 5 students, we set ourselves the challenge of designing a robot sprinkler, taking every aspect into account. We designed the body of the robot on SolidWorks for 3D printing, which had to accommodate the wiring, 2 motors (1 per wheel) and the Arduino board, as well as the water hose. We also designed the remote control on SolidWorks for 3D printing, with a 2nd Arduino board inside to drive the robot remotely. We also programmed these Arduino boards in C language. Coupled with radio signal transmitters/receivers, we were able to control the robot.

SPRINKLER ROBOT

SKILLS DEVELOPED

SolidWorks
3D printing
Machining
Programming
Arduino
Project management
Team building
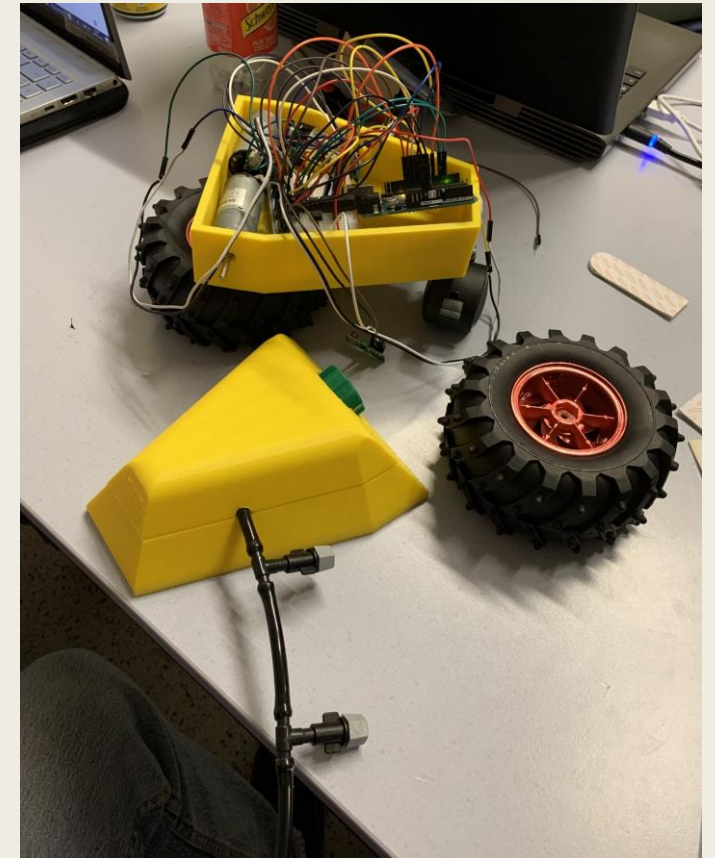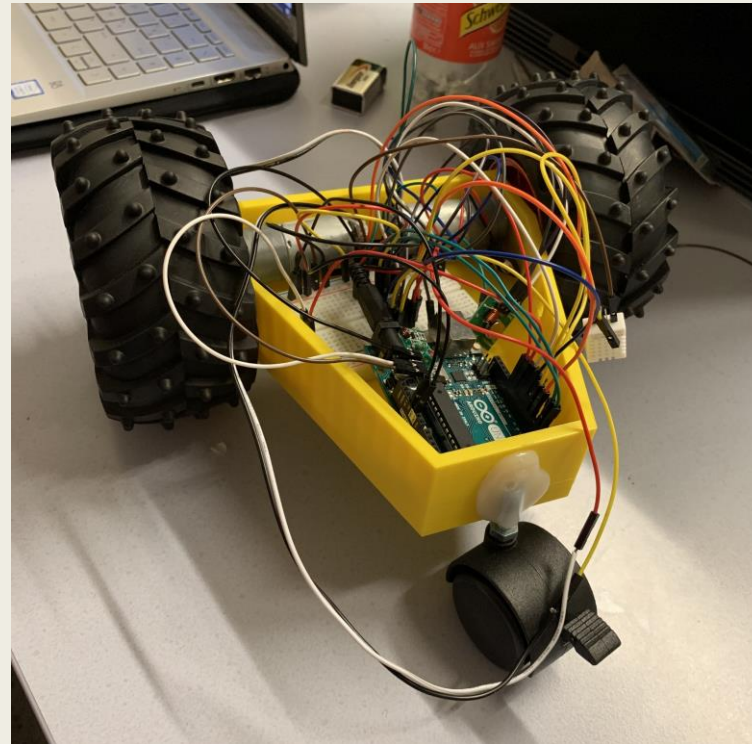
MOTOR CONSTRUCTION

GOALS AND ACHIEVEMENTS

In a group of 6 students, we had to design a motor by assembling the rotor, stator, magnets, coil, alternator and so on. We had a choice of materials and machining. The aim was to get the motor running. We chose to 3D print the rotor and stator after designing in SolidWorks. Then we assembled the whole thing with the right current voltage for the targeted Laplace force, in order to achieve a minimum motor rotation speed.

SKILLS DEVELOPED

SolidWorks
3D printing
Machining
Motor operation
Team building