LUCAS HENRIQUE SILVA DE ALCÂNTARA

MECHANICAL ENGINEER

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(31) 99810 - 2455

QUALIFICATIONS

- Experience in 3D and 2D modeling with GD&T in SolidWorks, Inventor, Fusion, OnShape and Siemens NX, incorporating DFM/DFA principles.
- Experience in the following areas: aerospace, naval and robotics.
- Proficient in communicating with suppliers and cross-functional teams to resolve design issues and identify improvement opportunities.
- Experience in designing and manufacturing parts/components for CNC machining and 3D printing.
- Experience with SQL data analysis.

EXPERIENCE

LUZA GROUP | Knowledge Based Engineering (KBE)

Set 2025 - Present

- Automated design processes in Siemens NX (KBE), significantly accelerating section updates compared to traditional explicit modeling methods.
- Designed with Body-in-White and Interior Trim components in vehicle section development.
- Treated and optimized Class A surfaces.

Laboratory of Experimental Analysis and System Simulation LAESS | Mechanical Design

Mar 2022 - Jul 2024

- Photogrammetry of parts for later conversion of these points into point clouds, mesh, and 3D CAD model – Autodesk ReCap Photo and others.
- Test setup and execution – aircraft springs.
- Calculation of spring constants and their respective uncertainties based on experimental data.
- Modeling – aircraft parts.
- Landing gear modeling.
- Static simulation, transient simulation, flexible body dynamic simulation, and fluid simulation.
- Data analysis using Excel.
- Use of Python for data analysis.
- Prepared periodic technical reports.
- Training of team members.

Scientific initiation | Control and Design

Mar 2024 - Mar 2025

- Development and testing of a satellite attitude control platform.
- 3D modeling of the platform.
- Manufacturing of the platform's structural parts using filament and resin 3D printers.
- Use of various electronic components on the platform.
- Development of the platform's control code.
- Real-time testing of the control software.

Robot Competition Team | Mechanical Design

Nov 2021 - Feb 2025

- Modelagem 3D em software CAD (Inventor e Solidworks), do robô de 13.6 kg,
- Simulação de componentes mecânicos dos modelos;
- Seleção de material.
- Coordenador da fabricação e do projeto do robô.

EDUCATION

UNIVERSIDADE FEDERAL DE OURO PRETO

Bachelor's Degree in Mechanical Engineering

Jan 2020 - Mar 2025

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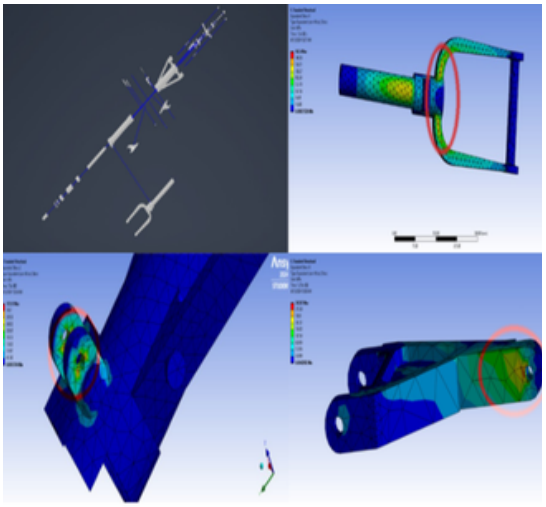
LANDING GEAR - PROJECT FOR THE BRAZILIAN AIR FORCE

Mar 2022 - Jul 2024



What?

- Model and create an assembly animation of the landing gear parts.
- Run a dynamic simulation of the landing gear to identify areas of highest stress, so that these regions can receive more frequent maintenance.

How?

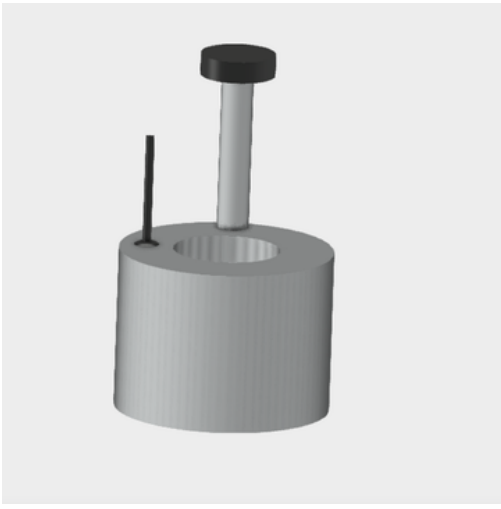
- **Autodesk Inventor** and **SpaceClaim (Ansys)** software were used for the design of the parts.
- The **dynamic and nonlinear analysis** of the landing gear was performed in the **Transient Structural** and **Explicit Dynamics** modules of Ansys.

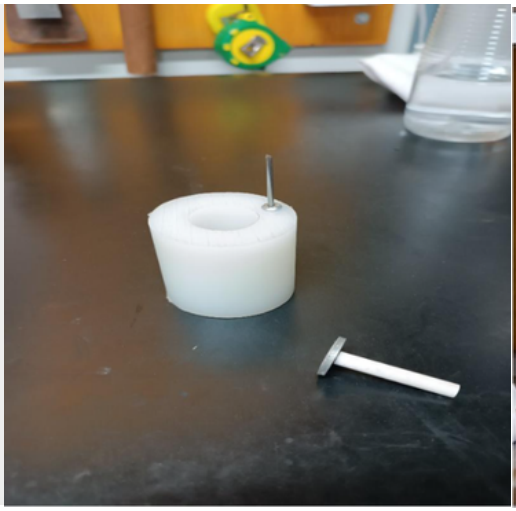
Results

- The animation was fully completed, Thus facilitating the assembly process of the part.
- The areas of highest stress were identified.

AIRCRAFT SPRINGS - PROJECT FOR THE BRAZILIAN AIR FORCE

Mar 2022 - Jul 2024





What?

- Model and manufacture the parts required for the spring testing.
- Conduct spring compression tests and collect data.
- Compare the results of the elastic constants obtained during the tests with the spring constants provided by the spring manufacturers.

How?

- **Autodesk Fusion 360** software was used for the design of the parts, and the Creality CR-10S 3D printer, as well as a bench drill, were used for the fabrication of the parts.
- During the test, a dial indicator and a dynamometer were used in the experiment.
- The data was analyzed using **Python** and **Excel**.

Results

- The comparison of the results was performed, and the report was completed.

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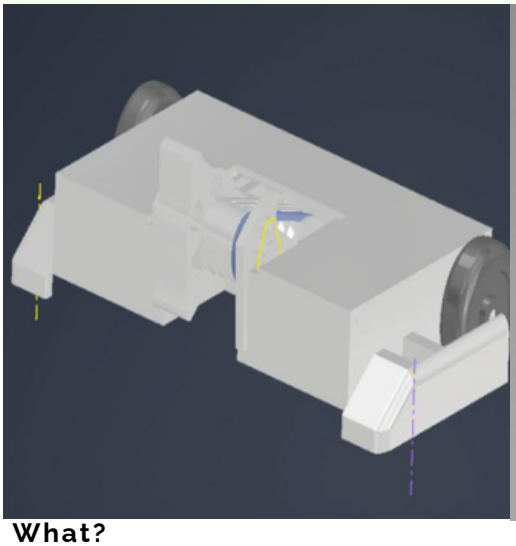
ROBOT - PROJECT FOR THE ROBOTICS TEAM

Nov 2021 - Feb 2025



What?

- Dimensioning the machine elements of the robot.
- Model and manufacture a robot in the 13.6 kg category.
- Perform a dynamic simulation of the robot's structure to determine which geometry favors greater mechanical resistance.

How?

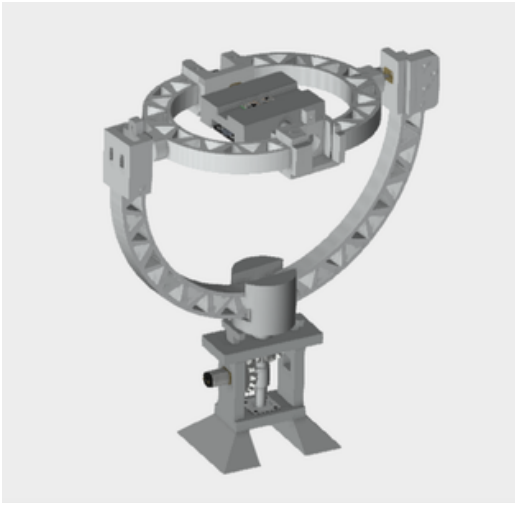
- For the dimensioning of each element, **Jupyter Python** was used.
- **Autodesk Inventor** and **Fusion 360** software were used for the design of the parts.
- The **dynamic and nonlinear analysis** of the robot was performed in the **Explicit Dynamics** module of Ansys.
- The parts were manufactured using a 3D printer and machining.

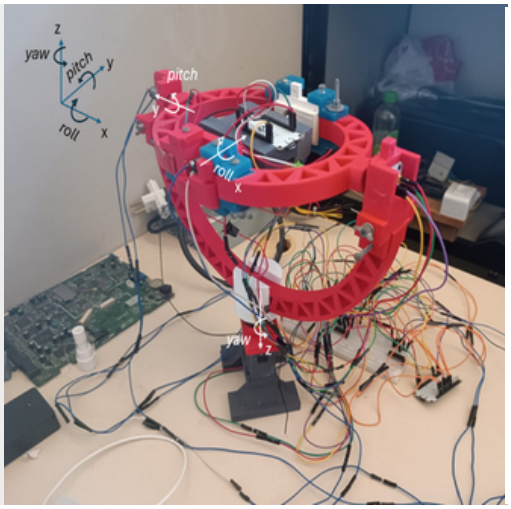
Results

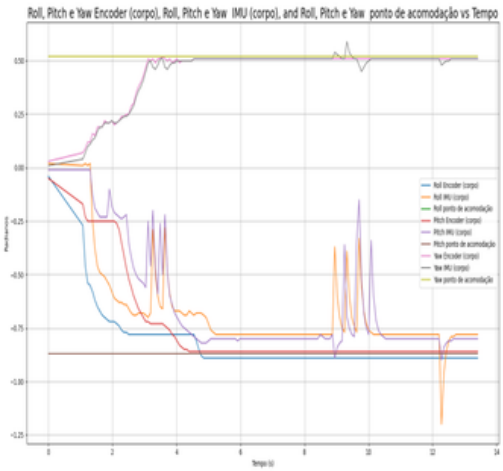
- The prototype manufacturing process is being finalized.

GIMBAL PLATFORM - RESEARCH PROJECT

Mar 2024 - Mar 2025







What?

- Model and manufacture the parts required for the platform.
- Acquire the electronic components and assemble the platform.
- Model the dynamic system of the platform.
- Develop the platform's software.
- Test the entire system in real-time.

How?

- **Autodesk Fusion 360** and **Inventor** software were used for the design of the parts. The Ender 3 S1 3D printer and a CNC lathe were used for the fabrication of the parts.
- The dynamic model of the platform controller was developed in **MATLAB** and **Python**.
- The control code was implemented on the **Arduino IDE** platform in **C++.**

Results

- The control of the platform prototype had an extremely fast response time (less than 3 seconds).
- During testing with the prototype, the system did not experience overshoot.
- The settling error was less than 2% (98% accuracy).