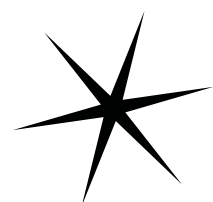
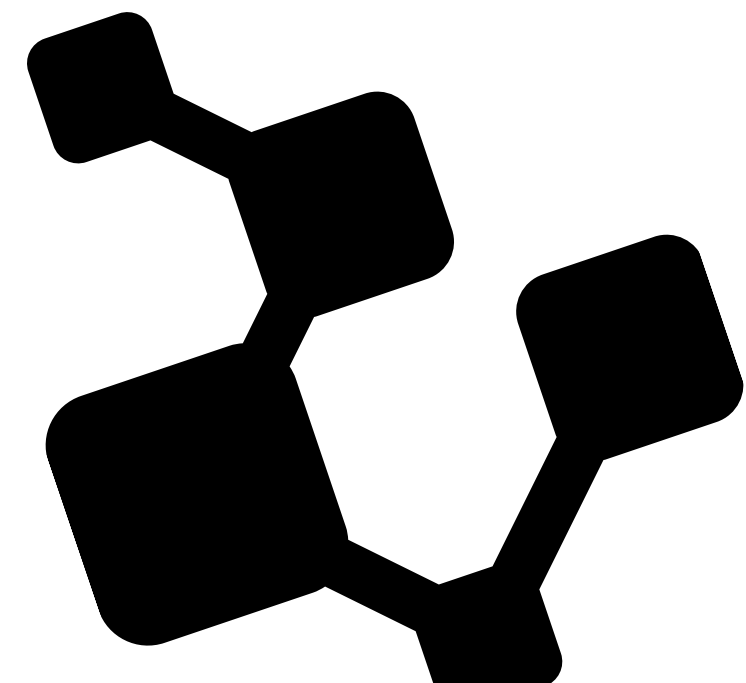


LINE FOLLOWER



project by Claudia-Teodora
Chira & Paul-Ioan Stan



AGENDA

MAIN TOPICS:

- Robot Description
- Components
- Mechanism
- Usage





The image is a collage. In the top-left and bottom-right corners, there is a stylized black logo consisting of a central square with four lines extending from its corners to four smaller squares. In the center, a bright yellow banner with a black border contains the text 'MEET BOSTĂNEL' in bold black capital letters. The letter 'O' is replaced by a black wheel icon. Two custom-built robots are shown. The robot in the top-right is a small car with a blue microcontroller board, two ultrasonic sensors mounted on top, and two blue servo motors driving the wheels. The robot in the bottom-left is a larger car with a wooden chassis, a breadboard with various electronic components, two ultrasonic sensors, and a black battery pack.

MEET BOSTĂNEL

A line follower robot is designed to follow a specific path, typically represented by a black line on a white surface or a white line on a black surface, thanks to an IR sensor. Additionally, using an ultrasonic sensor, Bostanel can avoid obstacles .



**SIMPLE YET
EFFECTIVE**



COMPONENTS

2 MH- B IR (INFRARED) SENSORS

for line detection

H BRIDGE L298N MOTOR DRIVER & 4 DC MOTORS

for controlling motors &
movement

3 RGB LED DIODES

for signaling the state of the
robot regarding the path

1 HC-SR04 ULTRASONIC SENSOR

for computing the distance to
objects

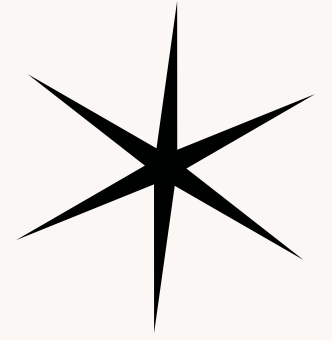
1 SG90 SERVOMOTOR

for ensuring a broad angle of
distance deduction

WIRES

for establishing connection
between components

DEEPER DIVE - SENSORS



ooo

ULTRASONIC SENSOR

- emits high-frequency sound pulses
- when the sound reaches an obstacle, it bounces back as an echo
- the time for the echo to return is then measured
- the microcontroller calculates the distance to the object and acts accordingly

ooo

INFRARED SENSOR

- the emitter shines infrared light onto the floor
- the sensor detects the of the reflected IR light
- the white surface reflects most IR light back to the sensor (LOW signal)
- the black line absorbs most IR light, reflecting very little (HIGH signal)

MECHANISM-FEEDBACK CONTROL

SENSING

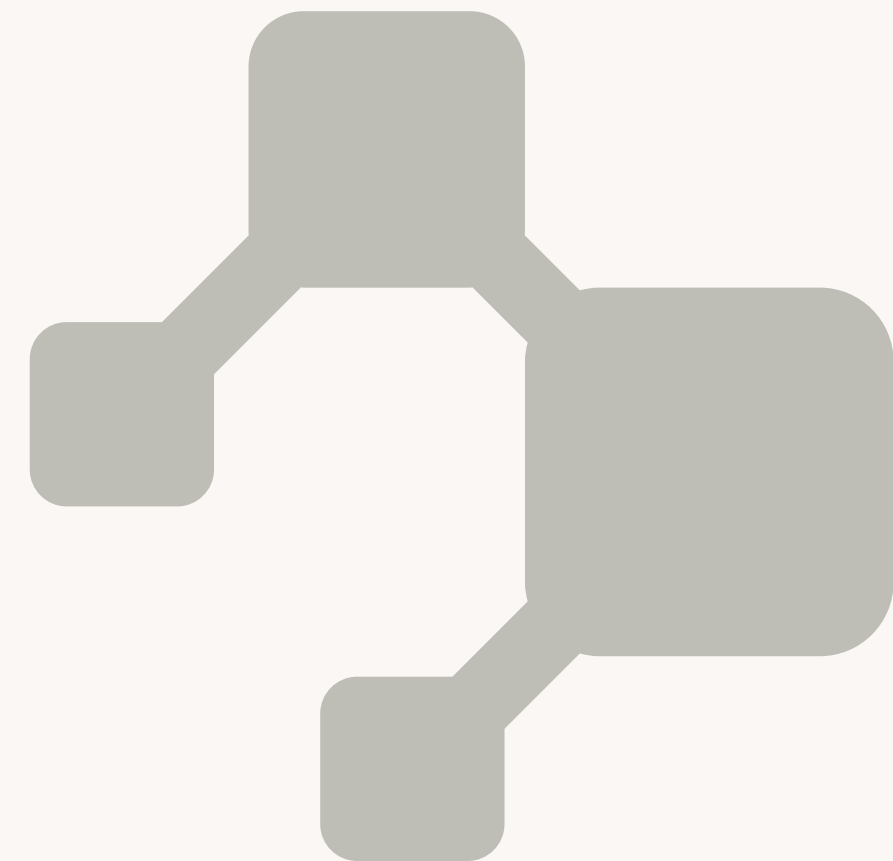
The sensors constantly scan the ground and environment to assure the robot is placed on the line (usually dark color), off the line (usually light color) or in a close proximity of an obstacle

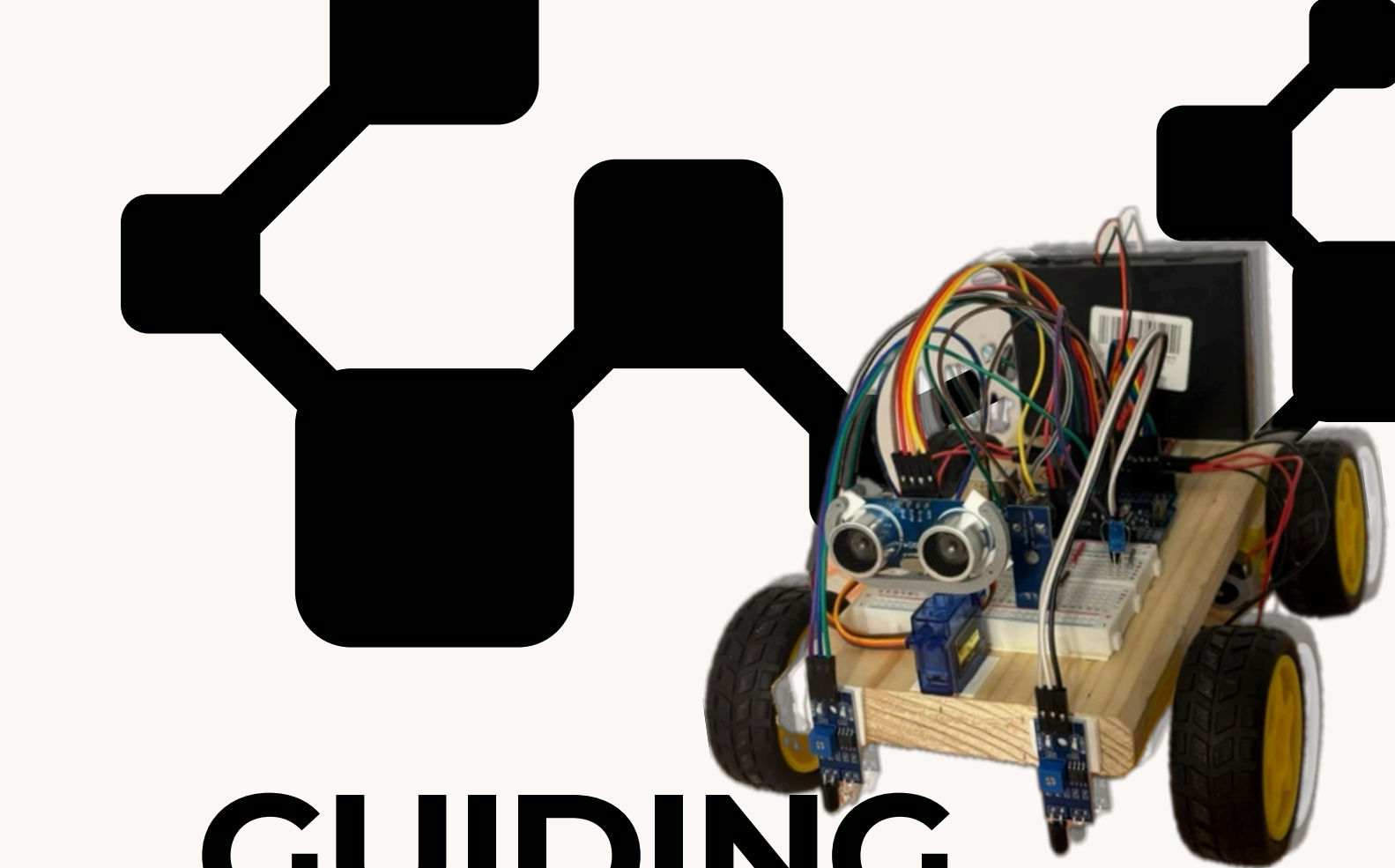
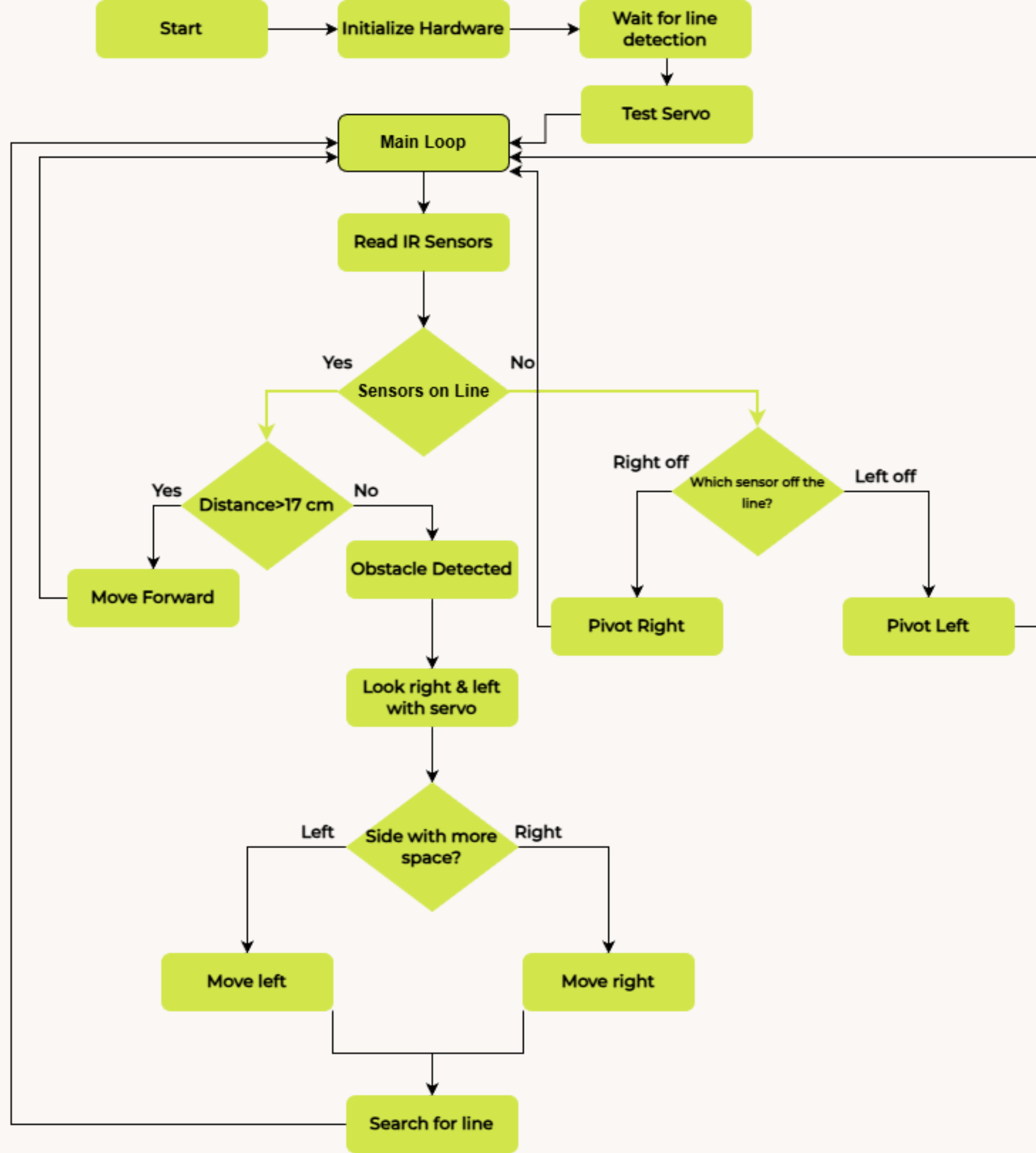
PROCESSING

The data harvested through the sensors reaches Bostanel's "brain", the microcontroller, that makes a decision

ACTUATING

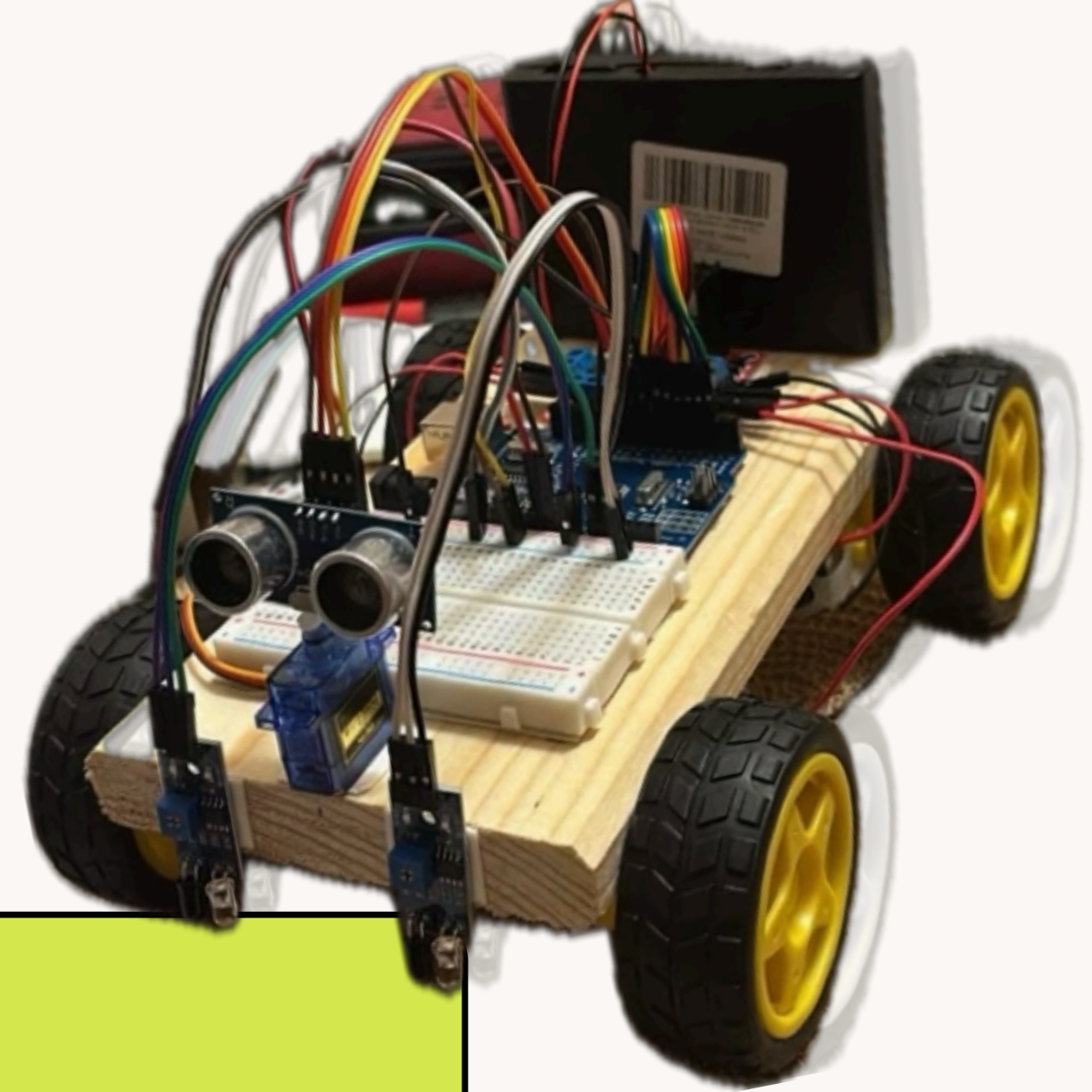
The microcontroller commands the wheels to either speed up, slow down, swerve left/right to adjust direction





GUIDING FLOWCHART

USAGE - LARGER SCALE



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INDUSTRY & WAREHOUSES

Developed into a more advanced form, an AVG (Automated Guided Vehicle), it is used to transport parts/components between production lines

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EDUCATION & STEM

Visual tool heavily used, great for teaching coding, electronics and the basic principles of robotics

RECORDED DEMO





THANK YOU

QUESTIONS?