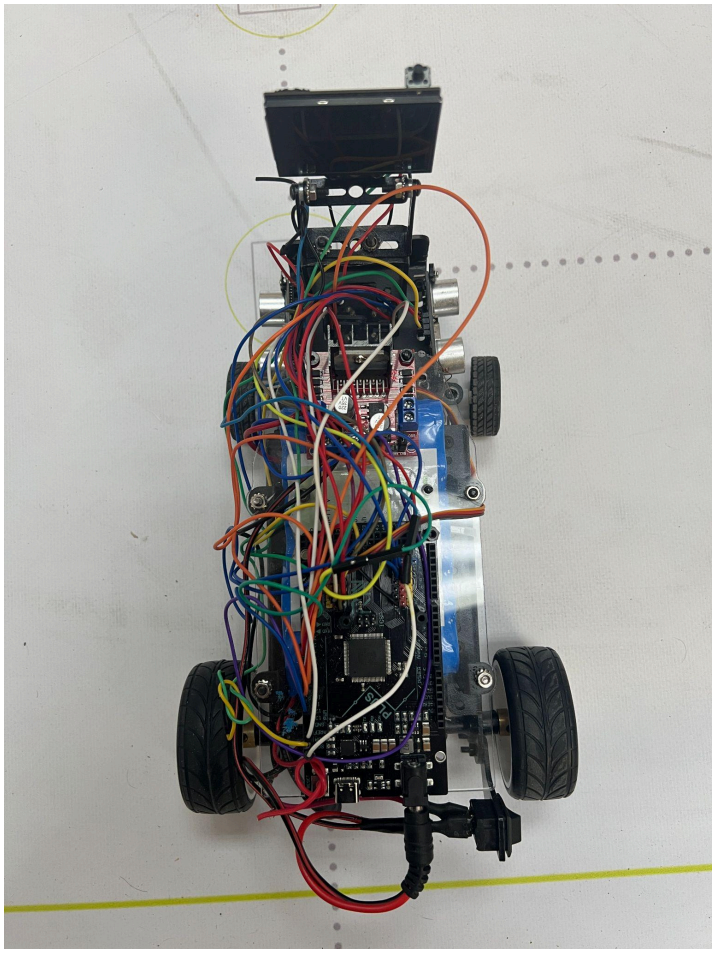
Report About Our Robot



Saudi Eagles

Description

Since the inception of the 'Saudi Eagles' project, our team has been driven by a singular vision: to engineer a vehicle that seamlessly integrates mechanical, electrical, and artificial intelligence capabilities into a cohesive unit. Through persistent effort and determination, we have successfully developed a system that is both autonomous and efficient, carefully selecting components that enhance the overall performance of our vehicle.

One of the most significant challenges we faced was achieving harmonious interaction among the various elements of the vehicle without compromising any of its operational dynamics. This required extensive research and innovative problem-solving to ensure that each component worked effectively with the others.

Our vehicle is constructed using a lightweight aluminum chassis, which contributes to its agility and efficiency. It is powered by a 12V rechargeable lithium battery, ensuring sustainability and extended functionality. The vehicle utilizes an Arduino-compatible board, coupled with a dedicated motor drive control system. To enhance its navigational capabilities, we have incorporated three ultrasonic sensors that measure distance from three distinct directions. Additionally, a color sensor is included to detect colors on various surfaces, while an artificial intelligence camera is equipped with multiple programs for color and object recognition.

An interactive screen has been integrated into the system to display real-time footage from the camera, allowing for better operational oversight. To control the direction of the vehicle, a servo motor is employed for steering, complemented by a differential mechanism that effectively transfers power from a single motor to two wheels. The vehicle is designed with wide rubber wheels and motors capable of operating at 300 rpm, providing both stability and speed.

In the development phase, we exercised meticulous care in writing our code, scrutinizing each line to eliminate errors and ensure robust software performance. To reinforce the reliability of our programming, we developed two distinct code versions and conducted multiple tests on the vehicle. This rigorous

testing process was essential to confirm the precision of our work and to guarantee that our achievements were not merely coincidental, but rather the result of careful planning and execution.

Through these efforts, we are proud to present a vehicle that not only meets our initial goals but also sets a foundation for future advancements in autonomous vehicle technology.

Ultrasonic sensor US - 100

An ultrasonic sensor is a device that uses ultrasonic sound waves to detect the distance to an object, such as the walls or pillars. An ultrasonic sensor transmits and receives ultrasonic pulses using a transducer to determine the proximity of an item. We put two ultrasonics, one on the left and the second one on the right of our car, Then programmed them to detect and bypass objects.

RNAI Arduino Mega 2560

A microcontroller board based on the ATmega2560 is called the Arduino Mega 2560. There are sixteen analog inputs, sixteen digital input/output pins (15 of which can be utilized as PWM outputs), four hardware serial ports, sixteen USB ports, an ICSP header, a power jack, and a reset button.

Servo MG995

Several radio-controlled vehicles, including cars, helicopters, and aircraft, use the high-velocity MG995 Metal Gear Servo Motor. It can rotate 180 degrees, or 60 degrees in each direction. Delivered are 10 kg/cm at 4.8 V and 12 kg/cm at 6 V. PWM signals are processed and received by this digital servo motor more rapidly and effectively.

DC Motor 12V 1200 RPM

The most prevalent kind of motors are direct current (DC) motors. One positive lead and one negative lead are commonly found in DC motors. The motor will start if you connect these two lines straight to a battery. The motor will turn the other way if the leads are switched.

The L298N Motor Driver

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Batteries

We used (6) lithium 12-volt batteries

MPU 9250

The MPU-9250 can measure rotation using its on-chip gyroscope with four programmable full-scale ranges of ±250°/s, ±500°/s, ±1000°/s and ±2000°/s that can be set by the user. The integrated 16-bit ADCs simultaneously sample the 3 axis of rotation around the X, Y and Z axes. The sample rate can be adjusted

from 3.9 to 8000 samples per second. The axis of rotation is relative to the X, Y and Z shown to the right.

HuskyLens AI Camera

A simple-to-use AI camera is HuskyLens. With a single click, it can be trained to identify objects, faces, and colors. As it learns more, its intellect increases. HuskyLens can detect faces at a rate of thirty frames per second because to the application of cutting-edge AI technology. With HuskyLens, you can connect to Arduino, Raspberry Pi, LattePanda, or micro:bit and create very creative projects without worrying about complex algorithms. HuskyLens aims to be the most straightforward AI camera. Numerous image processing methods are already included. You may switch between the methods by pressing buttons, and it can recognize and pick up new objects from photos. HuskyLens also has a 2.0-inch display, so you get exactly what you see.

Future Engineers Rules

https://www.wrosaudi.com/public/uploads/competions/files/competion_file_en_1095060983.pdf

Our Socials

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YouTube Channel Link

https://www.youtube.com/@saudieagles24

Team Members

Sara AlKhuzayim
Shahad AlDossary

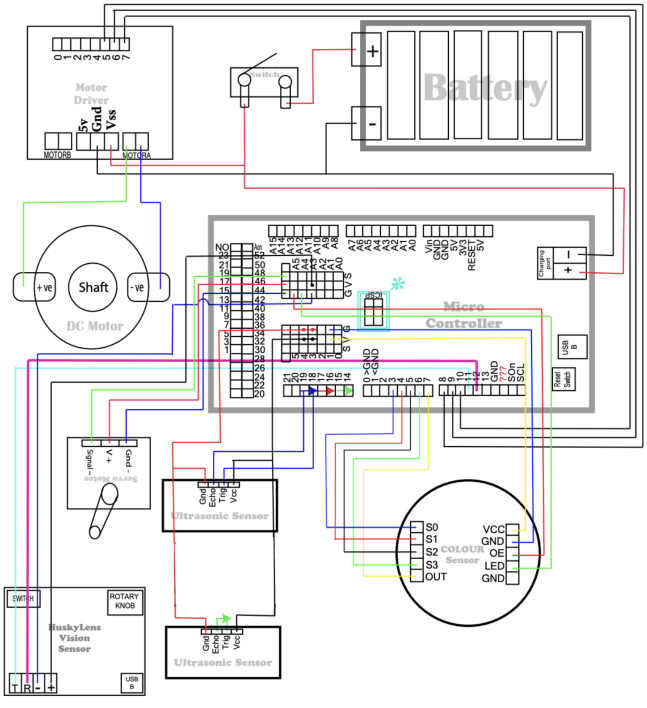
Team Coach

Malak AlSalem

About Us

Our team is aspiring to compete in the nationals and to continue representing our nation in future competitions.

Our 2D Circuit Diagram:

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