A.S.E.R (Agricultural Space Exploration Rover)

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Opportunity: California Space Grant Consortium

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The Agricultural Space Exploration Rover (A.S.E.R) aims to evaluate and gather environmental data through key sensors that will assess the potential of developing agriculture on celestial bodies. The rover will be equipped with multiple sensors that will share an ESP32 board, including an MQ135 gas sensor, a capacitive soil moisture sensor, a BME680 sensor, an NPK sensor, and two HC-SRO4 ultrasonic sensors. Specifically, the BME680 sensor measures the humidity and temperature of the air, along with the atmospheric pressure. The NPK sensor analyzes the amount of nitrogen, phosphorus, and potassium in the soil that is important to understanding the viability of the soil for plant growth. The ultrasonic sensors will be implemented on the back and the front of the rover in order to respond to object detection. A 3d printed arm for the NPK and soil moisture sensor will be implemented in order for the rover to readily access and retrieve environmental data. The 3d arm and rover will be controlled utilizing a joystick module with buttons to move the robotic arm and rover through antennas for wireless communication. The data will be collected through a web server that will display key information collected from the sensors via WiFi.

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