**THE GOLDEN DRAGON Team’s Rescue Maze Robot  
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**Audience and Purpose**

**This document is intended for the judges, inspectors, competitors, and any other individuals interested in gaining an in-depth understanding of the technical intricacies of our robot. The primary purpose of this document is to provide comprehensive insight into the design, functionality, and operational capabilities of our autonomous rescue maze-solving robot.**

**Definition and Function**

**The Golden Dragon Rescue Maze Robot is a fully autonomous robotic system engineered to navigate through hazardous and perilous environments. It performs all essential tasks expected of a high-performance rescue robot, including maze traversal, victim detection, and strategic deployment of rescue kits. Furthermore, it efficiently avoids obstacles, water hazards, and structural voids to ensure seamless operation. The ultimate objective behind its development is to contribute to future advancements in life-saving robotic technology.**

**Overview**

**The robot is designed with a compact, yet robust structure, featuring four wheels and eight ultrasonic sensors—four positioned at the front and two on each side. It is equipped with a high-precision compass, an integrated camera system, three illumination units, and a central processing unit, all housed within a 15x15x15 cm framework.**

**Components and Functionality**

**The robot advances autonomously in four-second intervals, periodically halting to process data received from its array of sensors. These sensors provide real-time spatial analysis, allowing the robot to execute appropriate navigational commands. The ultrasonic sensors continuously measure distances from surrounding walls, ensuring optimal pathfinding within the maze.**

**Victim identification is facilitated through an advanced camera system capable of detecting individuals and assessing their condition based on color differentiation. Upon identification, the robot dispenses precise quantities of medical supplies accordingly. Additionally, a color-sensing module positioned beneath the robot enables terrain recognition, allowing it to adapt its movements based on environmental cues.**

**The propulsion system comprises high-torque MG995 servo motors, ensuring smooth and responsive mobility. All computational processes, including data acquisition and execution of commands, are managed by an Arduino Mega 2560 microcontroller, which serves as the core processing unit of the robot.**

**References**

**To develop and refine this robotic system, we utilized various educational and technical resources, including:**

* **Arduino Documentation (Programming & Hardware Integration)**
* **Arduino - راهنمای آردوینو (Persian Arduino Guide)**
* **YouTube Tutorials (Algorithm Development & Sensor Calibration)**
* **Numerous Online Technical References & Research Papers**

**Conclusion**

**Thank you for investing your time in reviewing this document. We hope it provides valuable insight into the innovative engineering and functional capabilities of our rescue maze robot. Our team is committed to advancing robotic solutions that contribute to the betterment of humanity through cutting-edge technology.**