SOLAR TRAKER

REALIZATION OF THE TWO ARMS ALLOWING A HORIZONTAL ORIENTATION AND A VERTICAL ORIENTATION

THIERRY LOUIS

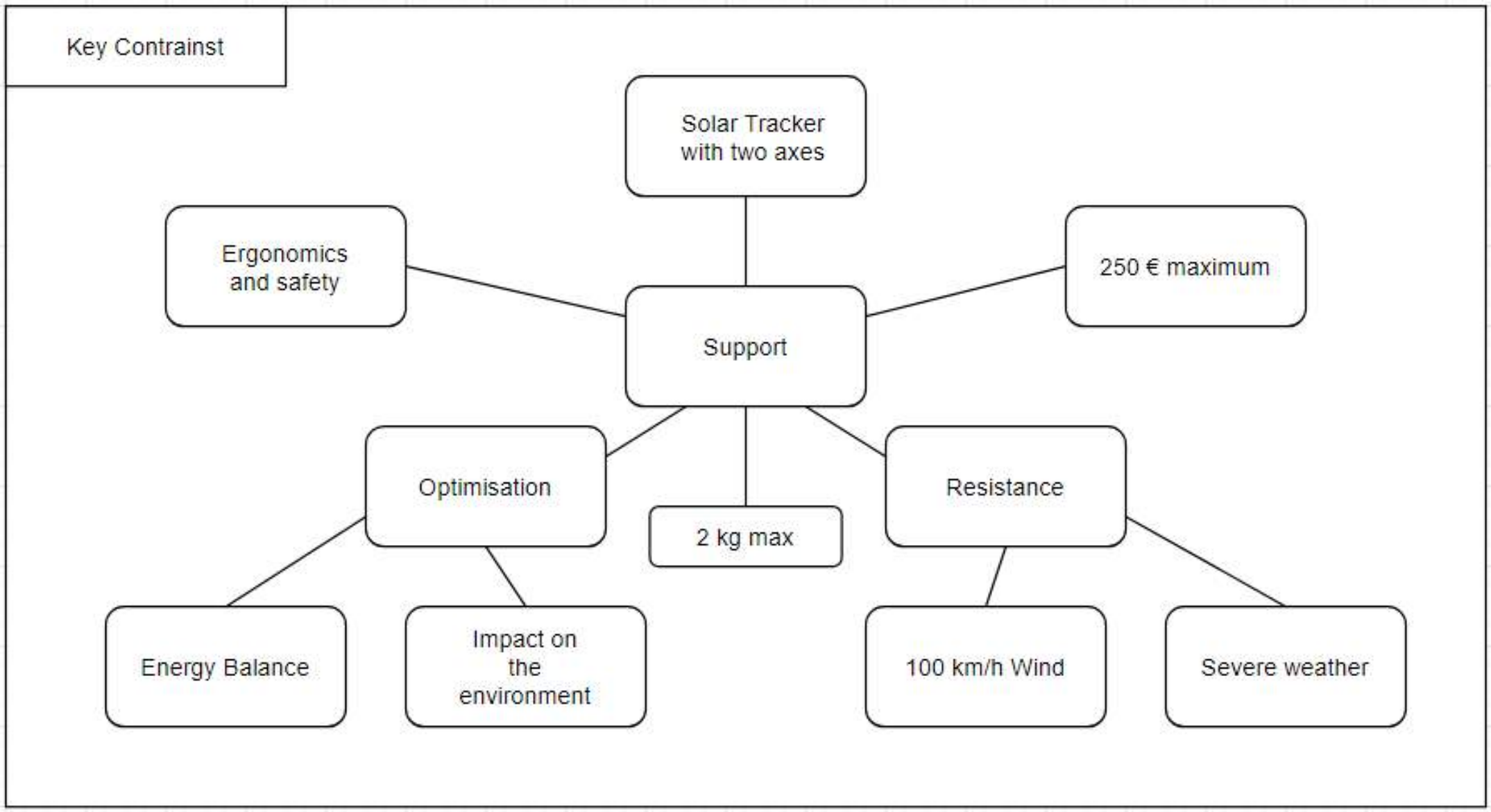
SUMMARY

- Presentation of the project
- Key Constraints
- Planning with software
- Standards and Patents
- Requirement diagram
- Sketches and Modeling
- Chosen solution
- Materials Used

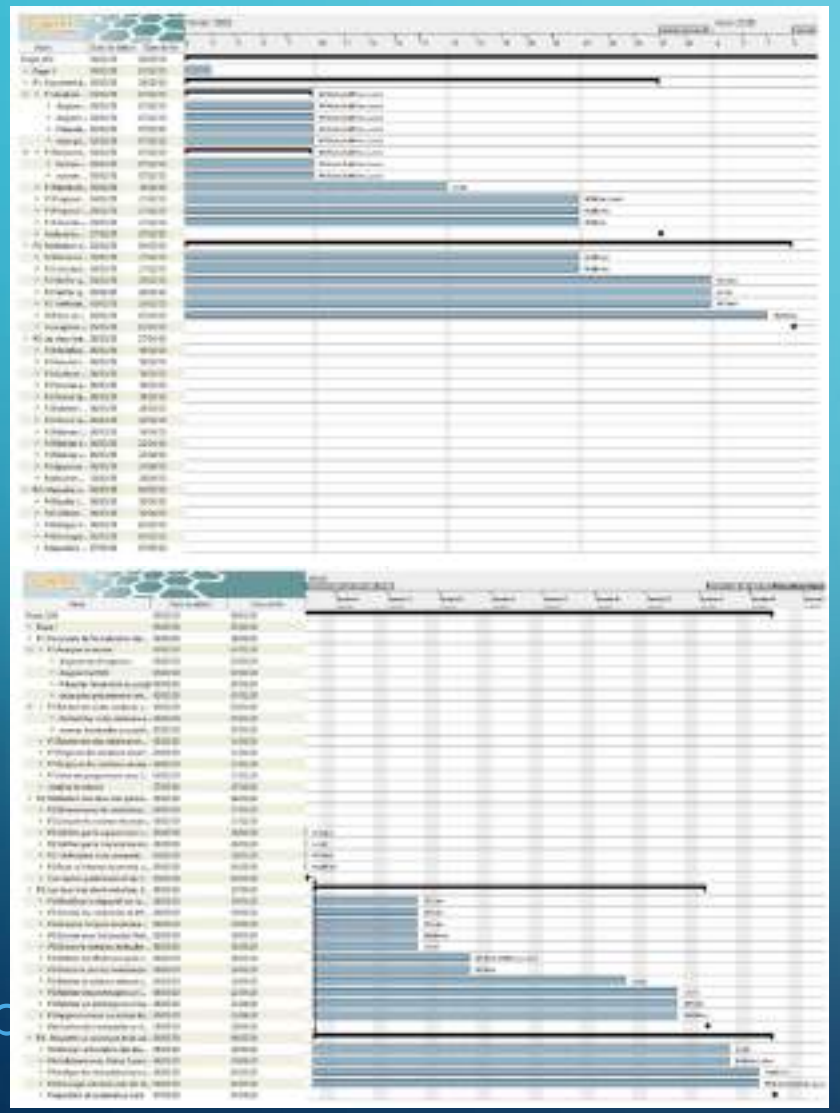
PRESENTATION OF THE PROJECT

- We have a mobile home with a fixed solar panel and we would like this panel to be mobile and follow the sun to produce more electricity.
- So I have to make a support for an existing solar panel that can follow the sun.

KEY CONSTRAINTS



PLANNING WITH SOFTWARE



Step 1 :
Analysis of the need.
Monday January 27 until Monday February 3.

Step 2 :
Preliminary Conception.
Friday February 7 until early March.

Step 3 :
Prototype Production.
Mid-March until the end of april.

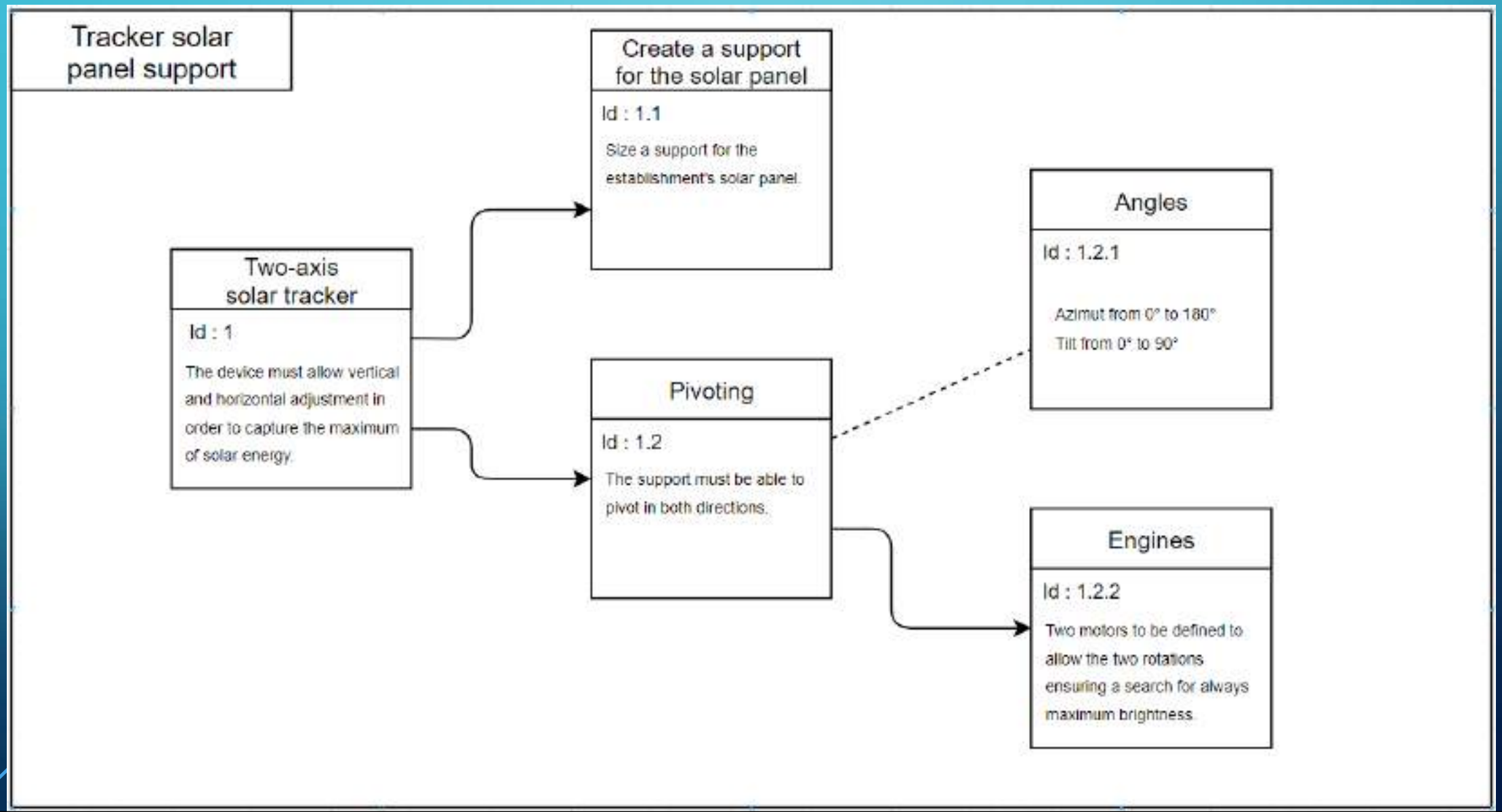
Step 4 :
Preparation and oral.
Mid-March until the end of April.

STANDARDS AND PATENTS

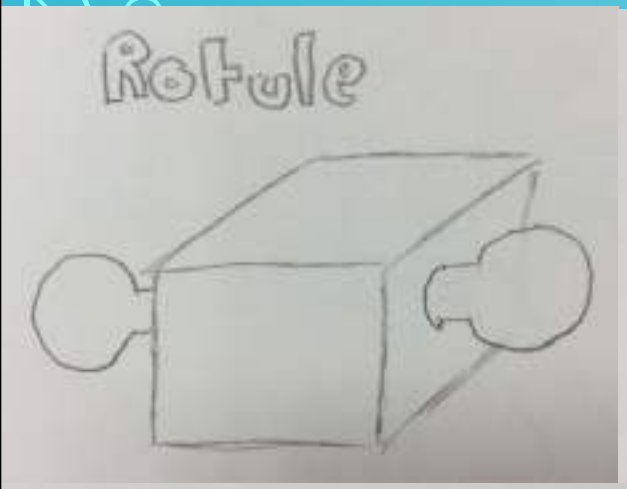
- **I found 3 standard on the INPI website :**
- One with ball joints but it doesn't help us.
- One with gear, this kind of patent interests us because we have gears in the arms of the support.
- And one with wheels, but it's too big and not suitable for our project.

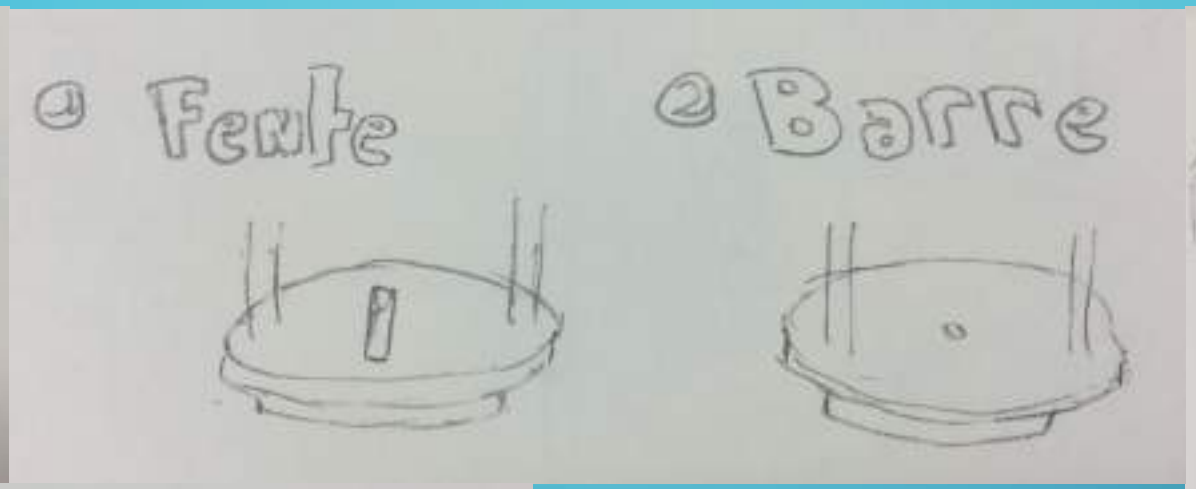
- **I found 2 patents for this project :**
- One for the base, for the struture : PD CEN/TR 16999:2019
- One for the solar panel : NF EN 60904-2 Mai 2015

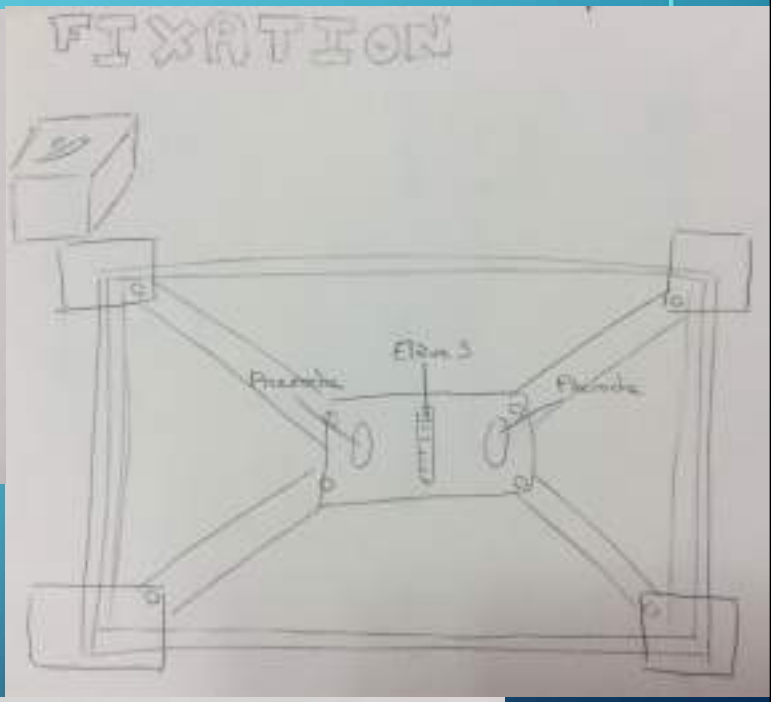
REQUIREMENT DIAGRAM

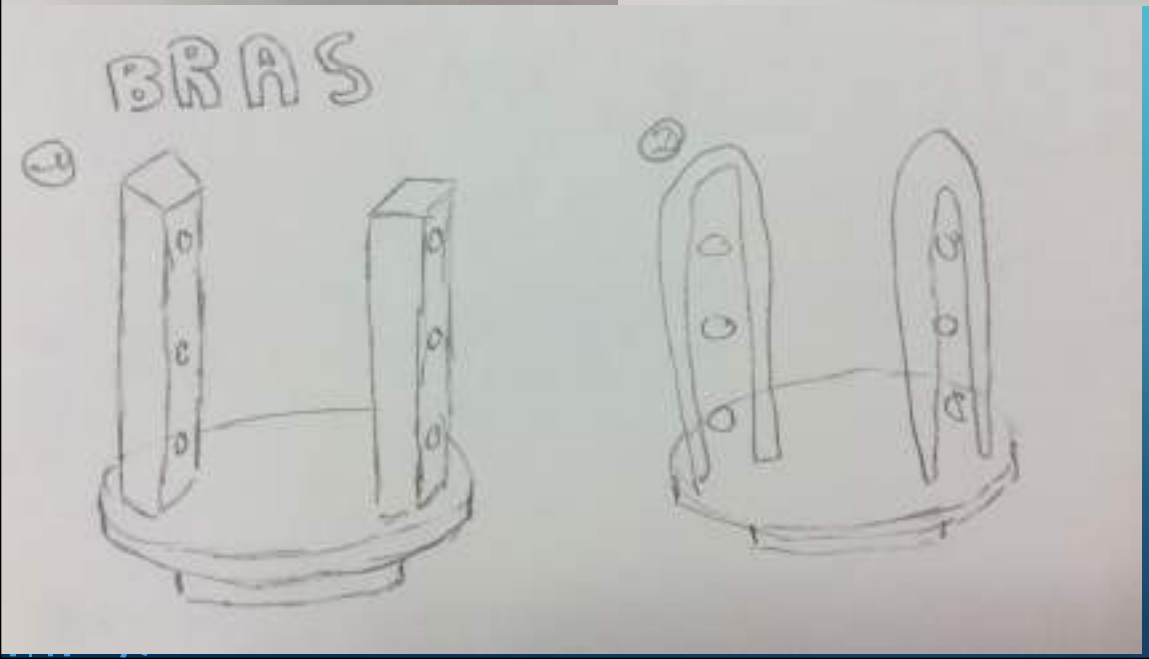


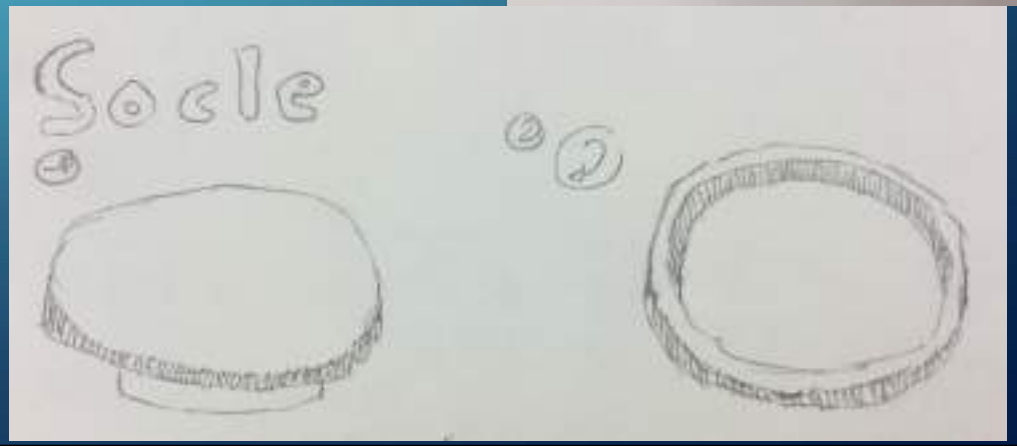
SOLUTION WITH SKETCH



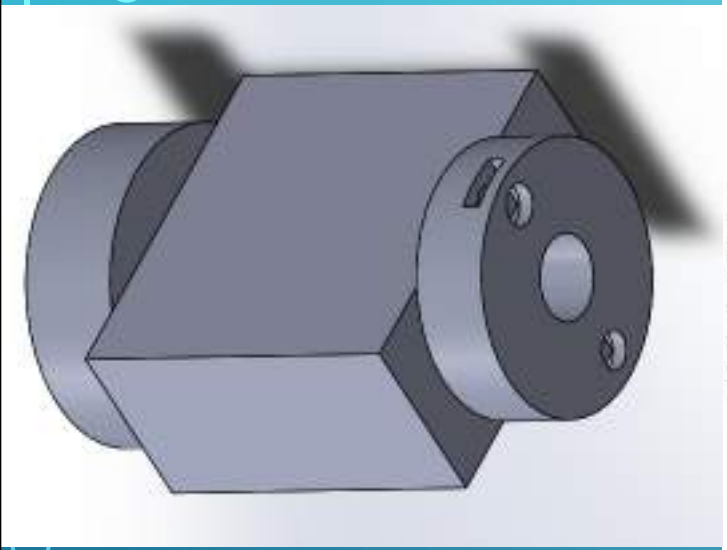


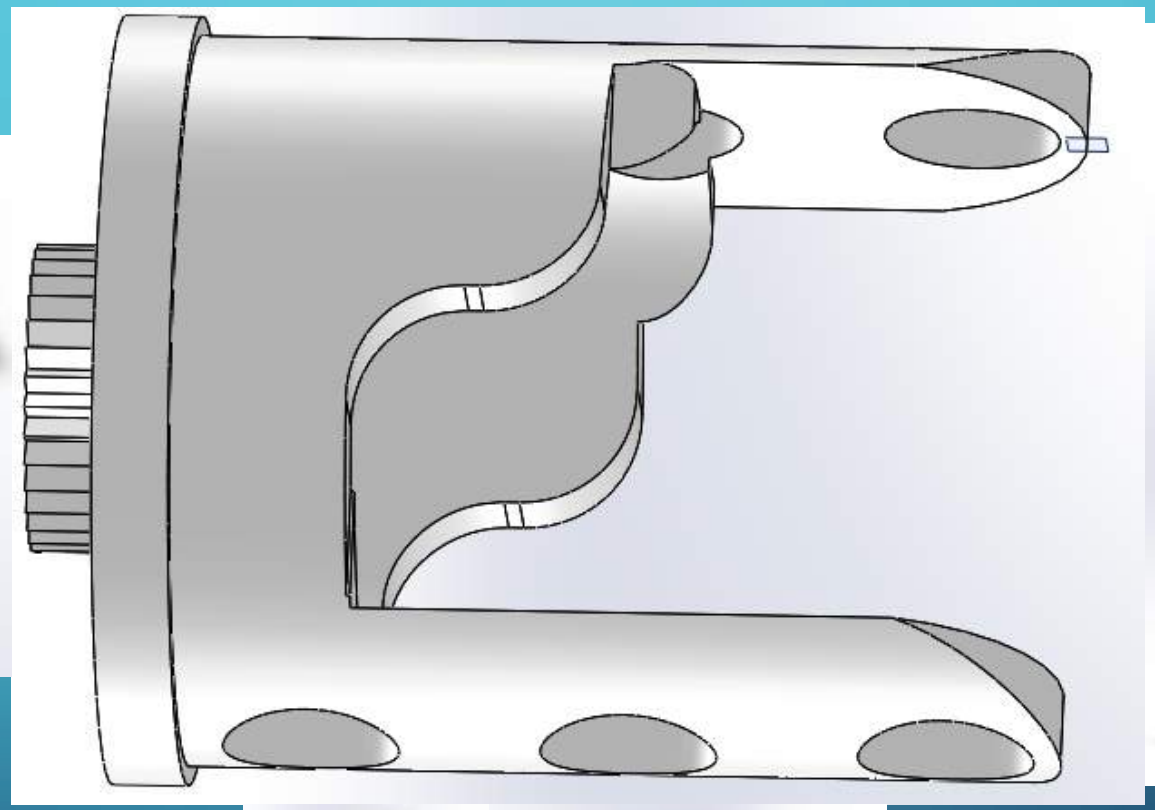


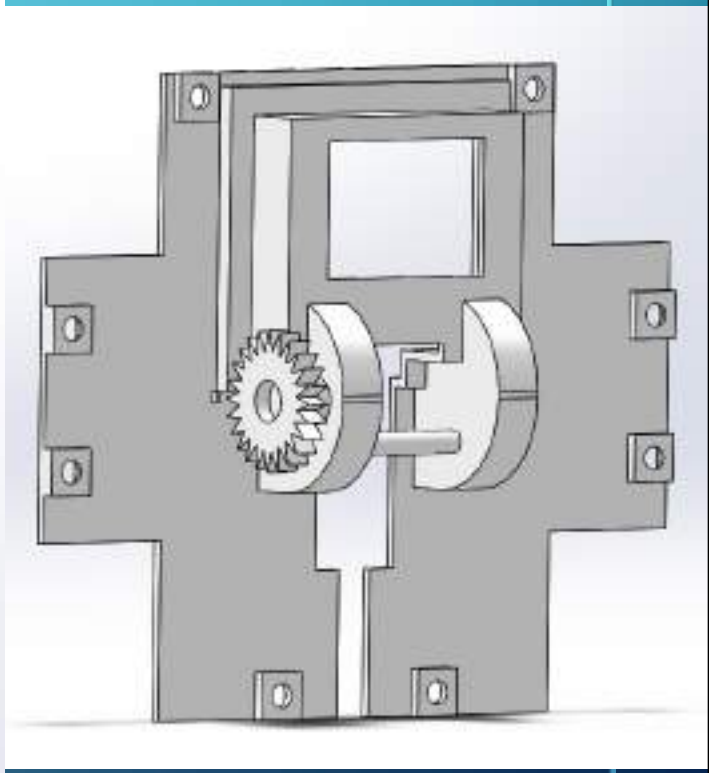


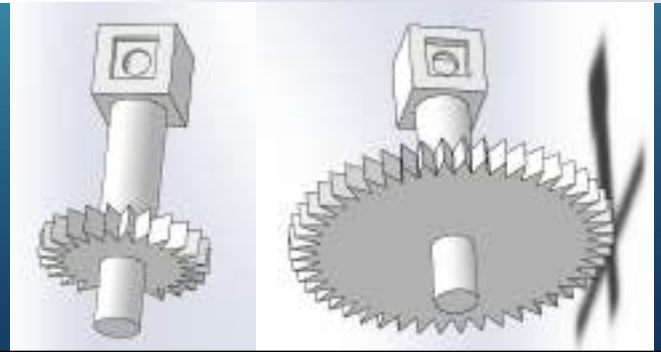


SOLUTION IN 3D WITH SOLIDWORKS

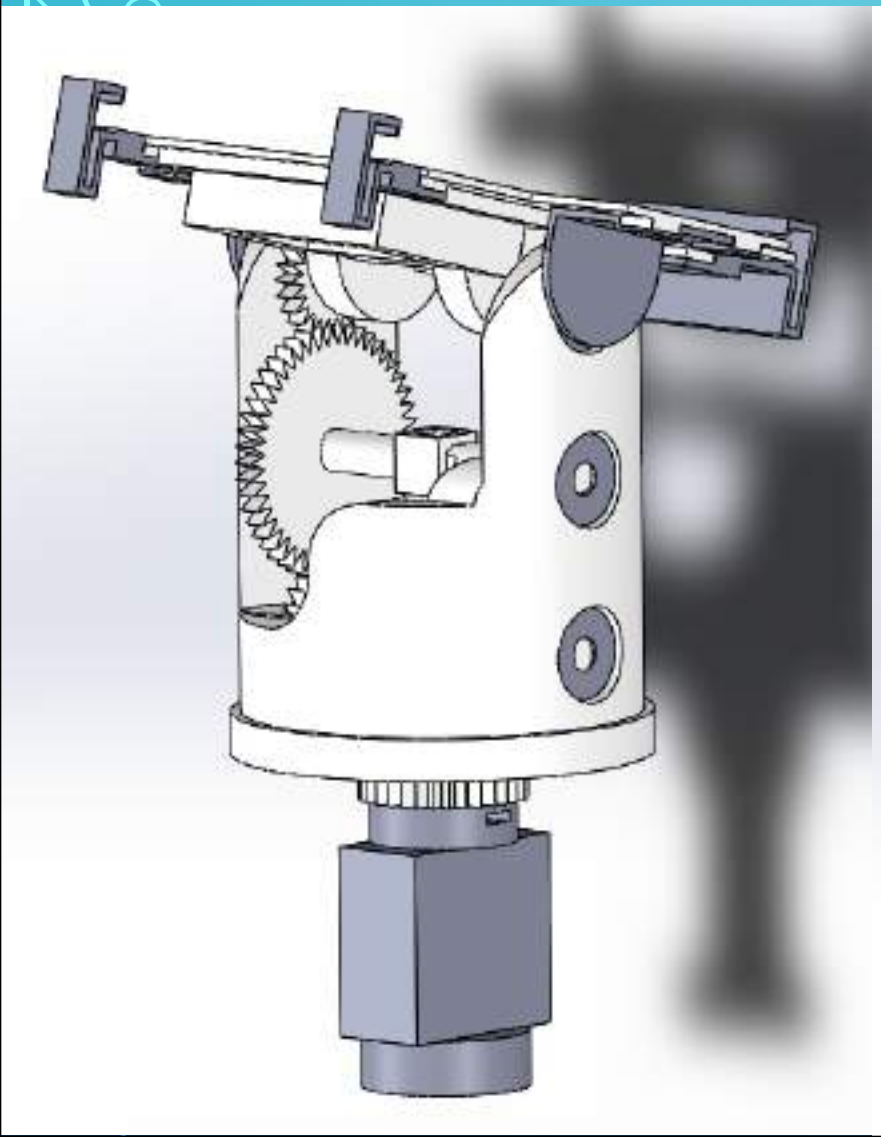


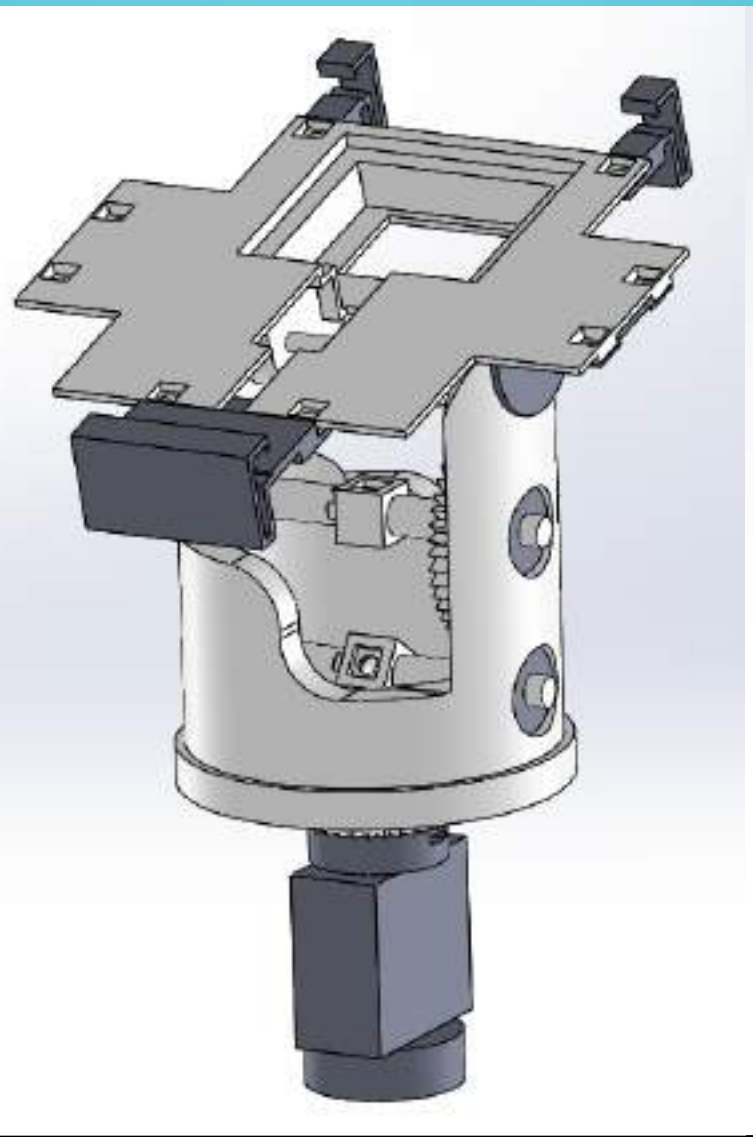


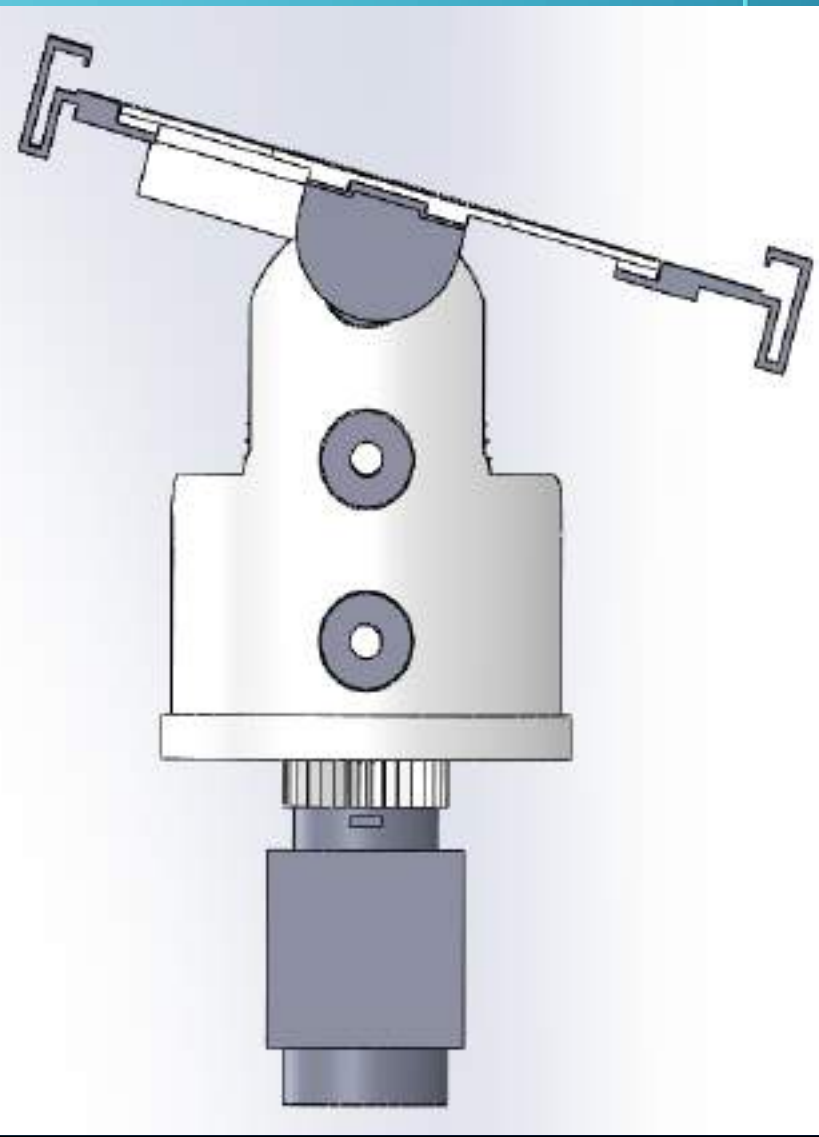




ASSEMBLY OF THE FINAL SOLUTION



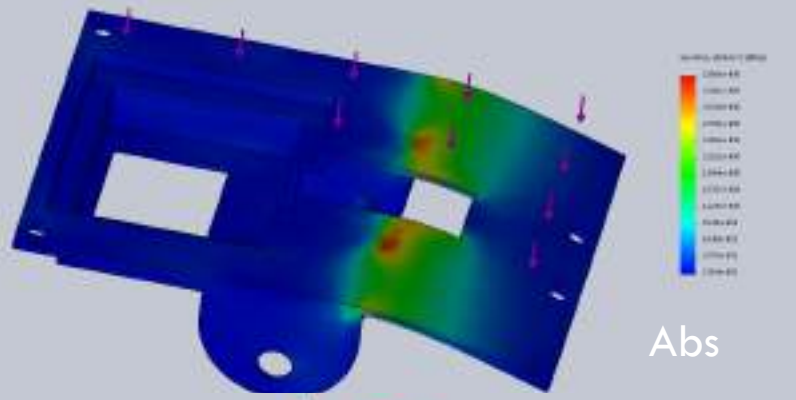




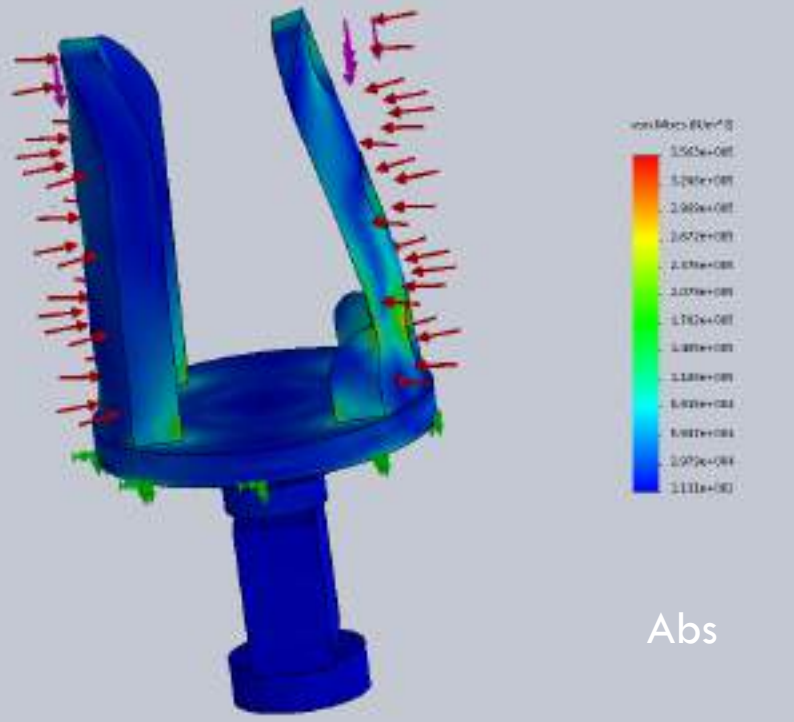
DEFINITION MATERIALS

- We have three solutions:
- **Wood** is fragile and can warp with humidity.
- **Aluminum alloy 2024 (SN)**High resistance, used a lot for structures, spare parts and parts for industry.
- **ABS Plastic** used for 3D printing, such as PLA Plastic.

DEFORMATION SIMULATION



Abs



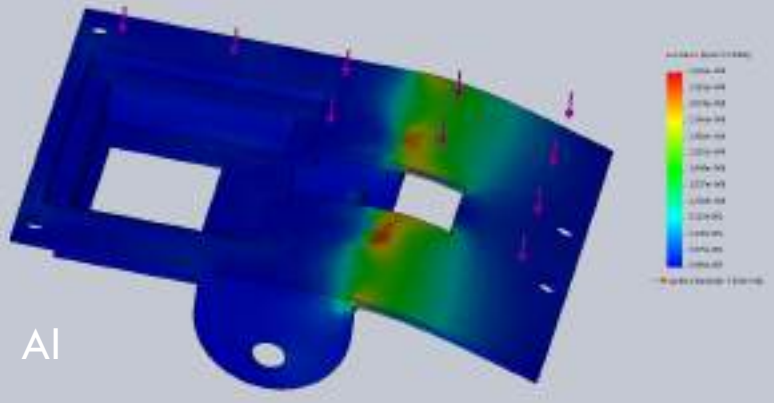
Abs

FORCE OF 9.6 N which corresponds to the weight of the solar panel.
PRESSURE OF 497 Pa which corresponds to the wind speed of 100 km / h.

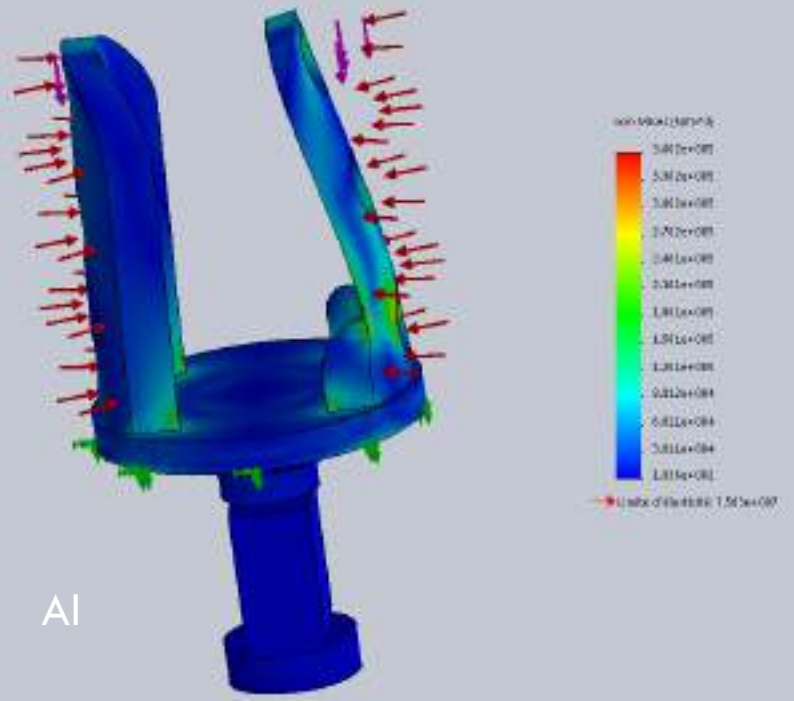
Panel Fixing

Elasticity Limit :
ABS = 2000 Mpa
Alliage 2024 = 73000 Mpa

Platform with arms
In total :
Abs : 450g max
Al : 1kg max



Al



Al

QUESTIONS ?

WARNING ! SPOILERS !

HERE IS THE PROTOTYPE FOR THE MOMENT !