Presentation client

Swarm Shooters

05/10/2022

Introduction

Original idea / Subject of the project designed by us

Designed for defense and attack purposes again st drones

Team Members

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Context

Design solution

Diagram of the robot (HW, SW)

Presentation of the test code

Design Solution

Anti-drone

Bronze Test :

- The robot is able to scan the sky and detect the target
- The robot is able to evaluate the distance to the target

Silver Test:

- The robot is able to shoot an object in the general direction of the target (not taking into account altitude)
- It is able to detetct multiple targets (multiple posibilites)

Golden Test:

- The robot is able to discriminate and prioritize targets
- The robot is able to shoot the target taking into account its altitude/elevation

Robot Swarm

Bronze Test :

- Create at least 2 autonomous moving robots, measure the color of the ground and share the information wirelessly
- Robots starting point is known
- Research area is known
- Robots have to split the work and cover all the given area.
- Robot path can be hard coded

Silver Test:

- Create a third robot
- Handle the case a robot lost its connection to the network
- Handle the case a robot breaks down

Golden Test:

- Present the information collected by the 3 robots to the end us er in a graphical way

Swarm Shooters

Contract : Shooting at drones with 2 robots communicating with each other (combination of th e two other projects)

Bronze Test :

- Create 2 robots : 1 static master robot and 1 moving slave robot t hat share information
- Moving robot starting point is known
- Moving robot is able to scan the sky and detect the target
- Moving robot is able to evaluate the distance to target

Silver Test:

- Moving robot is able to shoot an object in the general direction of the target by master's instructions
- Handle the case a robot lost its connection to the network
- Handle the case a robot breaks

Golden Test:

- Master robot is able to discriminate and prioritize targets
- Moving robot is able to detect multiple targets
- Moving robot is able to shoot the target taking into account its altitude/elevation by master

Solutions

Bronze Test :

- Pixy Camera used to detect the target and evaluate the distance between robot and target
- We intend to connect the master and slave robot through Wifi
- Starting point of moving robot can be determined with a non-trivial Python function that will be implemented
- Gear wheel to perform elevation and idler wheel to rotate

Silver Test:

- Springs and locks for shooting with a motor

Golden Test:

- Solution include only software modifications (adding one function for multiple targets and prioritization)

Design :

- 2 Lego Mindstorm Brick
- 2 wheels, 3 motors and 1 idler wheel
- 1 pixy camera
- 1 dongle WIFI
- Gear wheel

- 2 locks and springs
- 1 motor

Test Scenario

Bronze Test :

- Create a target for the detection
- Establish connection between the master and slave (the slave detect, evaluate the distance and share the information to the master)
- When the master receive it, it shows a message on brick's screen

Silver Test:

- Same steps as bronze test.
- Slave robot will shoot at the target's direction when it receive the master robot's response

Golden Test:

- Same steps as silver test
- However, they will be multiples targets and slave robot will shoot the closest one

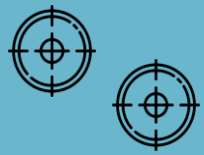


Diagram of the robot (Hardware & Software)

Hardware (Slave robot)

Wifi dongle for connection with master

Motor + wheel

LEGO Brick

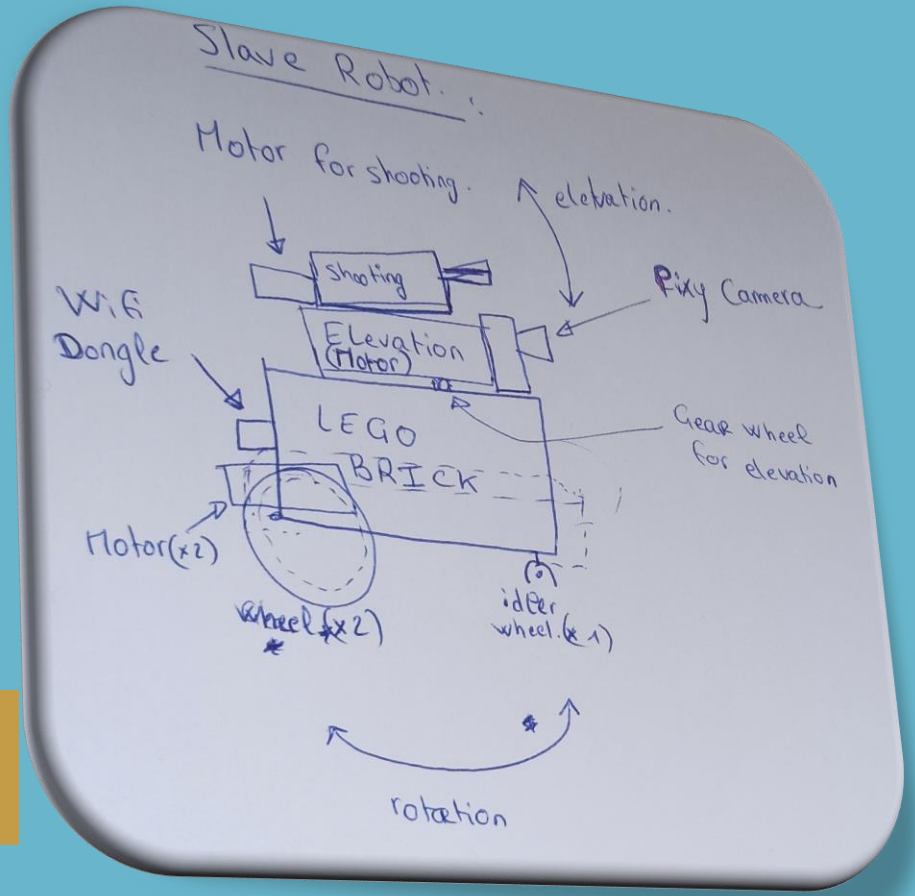
Idler wheel

Motor + wheel

2 locks and springs for the missile

Motor for camera and shooting elevation
+ Gear wheel (for camera)

Sensors :
- pixy camera



Hardware (Master robot)

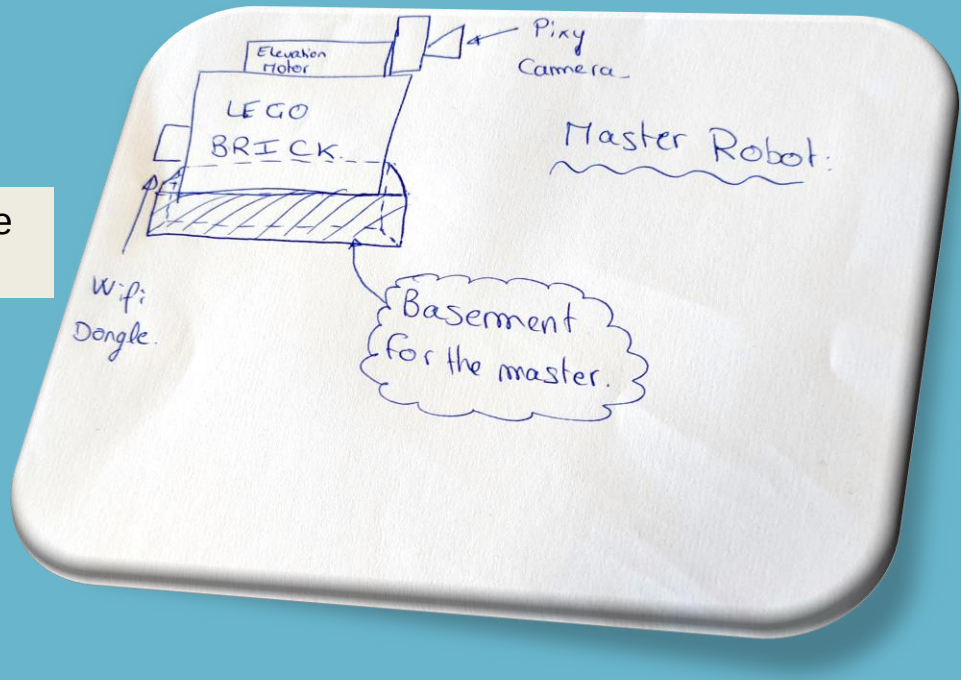
Wifi dongle for connection with master

LEGO Brick

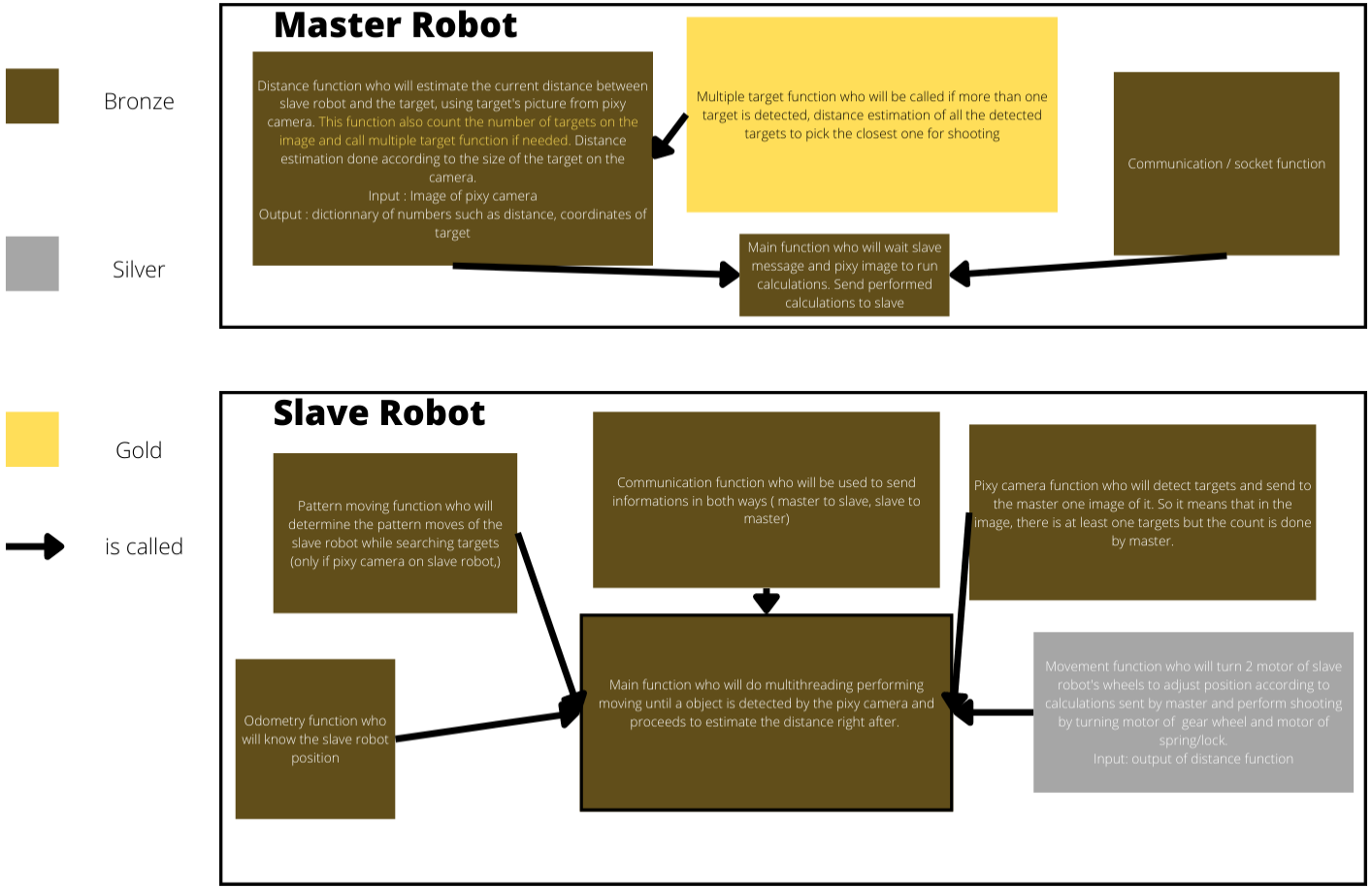
Basement for the Master robot

Motor for camera elevation

Sensors :
- pixy camera



Software Diagram (Bronze, Silver, Gold)



Presentation of test code

Thanks!