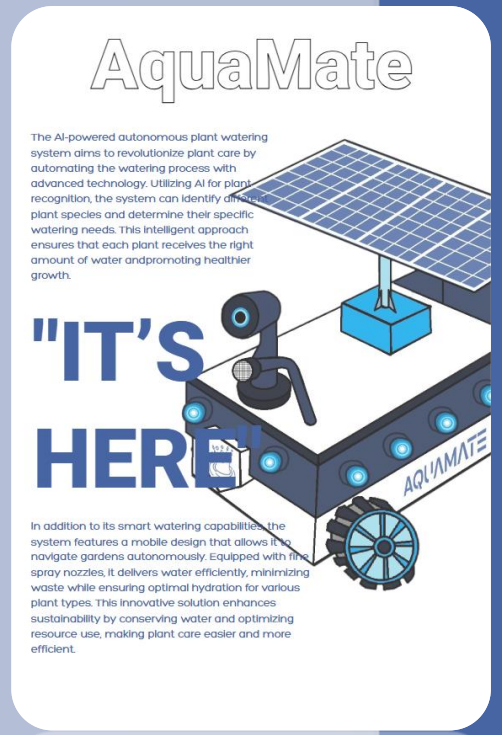


AQUAMATE

AI DOES THE WORKING, SUN DOES THE CHARGING, PLANTS DO THE GROWING,YOU DO THE RELAXING.

AUTONOMOUS SYSTEM PROTOTYPE

SENSOR-BASED DECISION MAKING & NAVIGATION

Name of the prototype:

AQUAMATE

by safia

INTRODUCTION

THE
CORE
CONCEPT

by safia

INTRODUCTION:

- **Problem Statement:** There is a need for autonomous systems that can sense their environment, make decisions, and act *without continuous human intervention*, especially where precision and efficiency are required, highlighting the need for intelligent autonomous systems.
- **Proposed Solution:** This project presents *AquaMate*, a medium-fidelity AI-driven autonomous system prototype designed to operate without manual intervention once configured. The system concept integrates *camera-based sensing, decision logic, and autonomous navigation* to determine *when* an action should be performed and *how much* is required. The prototype emphasizes *efficient resource usage and autonomous movement*.

by safia

OBJECTIVES AND GOALS:

- To explore camera-based sensing and interpretation
- To model autonomous navigation using visual input
- To design decision logic for task execution
- To understand resource management in autonomous systems

KEY FEATURES:

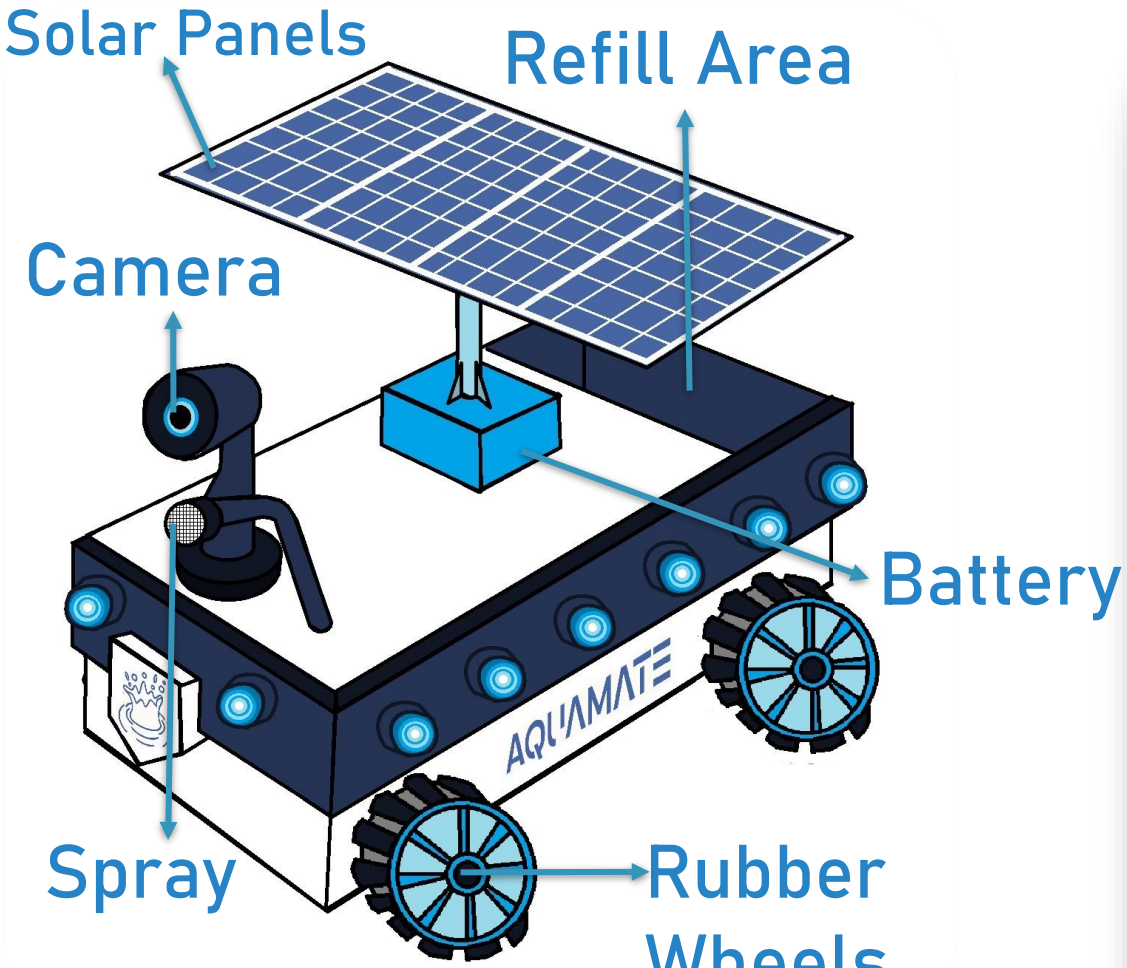
- Requires no manual intervention once configured
- Sensor-driven decision making
- Autonomous navigation using AI through image recognition
- Resource-level monitoring and response Automatic Water refilling mechanism
- Solar power and battery sustainability

by safia

DESIGN AND DEVELOPMENT

Concept and
Implementation

by safia



AQUAMATE

VISUAL REPRESENTATION

by safia

PHYSICAL DESIGN:

- Equipped with camera on top for target detection.
- Solar Panel placed at the top of the container to maximize sun exposure.
- Wire battery to store energy from the solar panel.
- It is portable with lithium-ion battery.
- Sensors for making smart decisions.

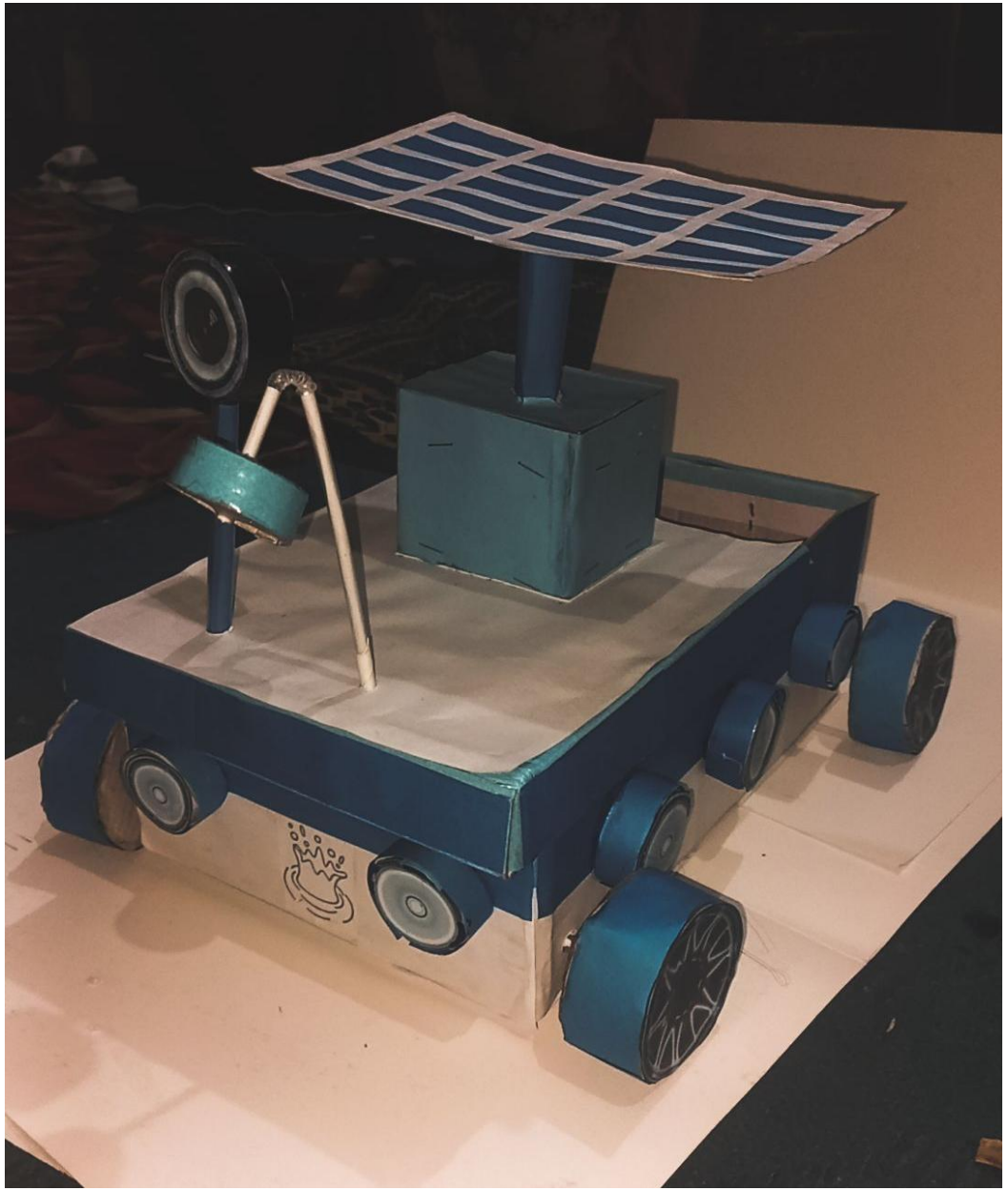
by safia

WORKING MECHANISM:

- **Initialization:** The system powers on and the camera activates it components including open-source AI software.
- **Environment sensing:** The camera continuously captures the image of the environment and the target.
- **Decision processing:** AI process the images to identify the target and asses their needs.
- **Navigation:** The system detects the obstacles on the platform and choose the best route to reach the target.
- **Task execution:** Reaching the plant, the system activates its decision-making process and deliver the efficient task.
- **Resource monitoring:** Water level sensors continuously tracks the water level. When the water level is low, the system is triggered for the refillment.
- **Continuous mechanism:** Camera detects docking station and choose the best route to reach for the refillment of water to the required water level.
- **Source Power:** The solar panel recharges the battery during daylight, allowing the system to operate sustainably. Battery is also available as a backup use.

by safia

VISUAL REPRESENTATION:



by safia

WHAT I LEARNED?

- The concept and idea are an early-stage exploration of system through logic and reasoning. Even though it's a non-functional prototype, it still taught me how physics, numerical data and computing is processed efficiently. This project helped me understand how physics, logic, and computation work together in autonomous and simulated environments strengthening my interest in game physics and system simulation.

Thank you

by safia