Project Report

Balanced scorpion

Subject

Integrated Project II

Authors

Isaac Acevedo, Aïda Calero and Hortense Utuje

Date

07/02/2023

Background

Our project is divided in two parts, the fisrt is a balancing plate, chosen by the multitude of interesting control applications such as balance for people with diseases related to loss of stability like parkinsons's disease, athritis etc... This type of control could also be applied to help the waiters or any job that requires transporting things from on place to another and demand a certain balance. Finally, the realization of this part of the project could serve as toys for children, either for fun or learning.

On the other hand we have the mobile base where the previous project would be mounted. We do this part to consolidate our knowledge about the movement of robots, something useful in our career and implemented in many companies.

Roles

Isaac Acevedo : Mechanics

Aïda Calero: Electronics

Hortense Utuje : Programming

Although the roles have been established, at the end each one will touch all the topics to increase the knowledge ot each area.

Objectives

The main objective is to create a balancing plate using different mechanical, electrical and programming components. The definition of done for this project will be satistfied when the product can keep an object (a ball) on a plate from falling. The ball will be moved in different directions to test this capability.

As a second main objective we want to create a mobile base where it can support the balancing plate.

Specific Objectives

In order to fullfill the required steps to achieve our goal, the following are the specific objectives that need to be implemented.

Software

- Ability to adjust the plate
- Ability to calculate the correction angle
- Ability to capture the object's position in realtime
- Communication among components
- Activation of scorpio legs with joystick

Electrical

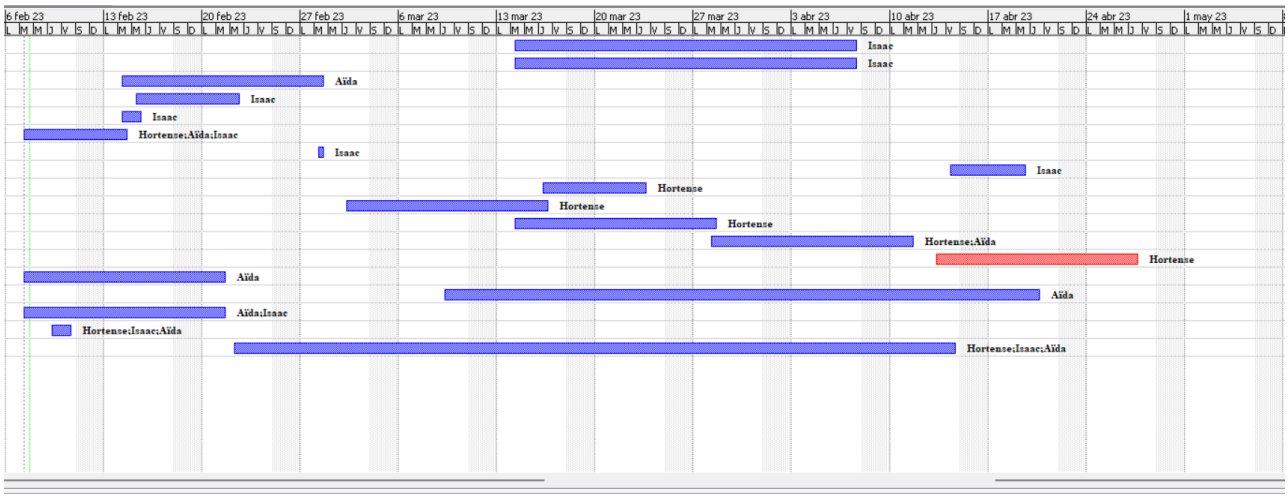
- Have electrical schematics
- Ability to power the components of the project (motors, camera, microprocessor)
- Managment of the motors

Mechanical

- Assembly of the plate legs
- 3D design of components
    - Plate
    - Scorpio legs
    - Plate legs
- Assembly of the scorpio legs

Tasks

		Nombre	Nombres del Recurso
1		3D design scorpion base	Isaac
2		3D design scorpion legs	Isaac
3		3D design scorpion tail	Aïda
4		3D design plate saport	Isaac
5		3D design plate base	Isaac
6		Research components	Hortense;Aïda;Isaac
7		Assembly of the plate legs	Isaac
8		Assembly of the scorpio legs	Isaac
9		Ability to adjust the plate	Hortense
10		Ability to calculate the correction angle	Hortense
11		Ability to capture the object's position in realtime	Hortense
12		Communication among components	Hortense;Aïda
13		Activation of scorpio legs with joystick	Hortense
14		Have electrical schematics	Aïda
15		Ability to power the components of the project (motors, camera, microproces...	Aïda
16		Managment of the motors	Aïda;Isaac
17		PowerPoint presentation	Hortense;Isaac;Aïda
18		Print 3D design	Hortense;Isaac;Aïda



Bibliography

- https://github.com/nicohmje/PID-ballonplate
- https://www.researchgate.net/publication/363153766_Ball_Balancing_PID_System_using_Image_Processing
- https://github.com/giusenso/Ball-Balancing-PID-System