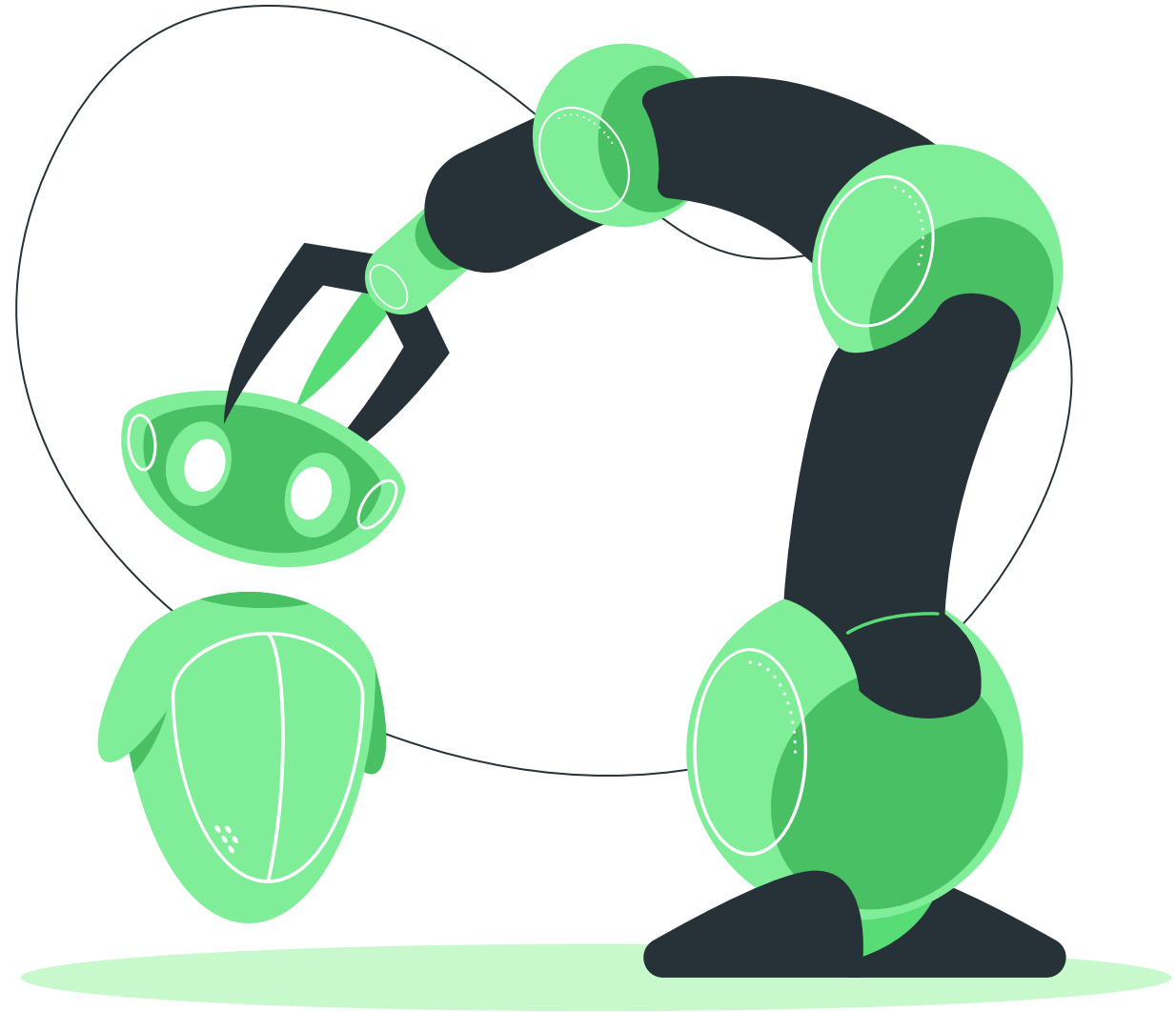


# **Mobile Robotic Arm**

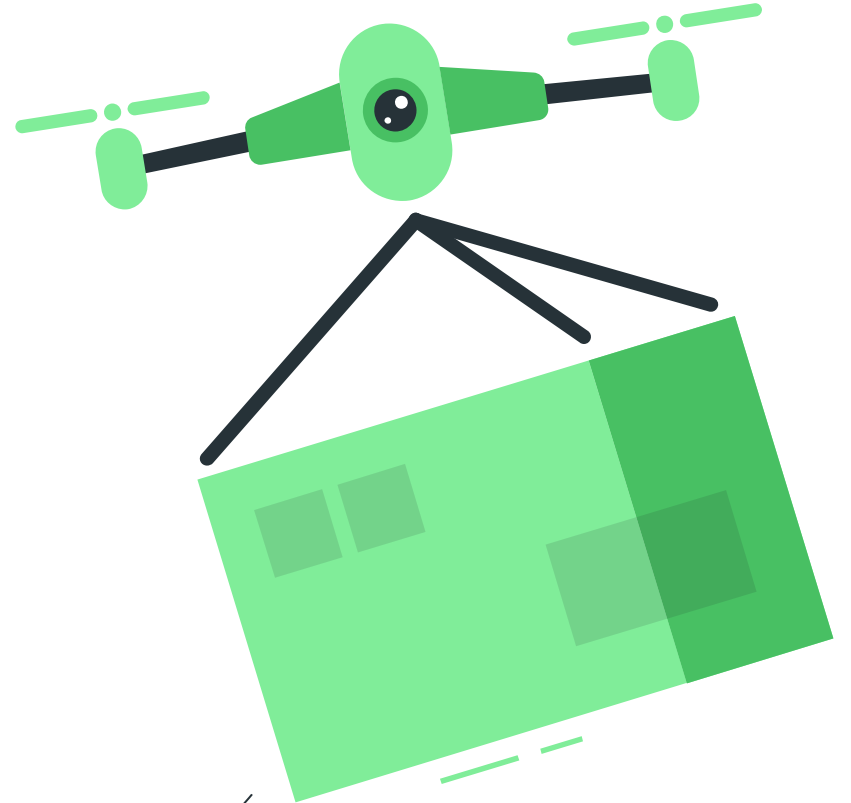
Stefan-Darian Cirnat



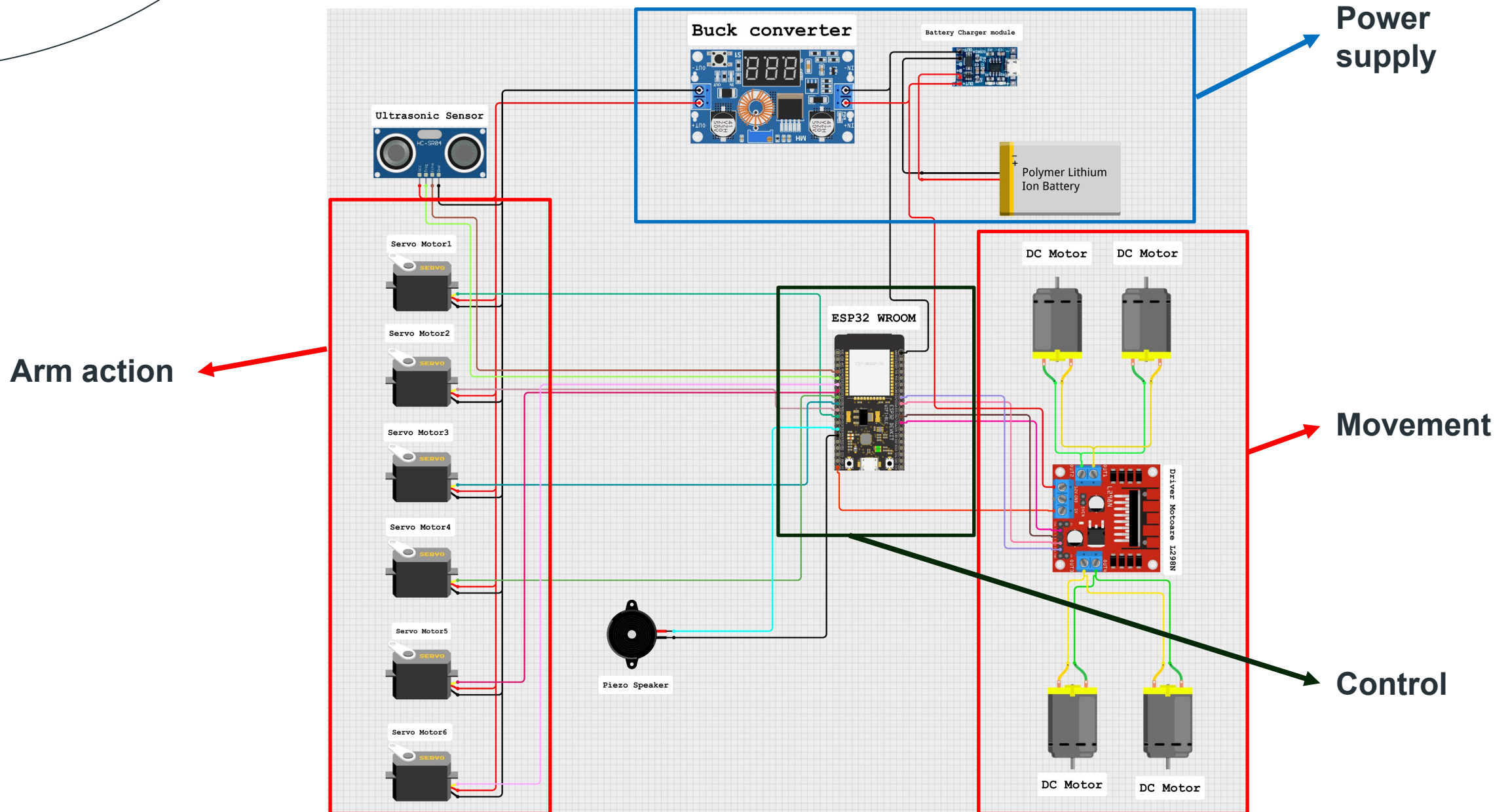
# Introduction

**Overview:** a mobile robotic arm designed to **manipulate** objects

**Control:** via **web/mobile app** using a **microcontroller**



# General schematic

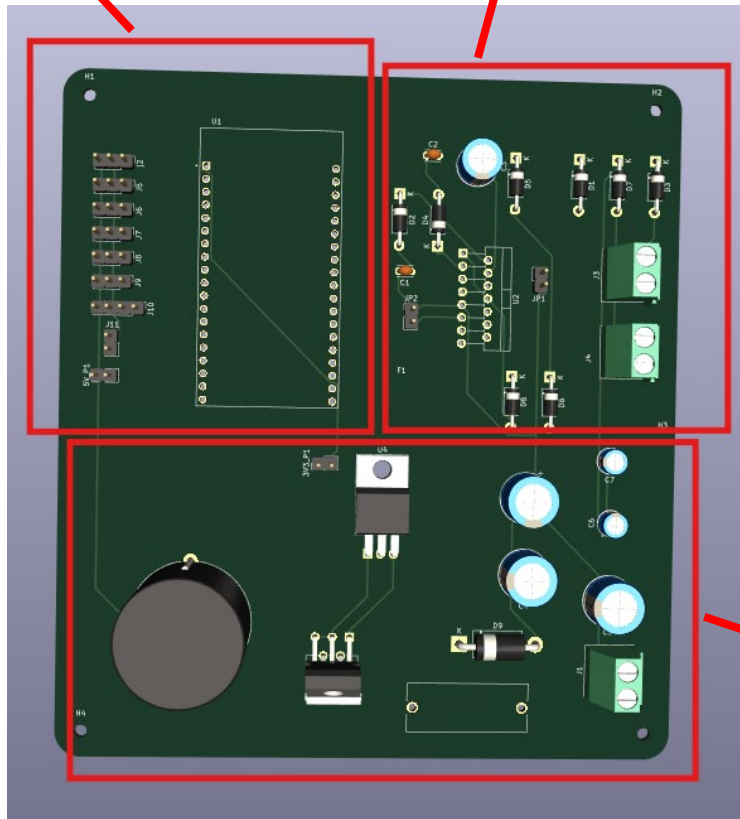


# PCB design

## 3D View

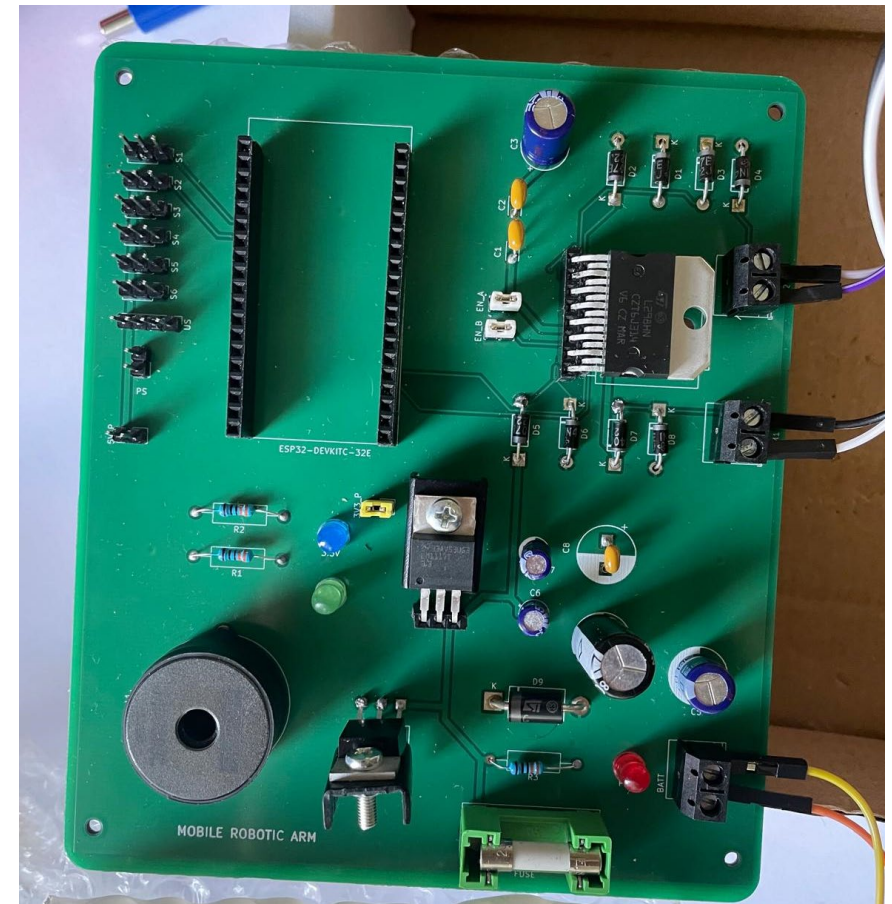
Microcontroller  
+ servo

Motor-driver



Power  
supply

## Real-life view



# Control app (GUI)

**Movement**

**distance  
measurement +  
object detection**

**Arm action**

Forward Left ↖	Forward ↑	Forward Right ↗	Servo 1 Right ←	Servo 1 Left →
Left ←		Right →	Servo 2 Left ←	Servo 2 Right →
Backward Left ↙	Backward ↓	Backward Right ↘	Servo 3 Left ←	Servo 3 Right →
Distance [cm] 40			Servo 4 Left ←	Servo 4 Right →
360 Arm Rotation — <input type="range"/> + 70			Servo 5 Left ←	Servo 5 Right →

# Key features



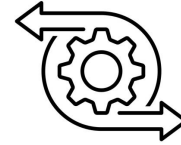
## Power stability

- ☐ Voltage regulators
- ☐ Protection systems



## Robust design

- ☐ High-quality parts
- ☐ Forced stop system
- ☐ Stability



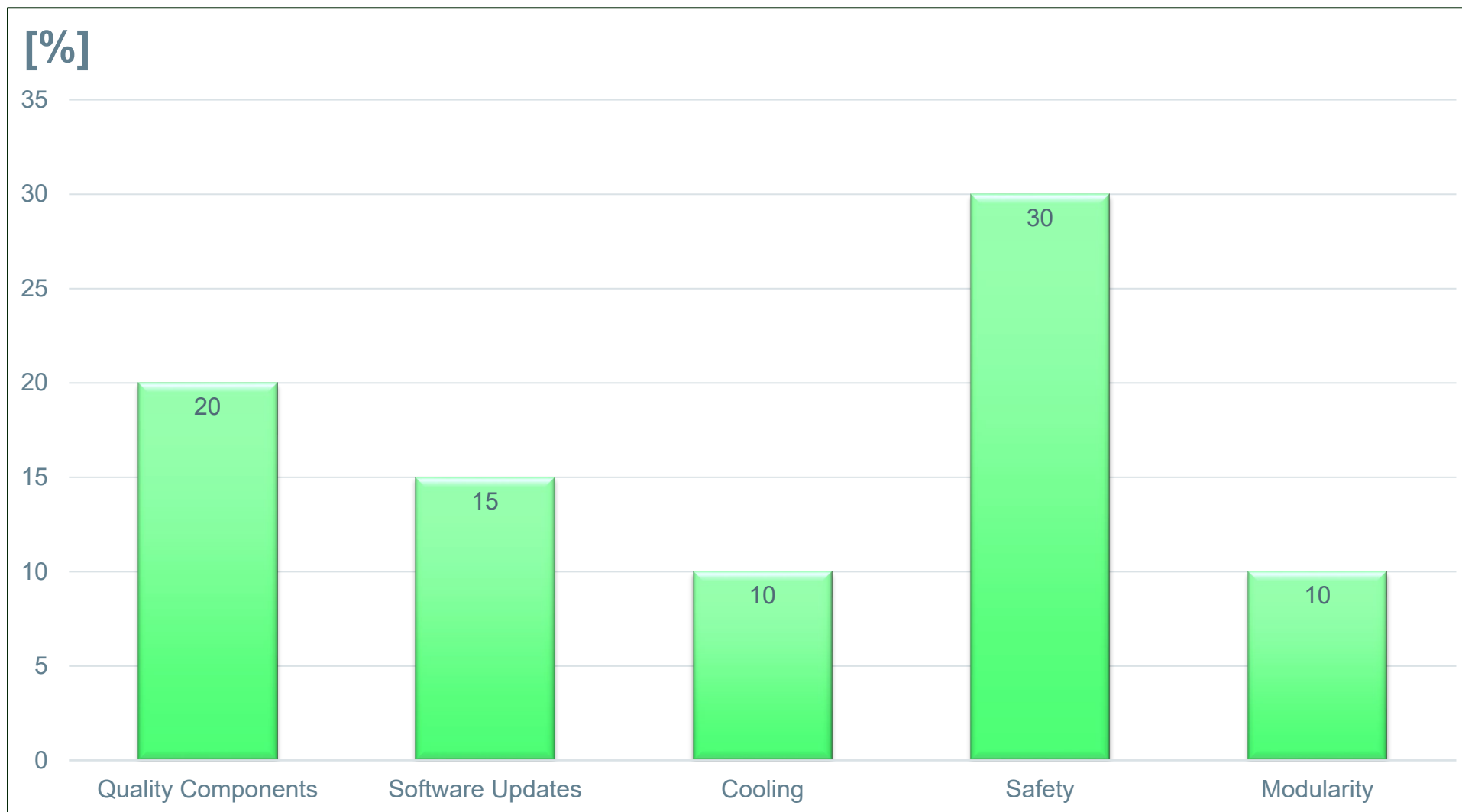
## Flexibility and precision

- ☐ Flexible arm movement
- ☐ Remote control

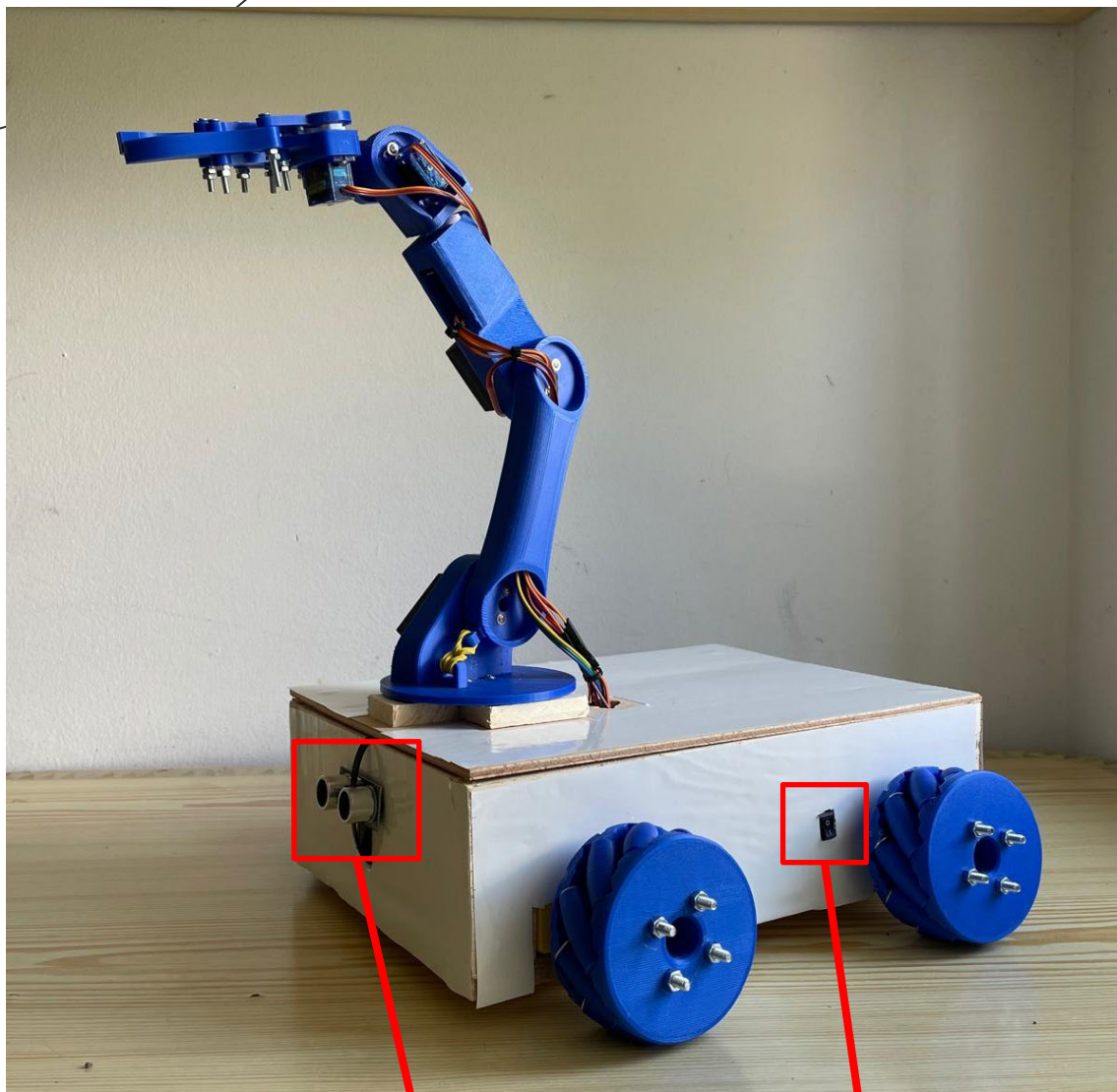
# Theory vs. reality

Aspect	Theoretical	Reality
Sensor Accuracy	Distance measured with <b>&lt;1cm error</b>	Measurement error of <b>2-3cm</b>
Servo Rotation	Smooth and precise rotation	Sometimes <b>irregular</b> movements
Wi-Fi Connectivity	Stable and continuous	<b>Intermittent</b> connectivity
Command Response	<b>Instantant</b> response	1-2 seconds delay in response
Battery Life	<b>4 hours</b> of continuous operation	<b>~3.5 hours</b> of continuous operation
Motor Control	<b>Precise and controllable</b> movements	<b>Skidding and inaccurate</b> movements
System Stability	No unexpected reboots	Occasional reboots

# Improvements

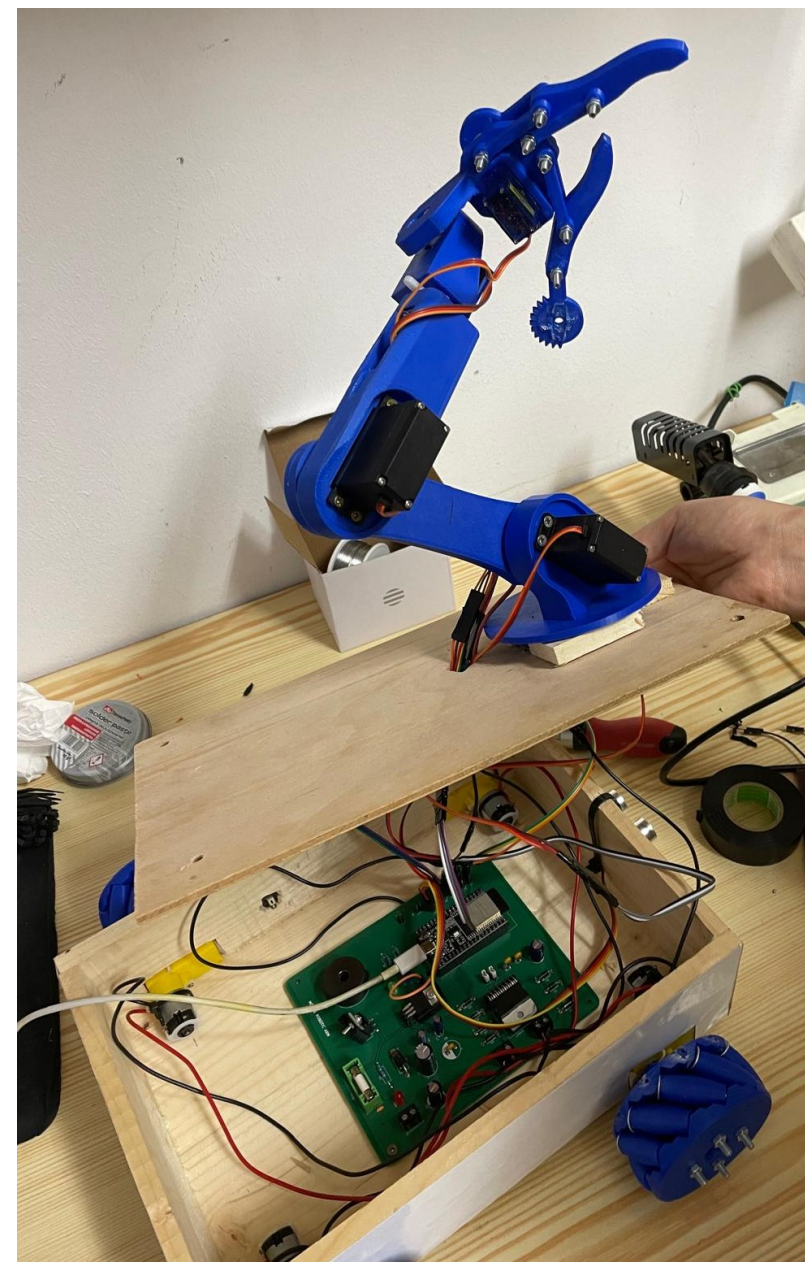




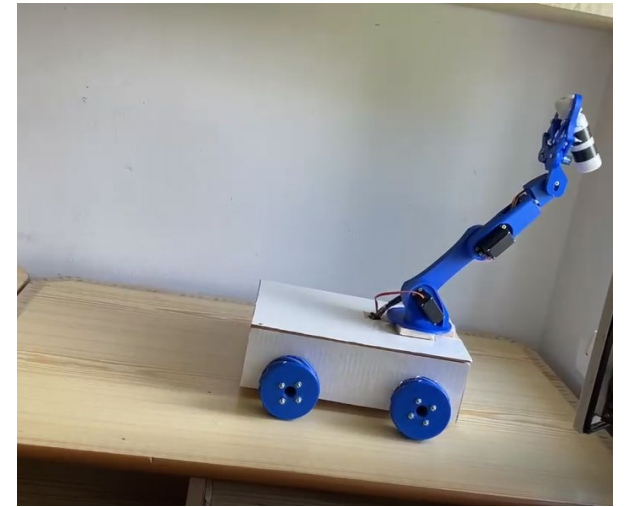
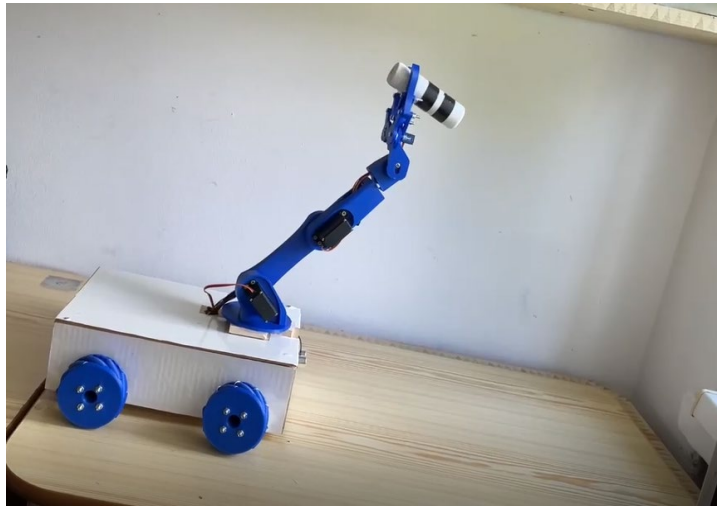
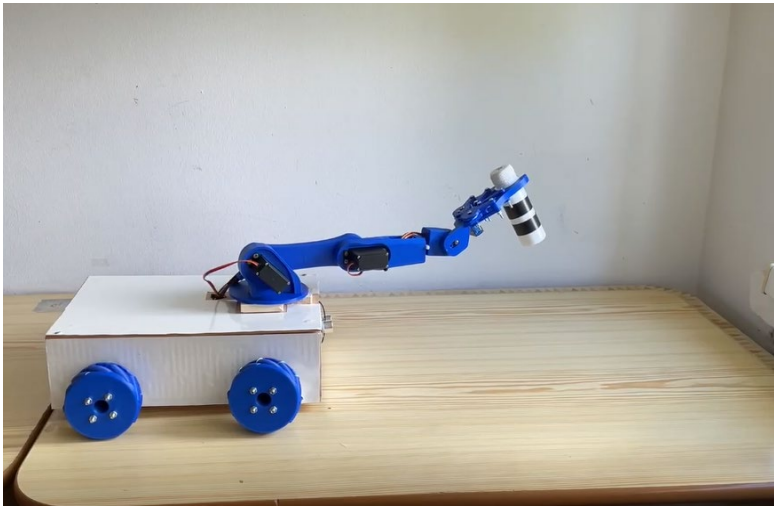
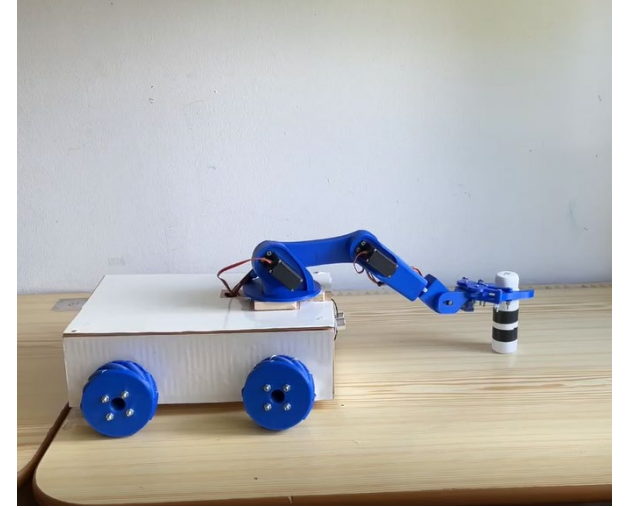
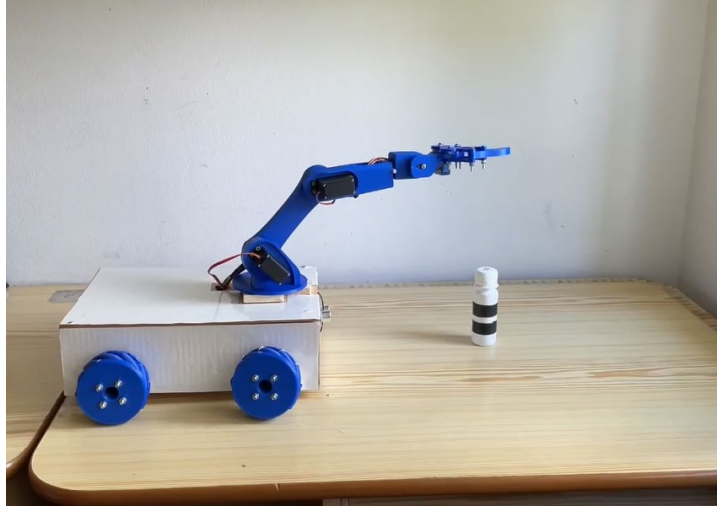
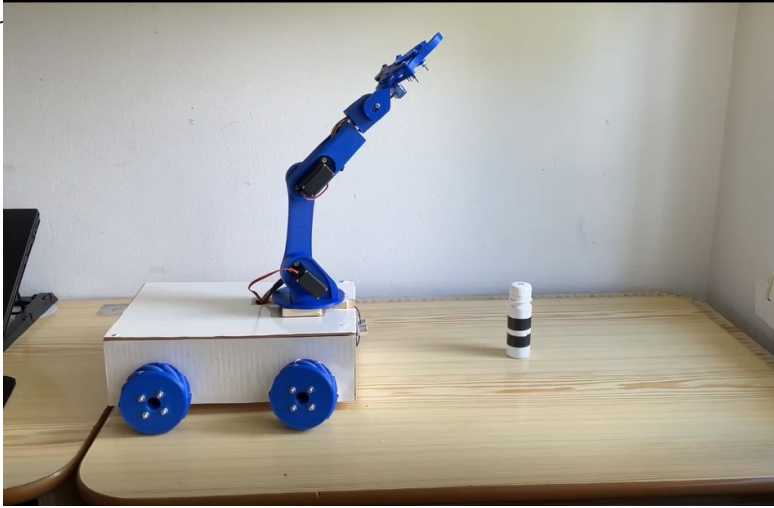


**Ultrasonic  
sensor**

**ON/OFF button**



# Frames



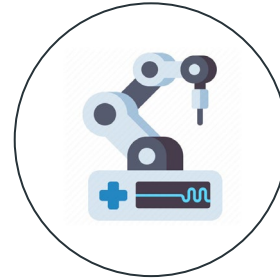


# Real-world applications



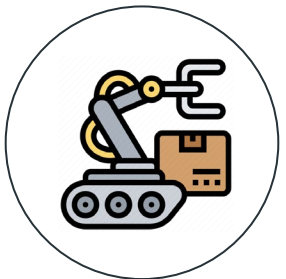
## Manufacturing

- Assembly lines
- Quality control



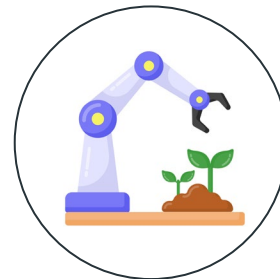
## Healthcare

- Distribution of medicines



## Warehousing

- Sorting and picking
- Inventory management

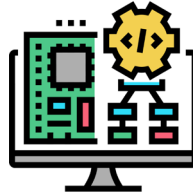


## Agriculture

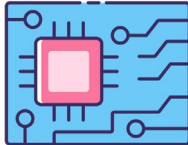
- Planting and harvesting
- Monitoring

# Skills acquired and competenceis

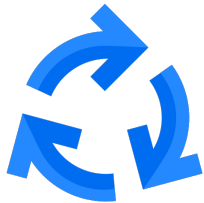
**Software Development**



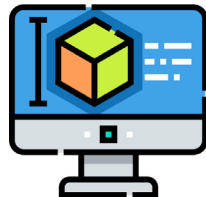
**PCB Design**



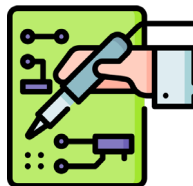
**V-cycle**



**3D Design**



**Soldering Electronics**



**Technical**

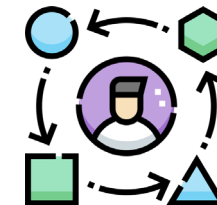


**Teamwork**



**Time management**

**Non-technical**



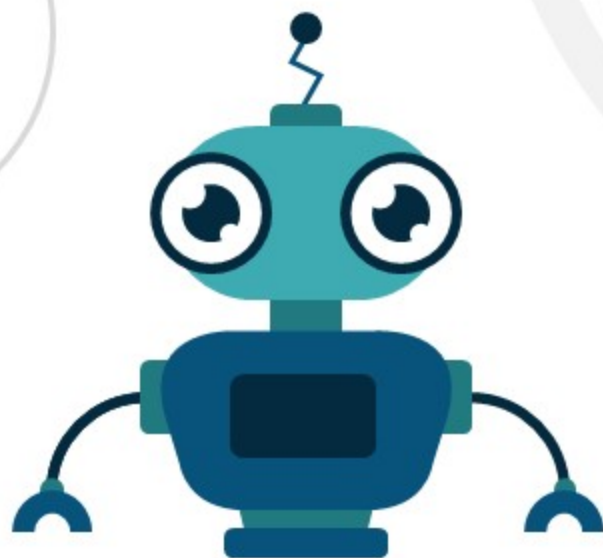
**Adaptability**



**Problem-solving**



**Networking**



# THANK YOU

Add your own text here