

UVIC

UNIVERSITAT DE VIC
UNIVERSITAT CENTRAL
DE CATALUNYA

INTEGRATED PROJECT II

Bachelor Degree in Mechatronics

FOLLOW-ME ROBOT

FINAL
PRESENTATION

FOLLOW-ME ROBOT

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FOLLOW-ME ROBOT

OBJECTIVES

Main Objective

1. Create a follow-me robot in order to increasing efficiency and productivity.

Specific Objectives

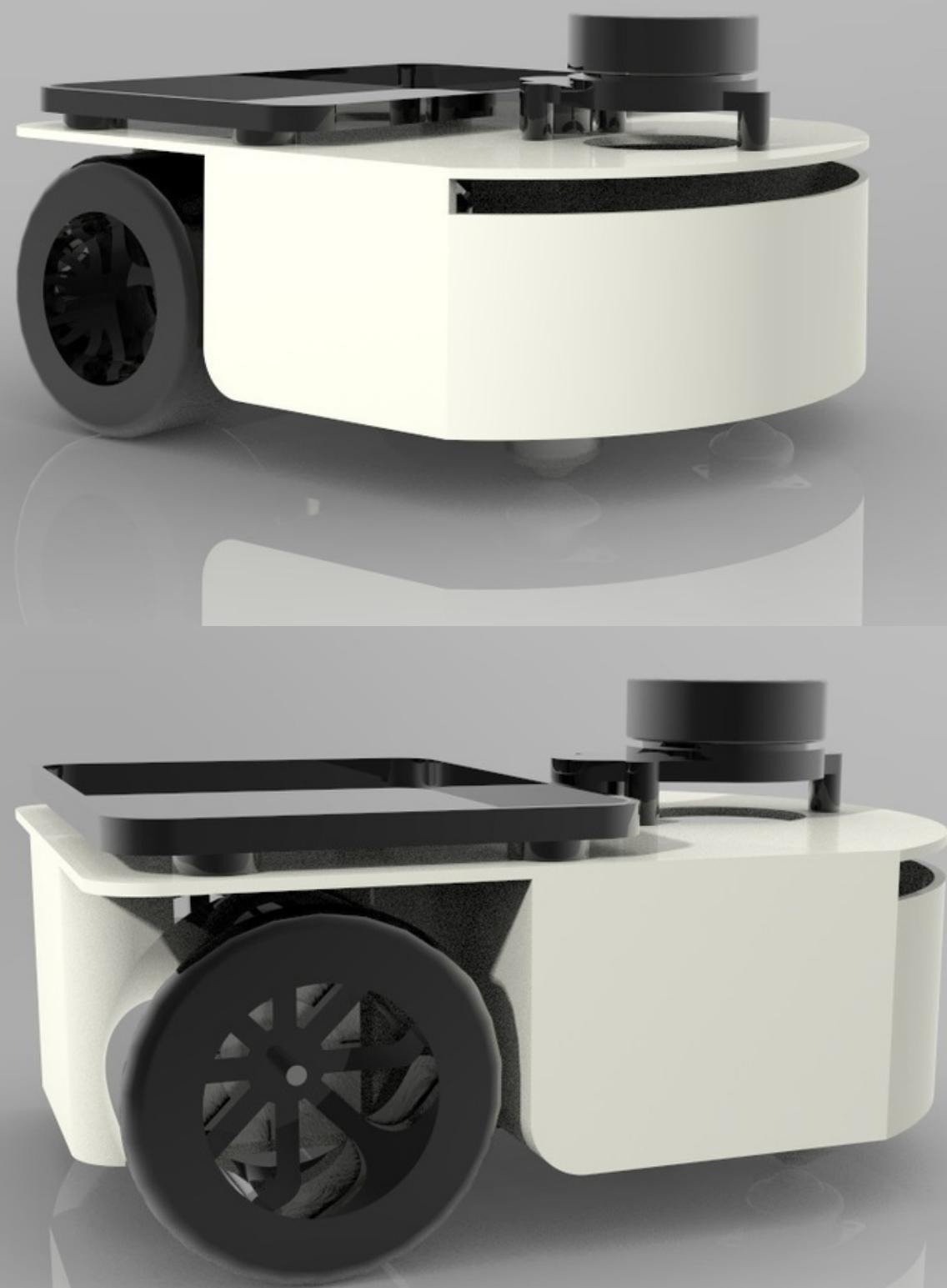
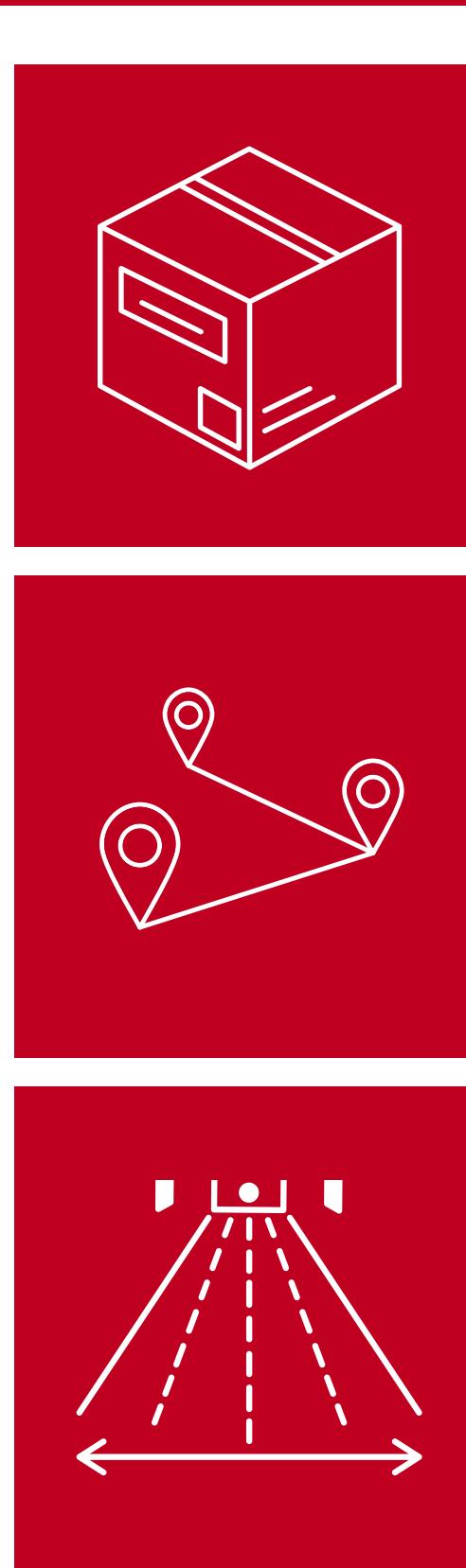
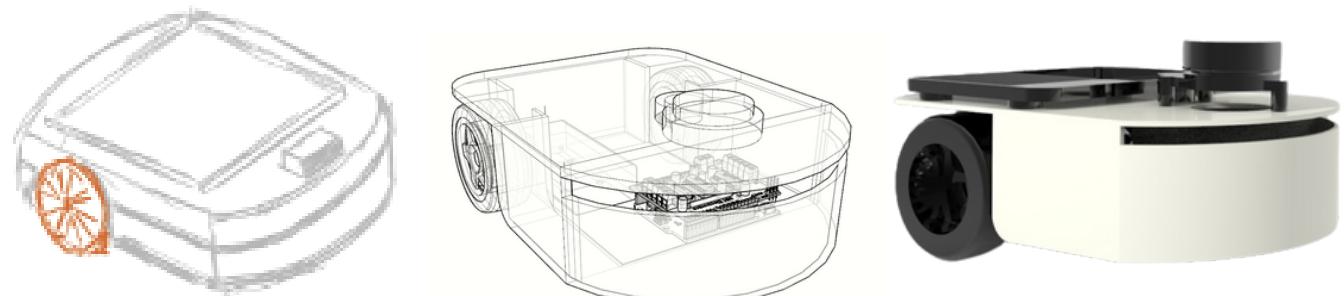
1. Design a robot that can follow a person autonomously.
2. Integrate sensors to allow the robot to detect and follow a person.
3. Develop a control system to allow the robot to follow a person smoothly and smoothly.
4. Add additional functionality to the robot, such as the ability to carry objects.
5. Wireless robot using a battery.

FOLLOW-ME ROBOT

DESIGN

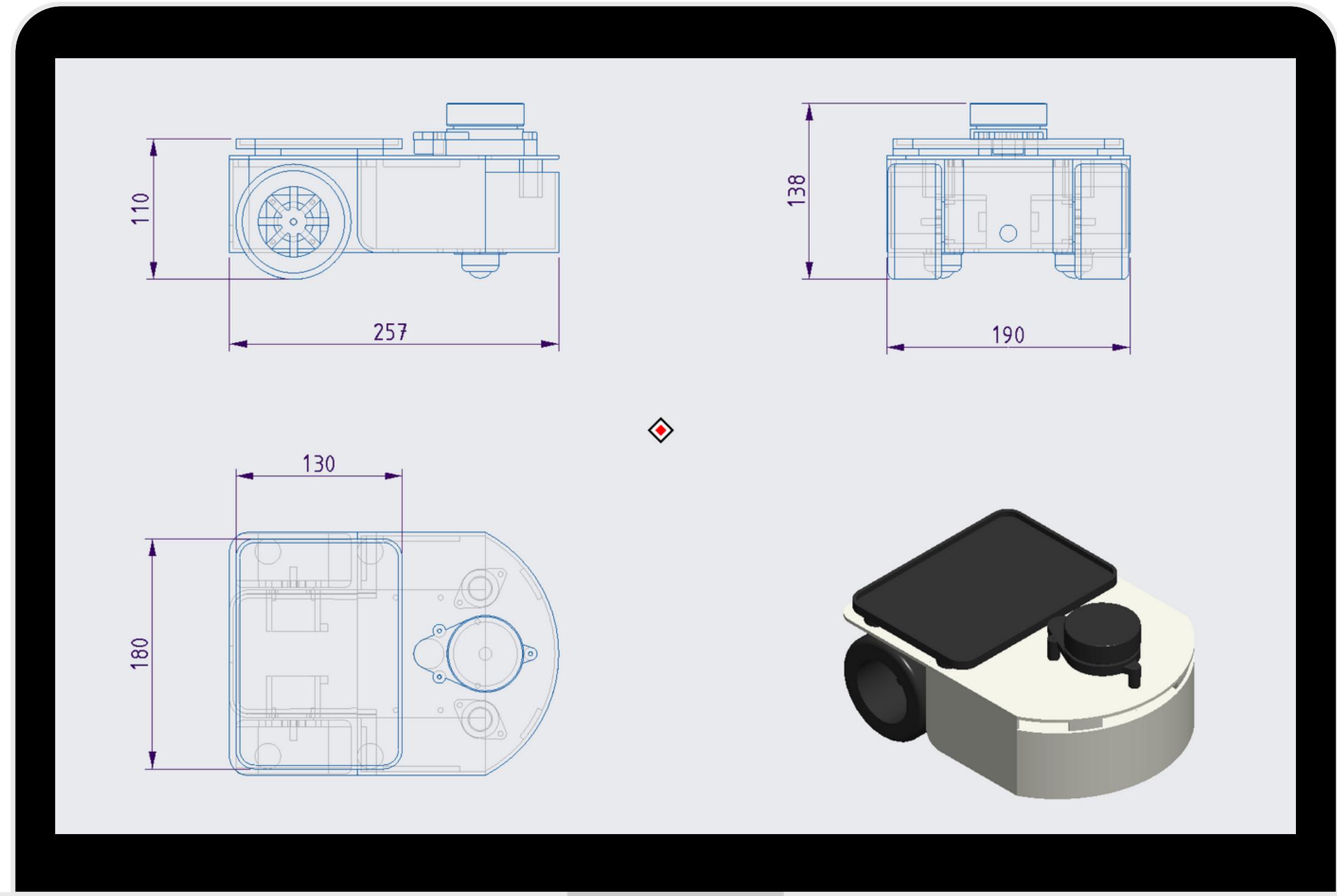
A robot that follows a person and carries boxes.

- Sketchup
- PTC Creo
- 3D printer



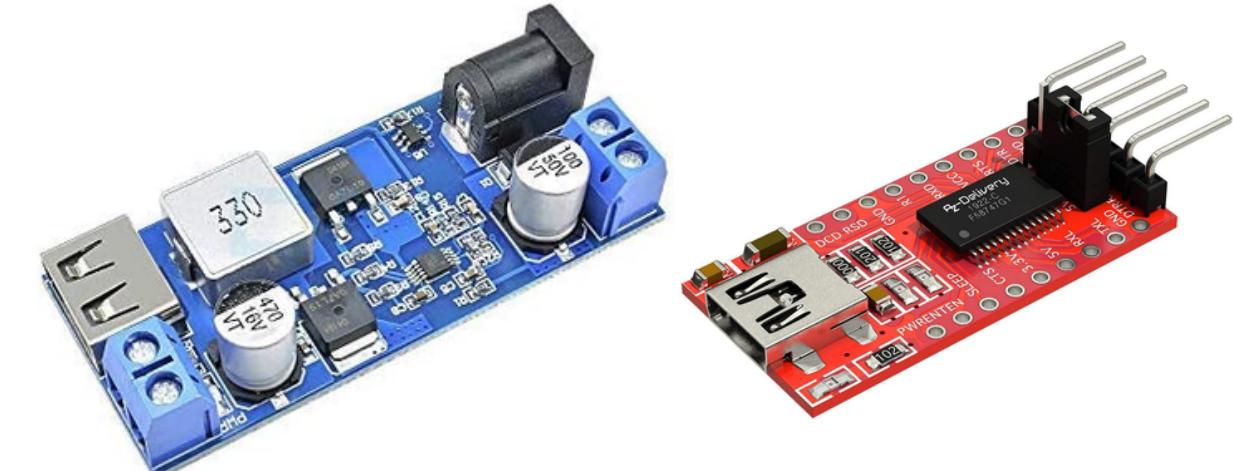
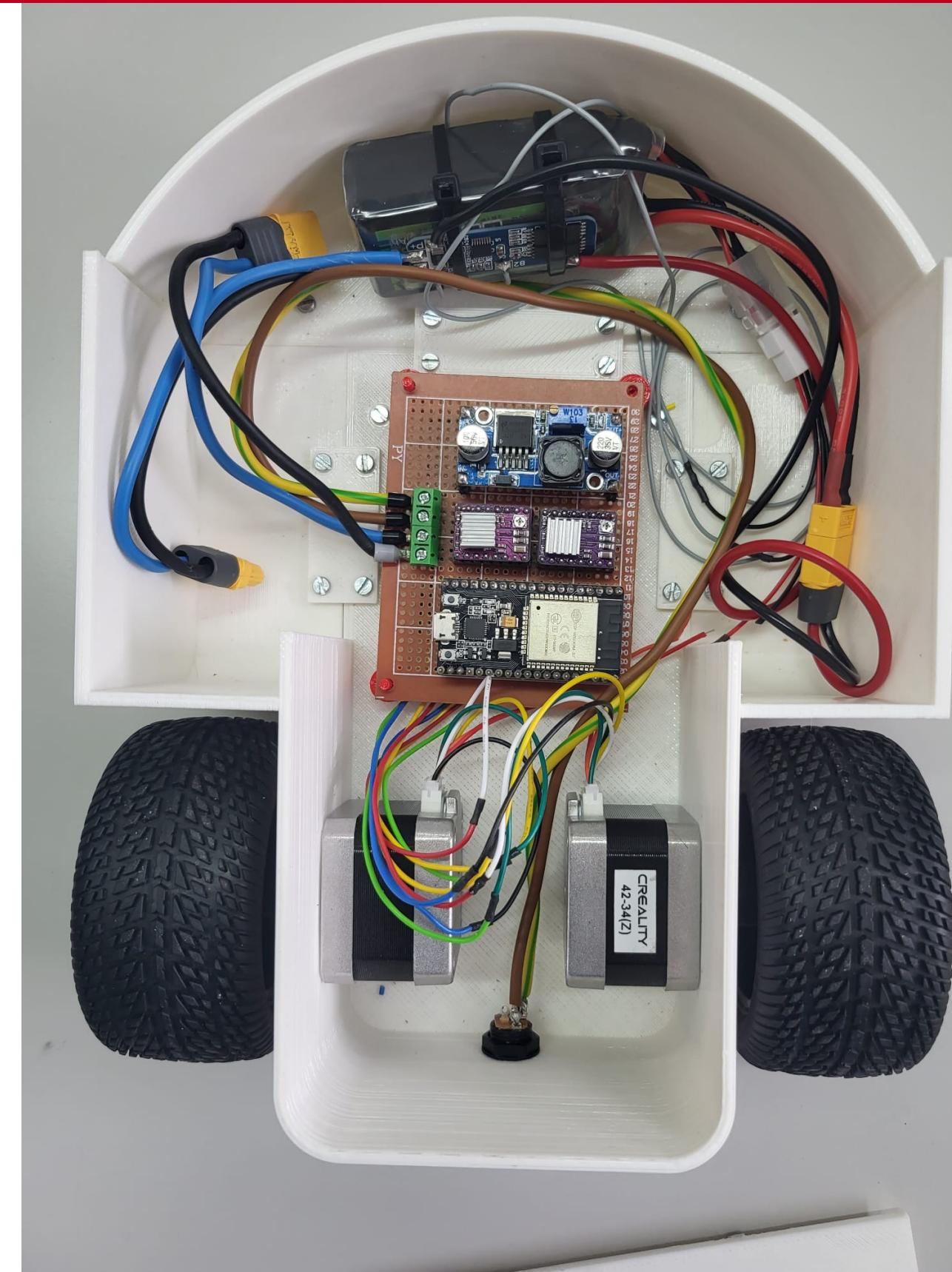
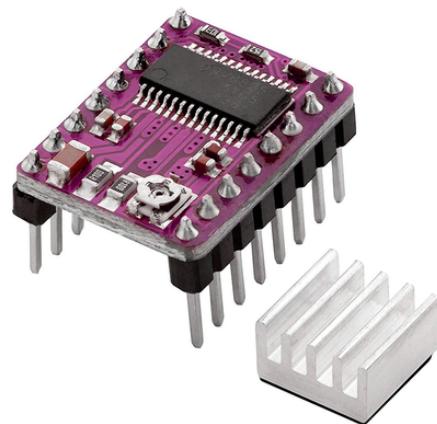
FOLLOW-ME ROBOT

DESIGN



FOLLOW-ME ROBOT

COMPONENTS



FOLLOW-ME ROBOT

C A L C U L A T I O N S

Weight supported by the robot: 4 kg

Force on each wheel: 3 N

Radius of the wheel: 35mm

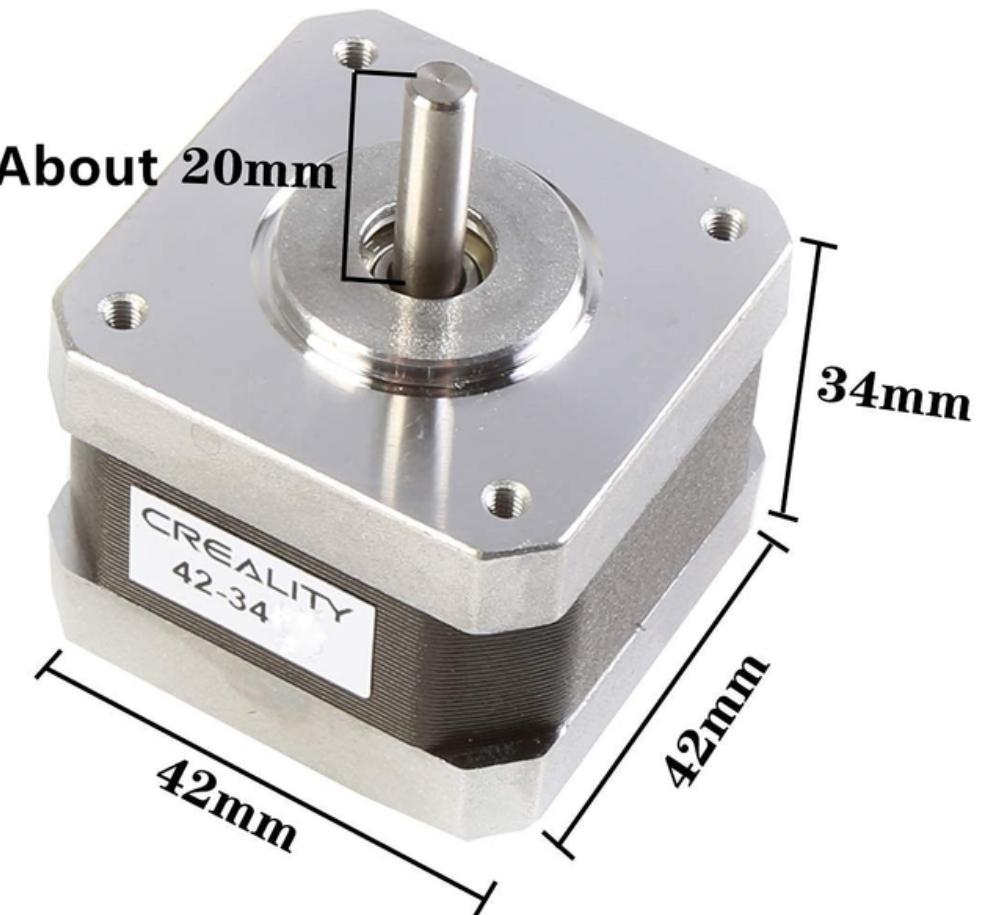
Torque needed for each wheel: 0.104Nm

Power needed for each wheel: 1.5W

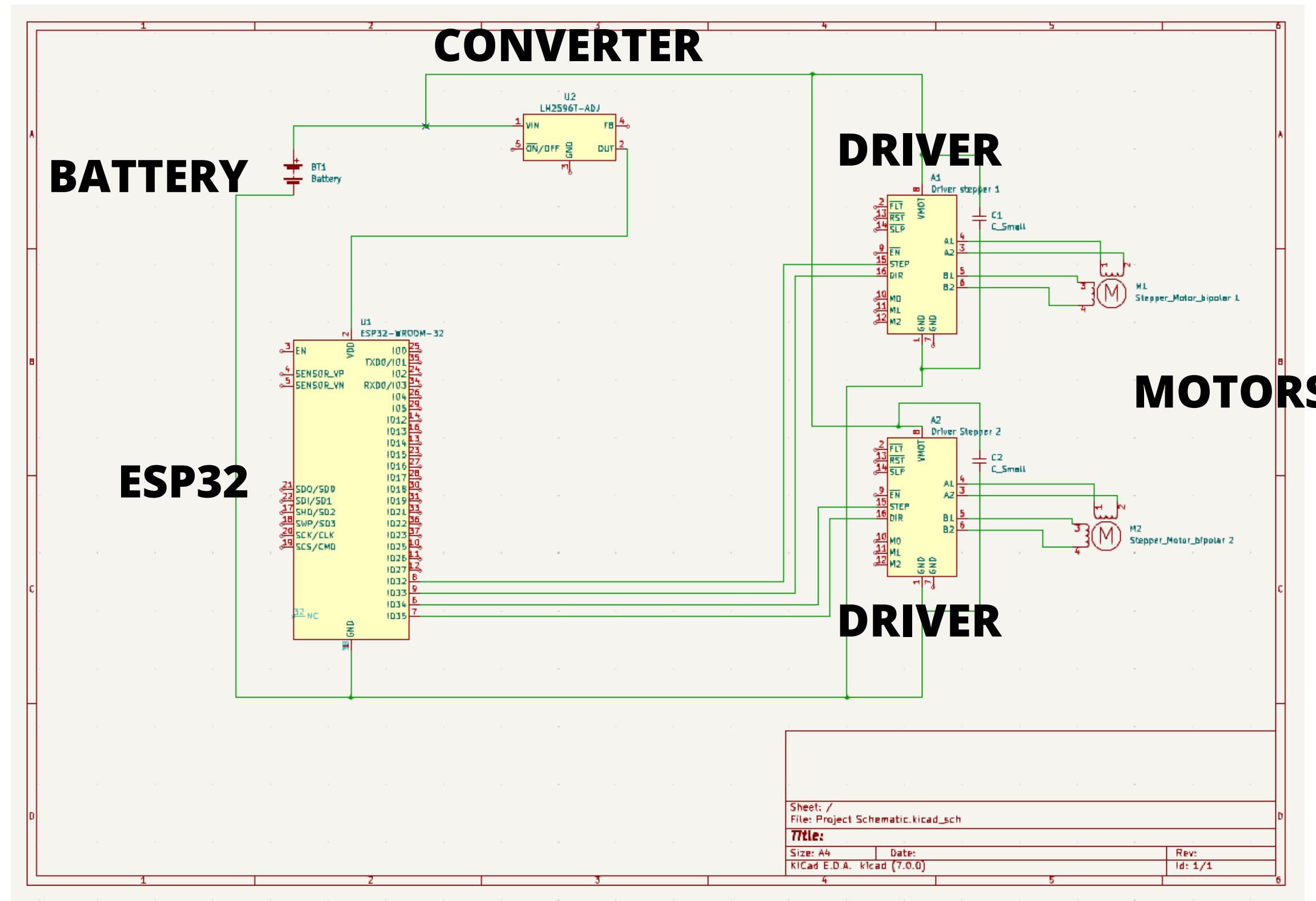
$$F_r = W/4 \cdot u \quad T = F \cdot R$$

$$P = T \cdot \omega$$

Motor min specifications : 0.210Nm 3W

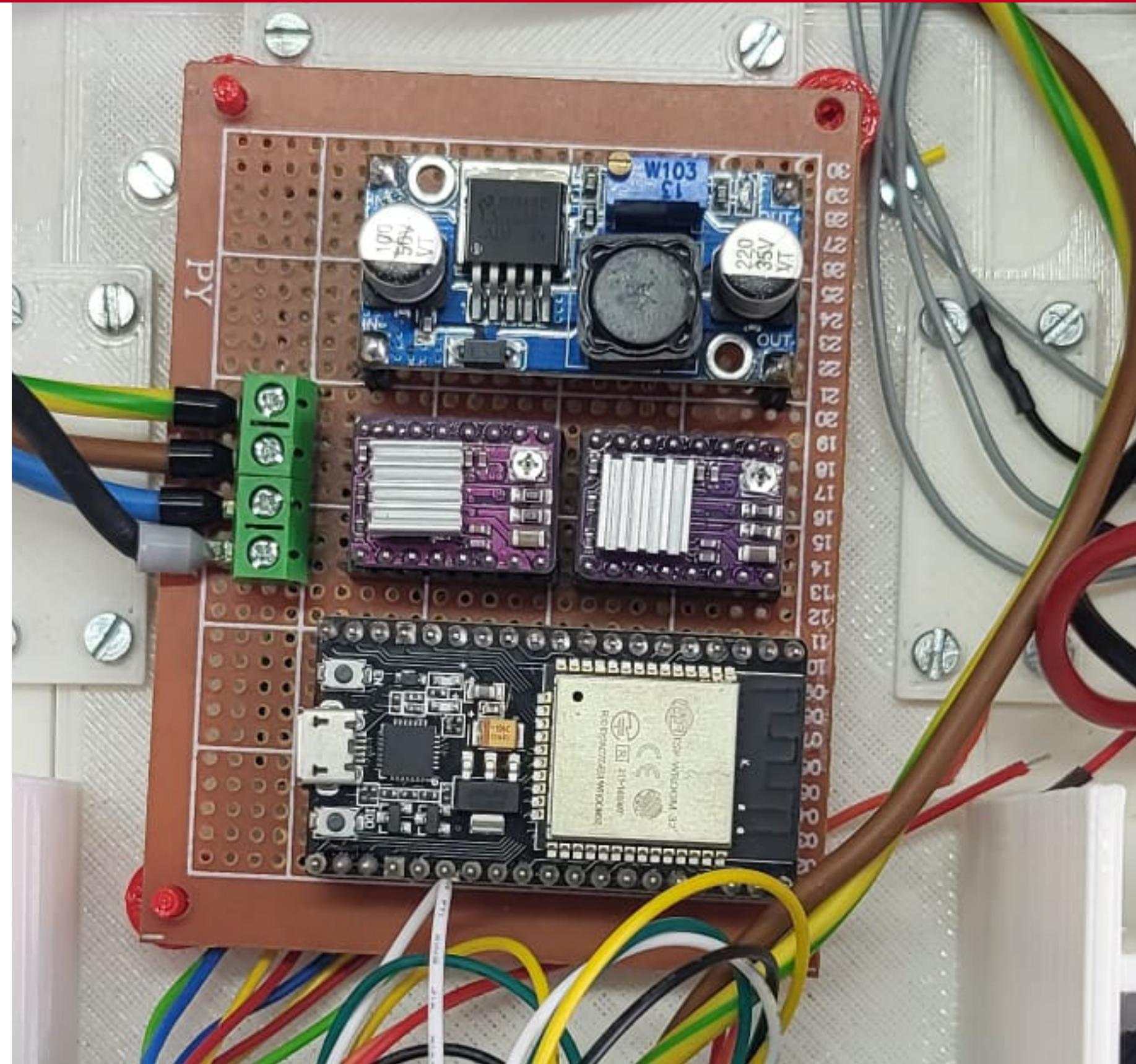


ELECTRONIC SCHEMATIC



ELECTRONIC SCHEMATIC

BATTERY



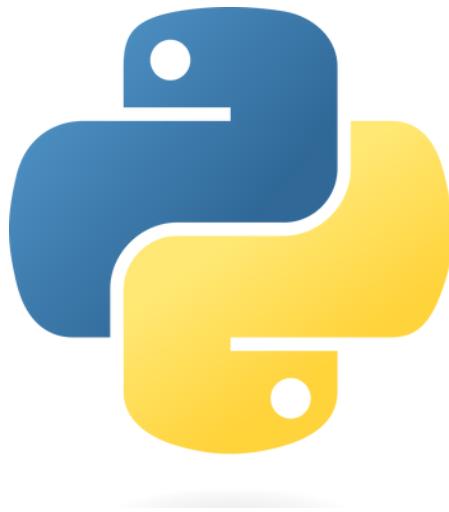
BUCK CONVERTER

DRIVERS

ESP32

FOLLOW-ME ROBOT

SOFTWARE



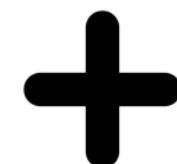
Python

Decode LiDAR byte message

Display on the screen what the sensor sees

Arduino

Act accordingly on the motors



First idea:

Only arduino for everything, decode the LiDAR message and act on the motors (C++)

Improvement

Use the potential of python libraries and communicate via serial port with esp32



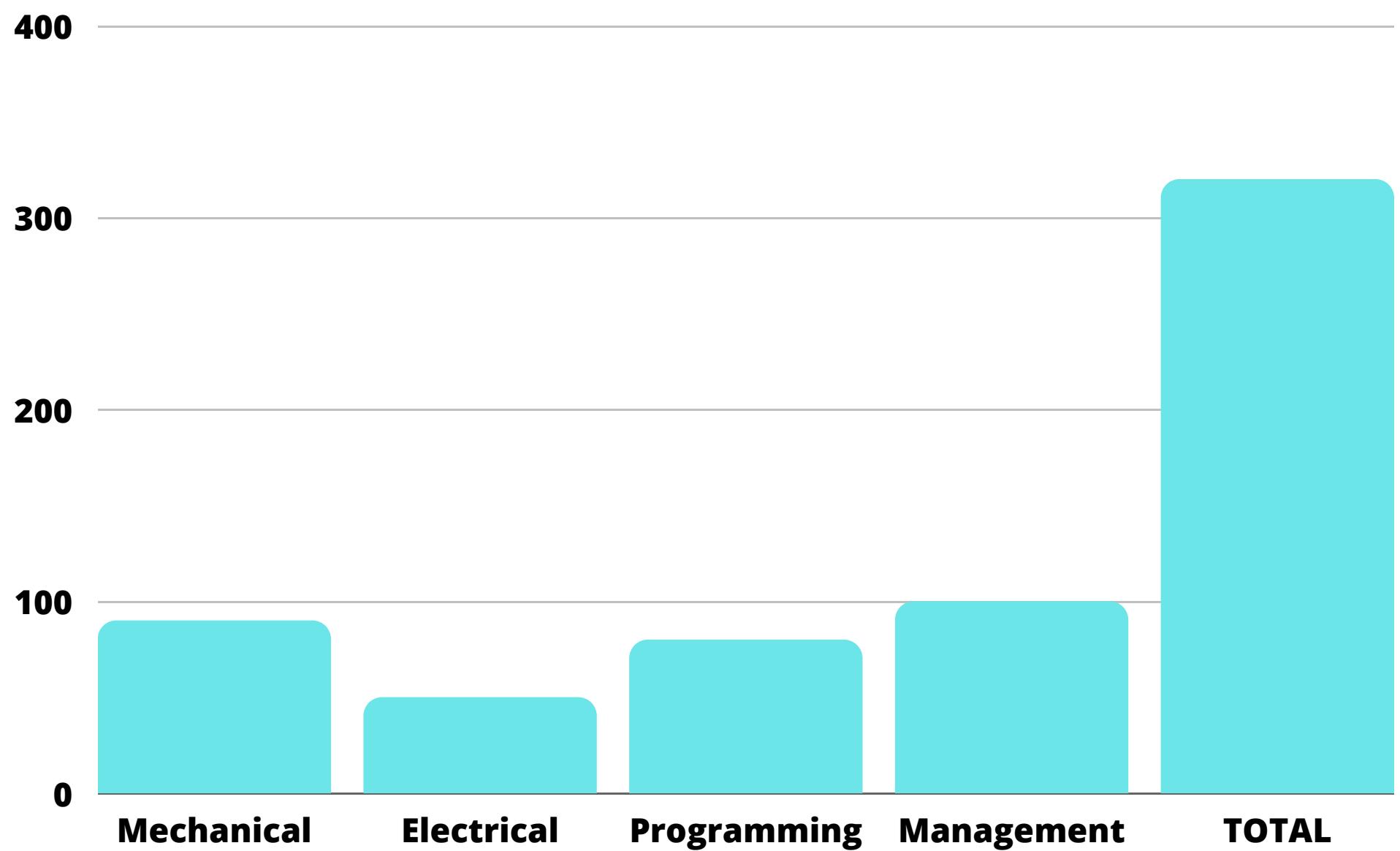
FOLLOW-ME ROBOT

BUDGET

SUBTOTAL: 265,38€
(mechanic/electrical components)

SUBTOTAL: 4800€
(work hours)

TOTAL AMOUNT: 5065,38€



FOLLOW-ME ROBOT

REFERENCES

<https://www.instructables.com/Follow-Me-Robot/>

GPS Robot

[https://seuelectronica.l-h.cat/detailEquipment_2.aspx?
2SWuCuPsO4Ow0LfM8n4JdfYPOjG28KoP5](https://seuelectronica.l-h.cat/detailEquipment_2.aspx?2SWuCuPsO4Ow0LfM8n4JdfYPOjG28KoP5)

Follow-me system

<https://www.instructables.com/Follow-Me-Robot-Using-Arduino-Based-Embedded-Platf/>

<https://www.pocketmagic.net/make-the-robot-follow-you/>

