MARS OASIS

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Introduction

- Control surface for an autonomous greenhouse.
- Systems software + GUI Application (cross-platform)
- **Systems** - monitors and controls a plant life-support system prototype
- **GUI** - displays sensor data to any user/systems engineer to check the status of the relevant data, perform tests, calibrate the sensors, toggle the actuators, etc

Methods & Tools

PLs	- **JavaScript (GUI)** & **Python (Systems)**
Framework	- Ionic (Hybrid Mobile Application)
Libraries	- AngularJS, Node.js, jQuery, (Angular Charts)
Database	- Firebase (NoSQL/JSON)
Testing	- Karma (Test Runner) + Protractor (E2E)
VCS	- GitHub
Build Automation	- Gulp
Package Managers	- Bower & NPM (dependency management)
IDEs	- Xcode & Android Studio + Atom/Sublime Text
Project tracker	- Trello
Methodology	- Agile

Challenges

- Dealing with the sheer size of the data
  - (1,000,000+ entries on some JSON files) which caused massive performance issues
- A struggle for balance between resolution and efficiency
  - sparseness of data vs. granularity
  - real-time data rendering
- Trouble rendering graphs (ended up switching libraries +5 times)
  - resulted in finding one and an extra plugin which made our job easier in the long run
- Trouble with initial testing framework Jasmine
  - dependency injection issues with Angular
- Actuators required tunneling through VPN

Demo