**Project Document - WRO Future Engineers 2025**

**Team representing Argentina**

Our team is participating in the \*Future Engineers\* category of the World Robot Olympiad (WRO) 2025 with a project fully developed in Argentina. The objective of our work is to build an autonomous robot capable of moving, detecting obstacles, and analyzing its environment through computer vision.

**Technical description of the project**

The system is based on an \*\*Arduino Mega 2560\*\* board, which serves as the main control unit. This platform was chosen due to its versatility, the large number of input/output pins available, and its reliability in educational robotics projects.

For environment perception, we incorporated \*\*ultrasonic sensors\*\* that measure distances and allow real-time collision avoidance. In addition, we integrated an \*\*ESP32-CAM\*\*, used as a vision module for image capture and basic environment analysis. This combination of sensors provides a robust system that enables the robot to make autonomous navigation decisions.

**Development time**

The design, assembly, and programming of the robot were completed in approximately \*\*two weeks\*\*, with intensive work on hardware and software integration, as well as sensor calibration to achieve reliable performance under different conditions.

**Project objective**

The main purpose of this development is to demonstrate how educational robotics, using accessible components such as Arduino and ESP32, can be a gateway to more advanced solutions in automation and artificial intelligence. Our intention is to showcase the potential of young people from Argentina in the technological field, highlighting our team's commitment, creativity, and innovation capacity.