The Lotus 2.0 is a partially autonomous rover that will roam Salton Sea to take data measurements using a number of sensors, including temperature, humidity, and object detection. The user will have control over the rover’s target destinations while the rover takes measurements as it locates to the desired destination. It will be battery-powered, which will be charged through a solar panel. The user will also be able to monitor the rover’s power consumption to make the best use of its runtime before it has to charge up.

**Project Overview**

**Lotus 2.0**

**System Block Diagram**

**Hardware / Key Components**

- **Microcontroller (Arduino)**
  Central system that manages the rover’s mobility, radio communication, power, and sensors

- **LoRa (Transceiver)**
  Sends and receives sensor data (i.e. Temperature, Humidity, GPS) with a range up to 10km+

- **915 MHz Microstrip Antenna**
  Low profile Microstrip antenna designed to resonate at 915 MHz for USA LoRa Modules and wireless networks

- **Temperature & Humidity Sensor**
  Manages system’s mobility, radio communication, power, and sensors

- **GPS & Compass**
  Primary navigation modules guide rover to the user’s desired destination

- **Raspberry Pi Camera**
  Object detection system that identifies wildlife

- **Ultrasonic Sensor**
  Operates in tandem with navigation modules to navigate around obstructing objects and structures

- **Battery and Solar Panel**
  Primary power source, which can be recharged when needed using solar energy

- **Power Accumulator**
  Central power monitoring system that measures the power consumed by each component to ensure maximum power optimization