LINE FOLLOWER

project by Claudia-Teodora
Chira & Paul-Ioan Stan

AGENDA

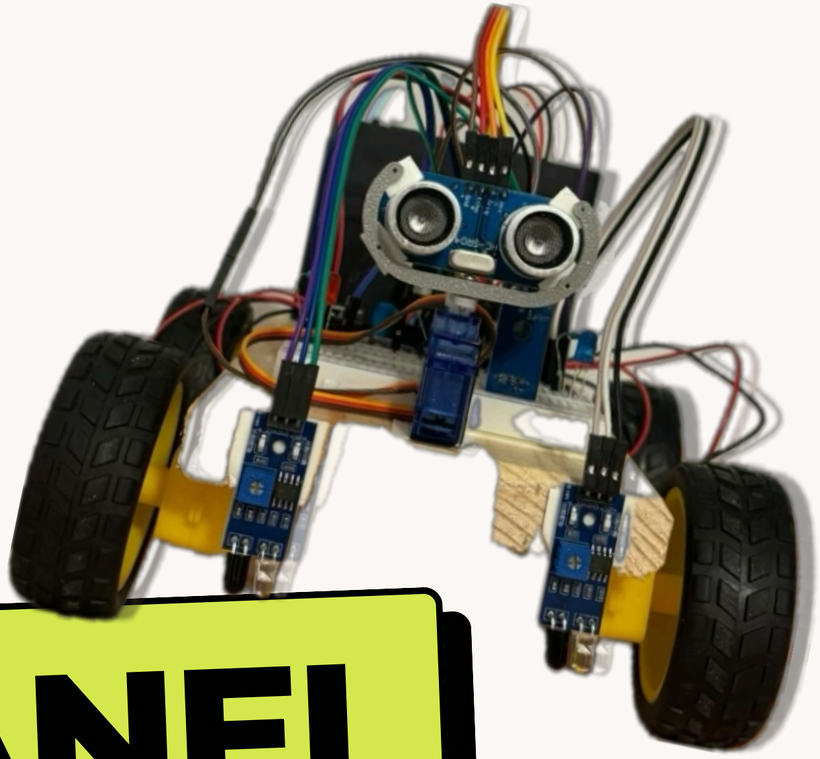
MAIN TOPICS:

-Robot Description

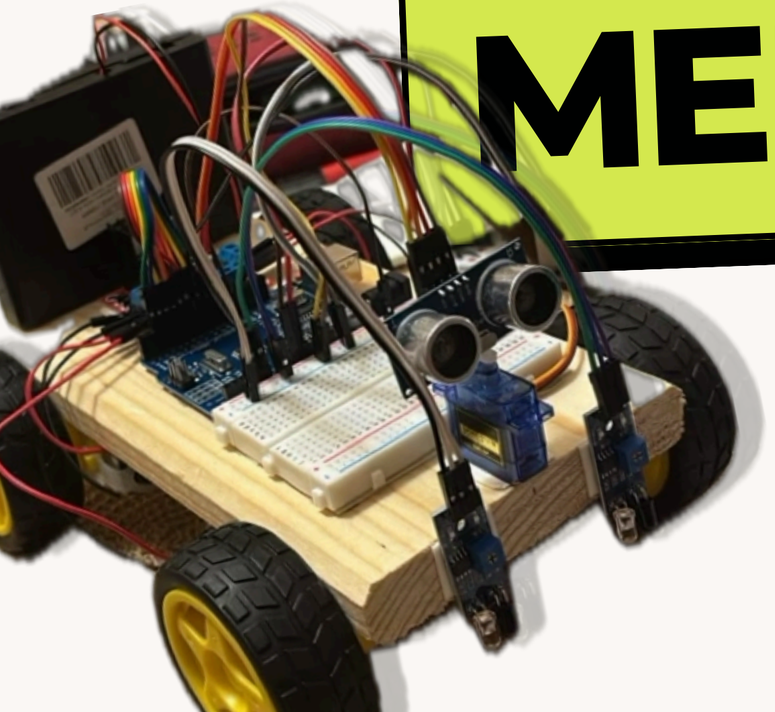
-Components

-Mechanism

-Usage



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

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

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

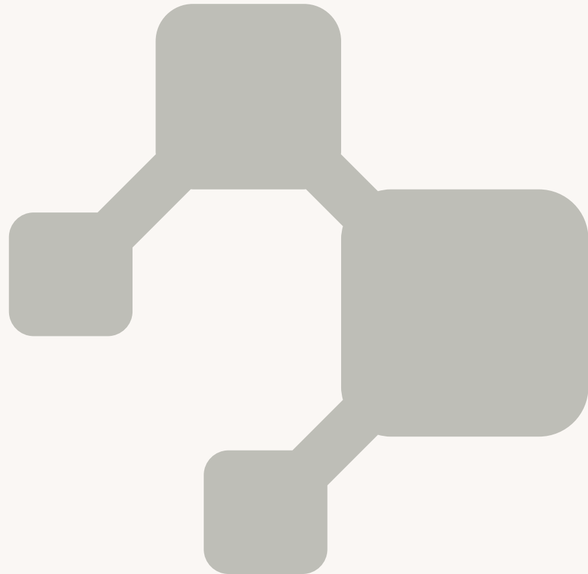
The sensors constantly scan the ground and environment to assure the robot is placed on the line (usually dark color), off the line(usually light color) or in a close proximity of an obstacle

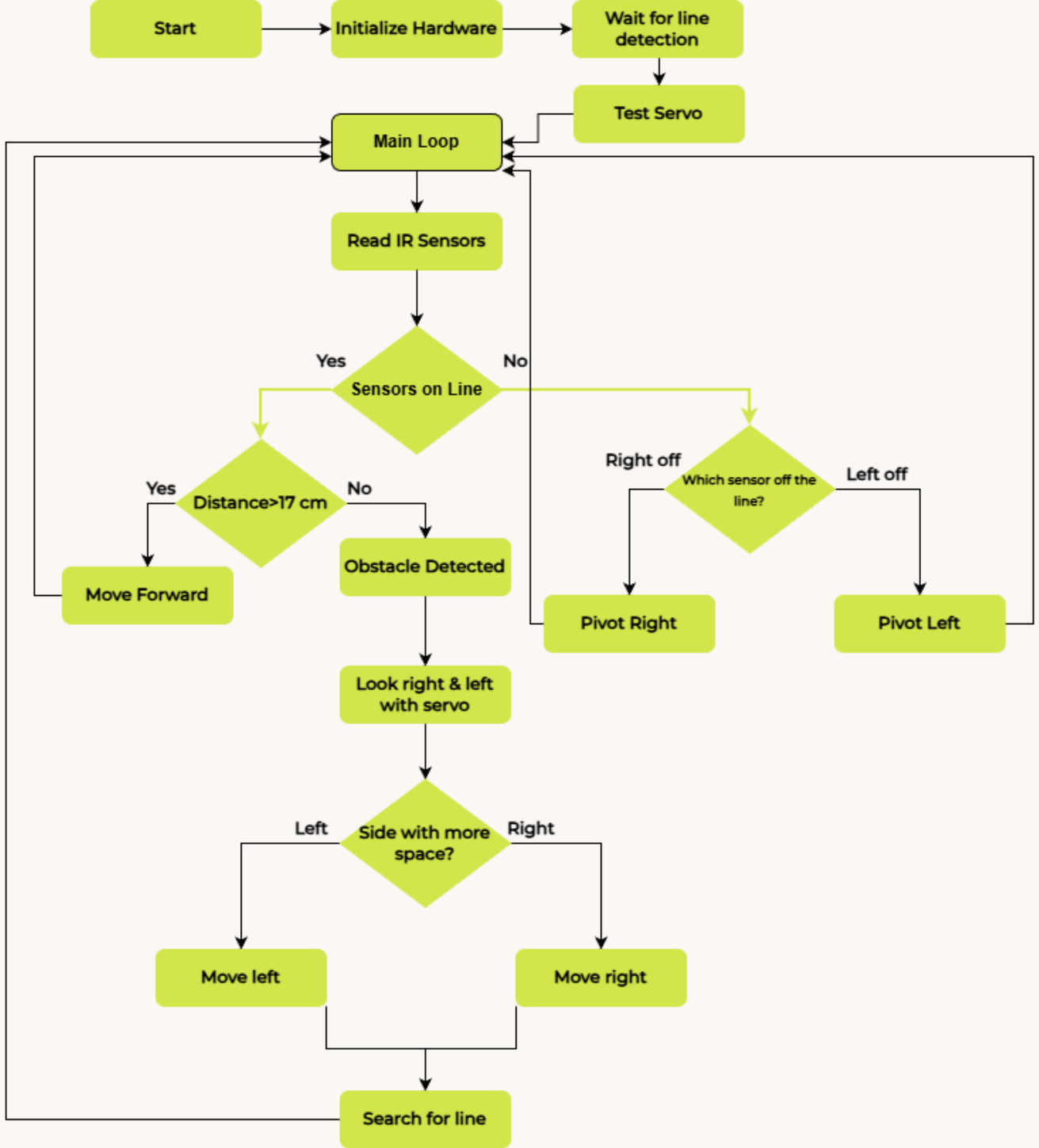
PROCESSING

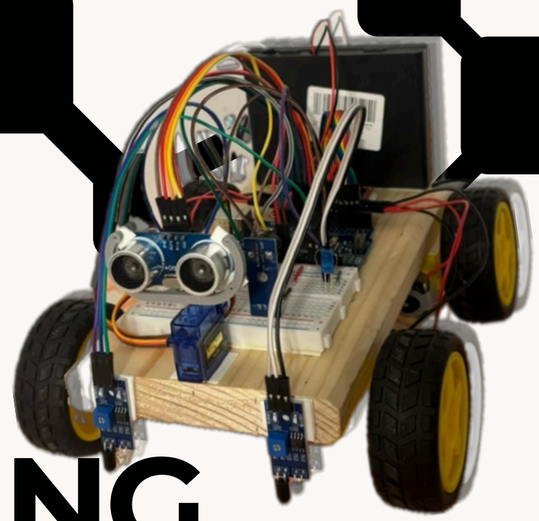
The data harvested through the sensors reaches Bostanel's "brain", the microcontroller, that makes a decision

ACTUATING

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

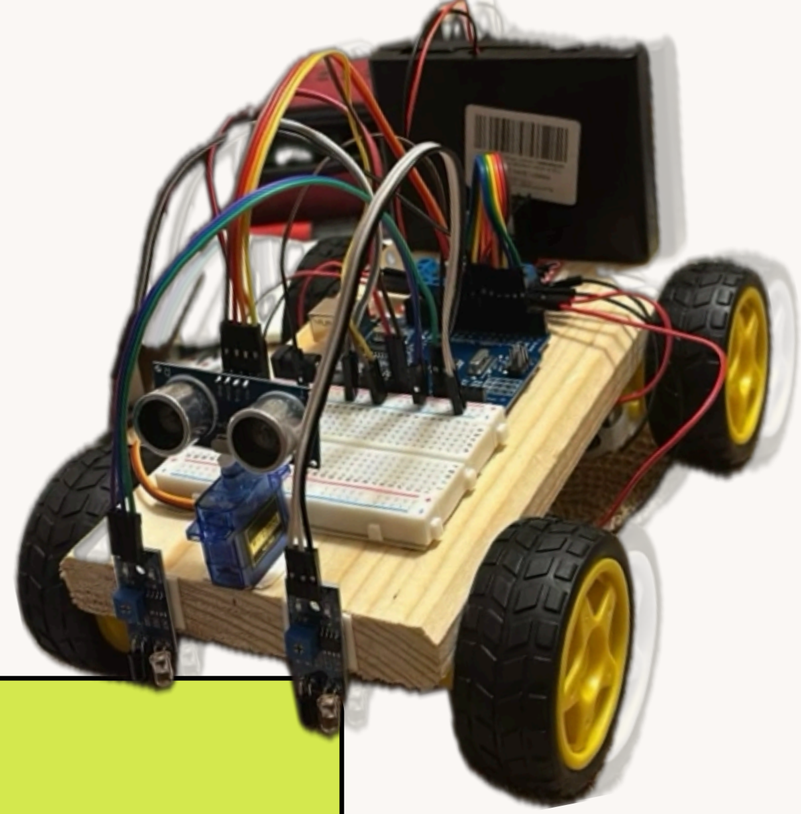






GUIDING FLOWCHART

USAGE - LARGER SCALE



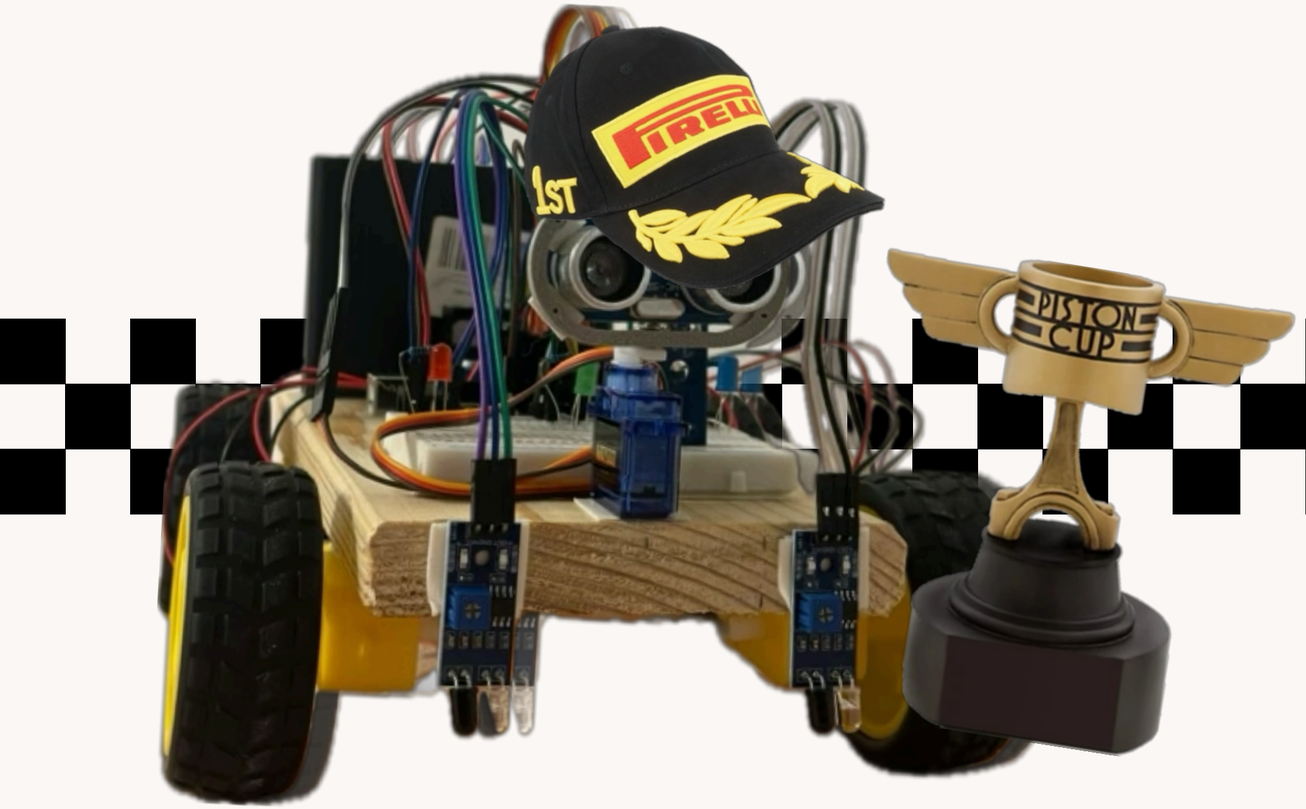
INDUSTRY & WAREHOUSES

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

EDUCATION & STEM

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

RECORDED DEMO



THANK YOU

QUESTIONS?