



Dashboard Final Presentation

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Overview

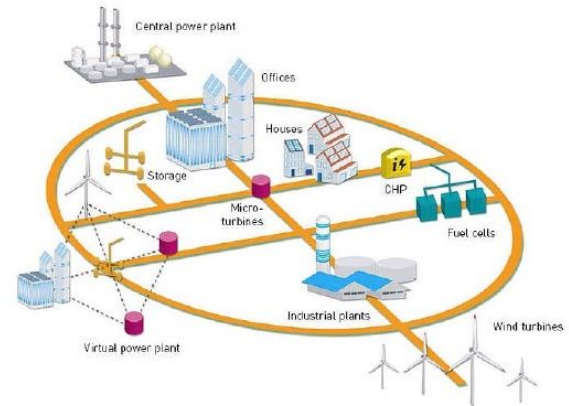
- 1) Project Motivation and Background**
- 2) Project Goals**
- 3) Block Diagrams**
- 4) Accomplishment of Goals**
- 5) Final Status of Project**
- 6) Remaining Problems**
- 7) Future Improvement**

Project Motivation and Background

Project Motivation

- SCEL aims to develop a microgrid for UHM to make Hawaii a more sustainable place to live
- Can be achieved through optimizing the placement of renewable energy source devices
- SCEL uses weatherboxes to collect meteorological data to determine optimal locations around campus
- Dashboard displays this data for anyone with access to see the data

Smart Grid / Micro Grid



Distributed generation (localized) in micro grids and part of a larger smart grid



Project Background

- **Dashboard Version 1**
 - **Used Django**
 - **Little documentation**
 - **May not have APIs the team would need**
 - **Limited customization**
- **Dashboard Version 2**
 - **Uses JavaScript and React**
 - **Open-source documentation available**
 - **Has APIs the team would need**
 - **Customizable**

Project Goals



Project Goals

**Design &
Mockup**



**Generate
Electronic
Copy**



**Create
Design
Document**



**Develop
Minimum
Viable
Product
(MVP)**

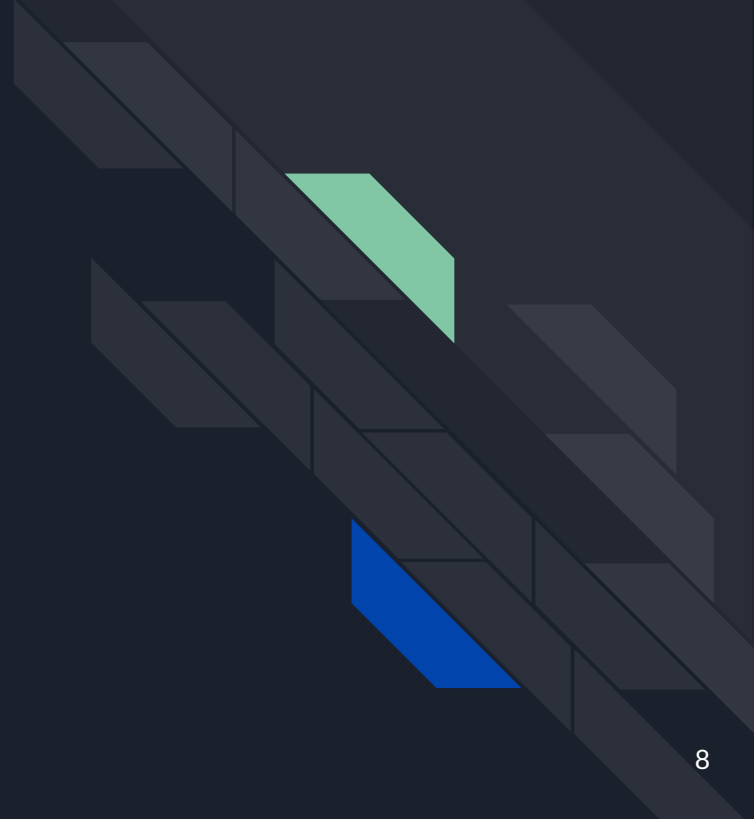


**Re-evaluate
Design
Document**

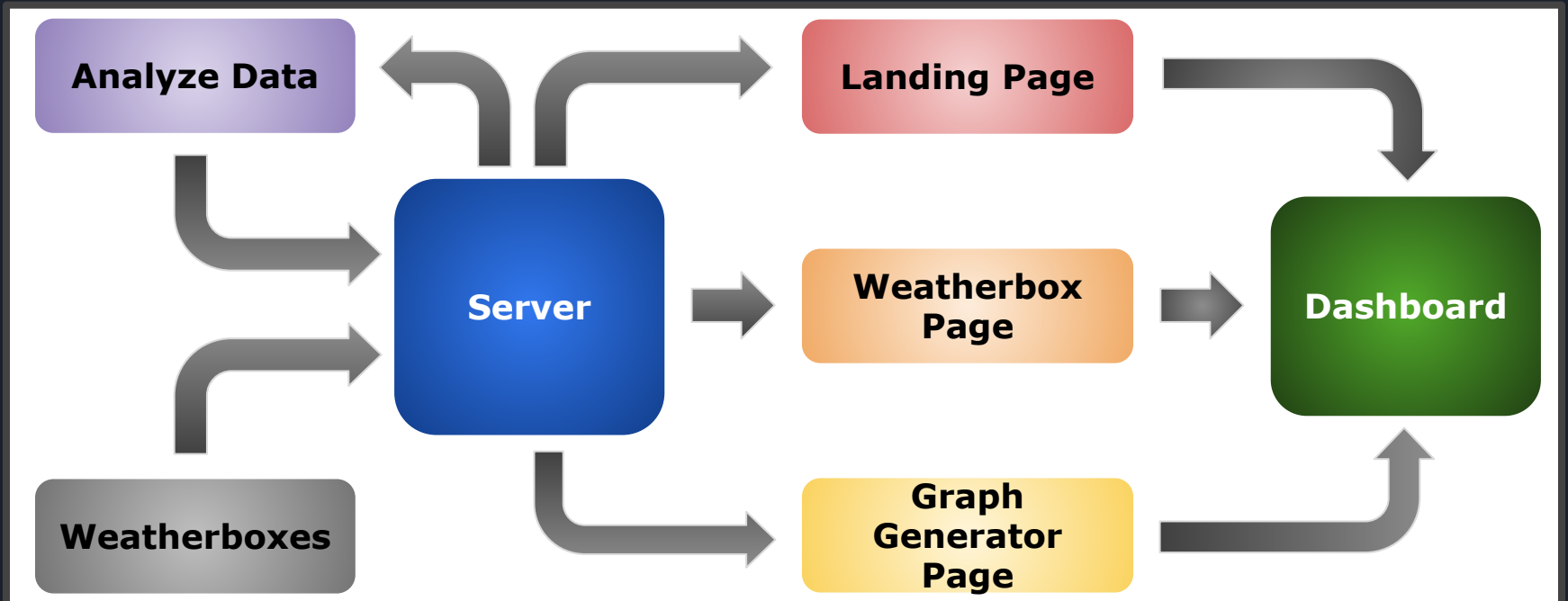


End Goal: Create a functional dashboard (MVP).

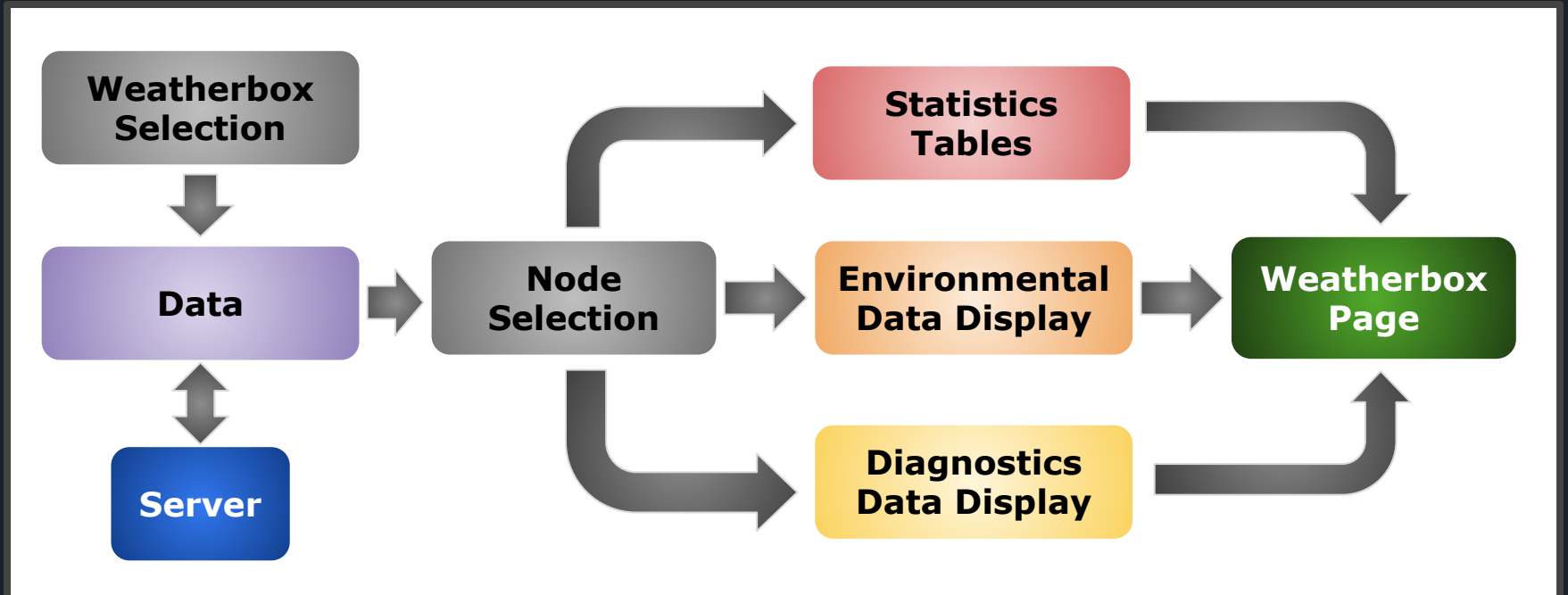
Block Diagrams



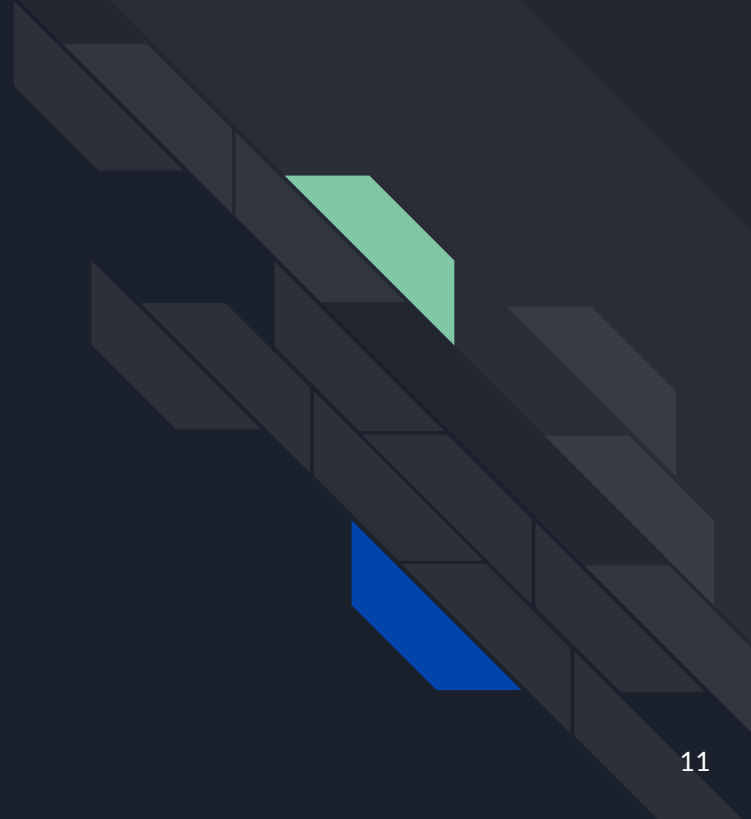
Overall Block Diagram



Weatherbox Page Block Diagram

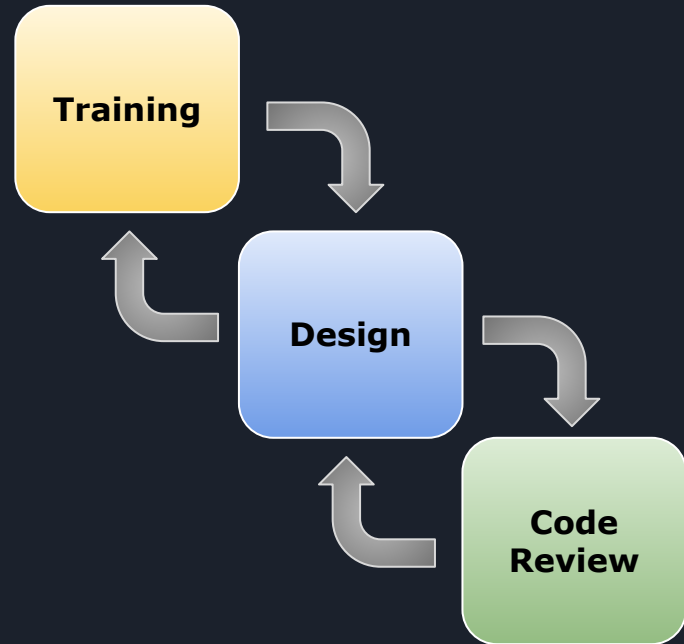


Accomplishments of Goals



Journey to Accomplishments

- 1) Training with exercises and documentations
- 2) Following the five-step design procedure
- 3) Conducting code reviews with teammates





Exercises and Documentations

- **JavaScript and ES6**
 - freeCodeCamp
- **React**
 - **Tic-Tac-Toe**
 - **Button Click Accumulation and Display**
 - **Component Decomposition**
 - **Semantic React Iteration**
 - **Changing Display with Buttons**
- **GitHub**
 - **File Editing, Committing, Pushing, Merging**
 - **Issues and Code Reviews**

Five-Step Design Procedure

**Design &
Mockup**



**Generate
Electronic
Copy**



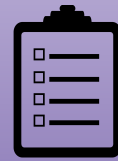
**Create
Design
Document**



**Develop
Minimum
Viable
Product
(MVP)**

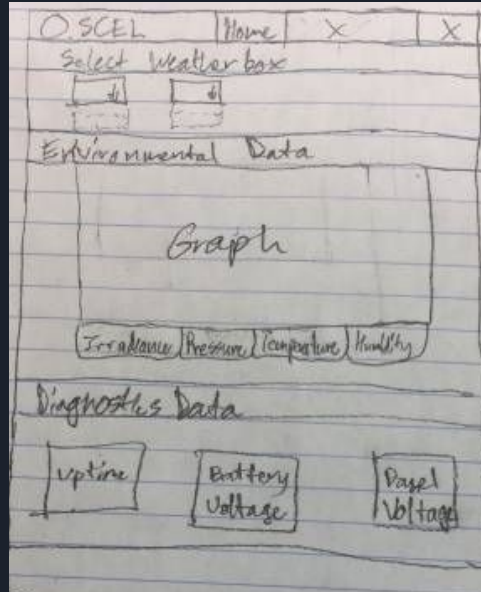


**Re-evaluate
Design
Document**

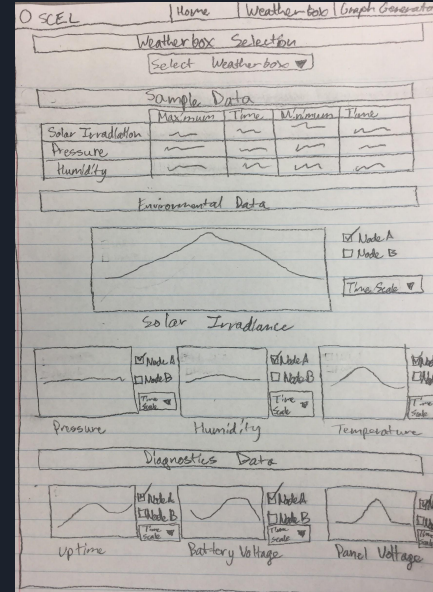


Design documents can be found on SCCL's Wiki.

Mock-Ups



Initial Design



Second Design

Electronic Versions of Mock-Ups

Smart Campus Energy Lab Home Weatherboxes Graph Generator

Weatherbox Selection

Select weatherbox... Select node...

Environmental Data

Environmental Data Graph

Solar Irradiance Pressure Temperature Humidity

Diagnostics Data

Uptime Graph Battery Voltage Graph Panel Voltage Graph

Uptime Battery Voltage Panel Voltage

Initial Design

Smart Campus Energy Lab Home Weatherbox Graph Generator

Weatherbox Selection

Select weatherbox...

Sample Data

	Maximum	Timestamp	Minimum	Timestamp
Solar Irradiation				
Pressure				
Humidity				
Temperature				
Uptime				
Battery Voltage				
Panel Voltage				

Environmental Data

Solar Irradiation

Second Design

Smart Campus Energy Lab Home Weatherbox Graph Generator

Weatherbox Selection

Select weatherbox...

Statistics Tables

Mean of Recently Processed Data

Node #	Solar Irradiation	Pressure	Humidity	Temperature	Uptime	Battery Voltage	Panel Voltage
1							
2							
3							

Standard Deviation of Recently Processed Data

Node #	Solar Irradiation	Pressure	Humidity	Temperature	Uptime	Battery Voltage	Panel Voltage
1							
2							
3							

Recent Environmental Data

Node #	Solar Irradiation	Timestamp	Pressure	Timestamp	Humidity	Timestamp	Temperature	Timestamp
1								
2								
3								

Recent Diagnostics Data

Current Design

Minimum Viable Product (MVP): Weatherbox Selection

The screenshot shows a web browser window displaying a React application. The browser's address bar shows 'localhost:3000/weatherpage'. The application has a navigation bar with 'Home', 'About', and 'Contact' links. The main content area features a green header with the text 'Weatherbox Selection'. Below this is a dropdown menu currently showing 'Apple' with a small green apple icon, and two other options: 'Apple' with a green apple icon and 'Cranberry' with a red cranberry icon. Below the dropdown are two identical tables. The first table is titled 'Mean of Recently Processed Data' and the second is titled 'Standard Deviation of Recently Processed Data'. Both tables have 8 columns: 'Node #', 'Solar Irradiation', 'Pressure', 'Humidity', 'Temperature', 'Uptime', 'Battery Voltage', and 'Panel Voltage'. Each table has 3 rows, with the first row containing the numbers 1, 2, and 3 in the 'Node #' column, and the remaining cells being empty.

Weatherbox Selection

Apple

Apple

Cranberry

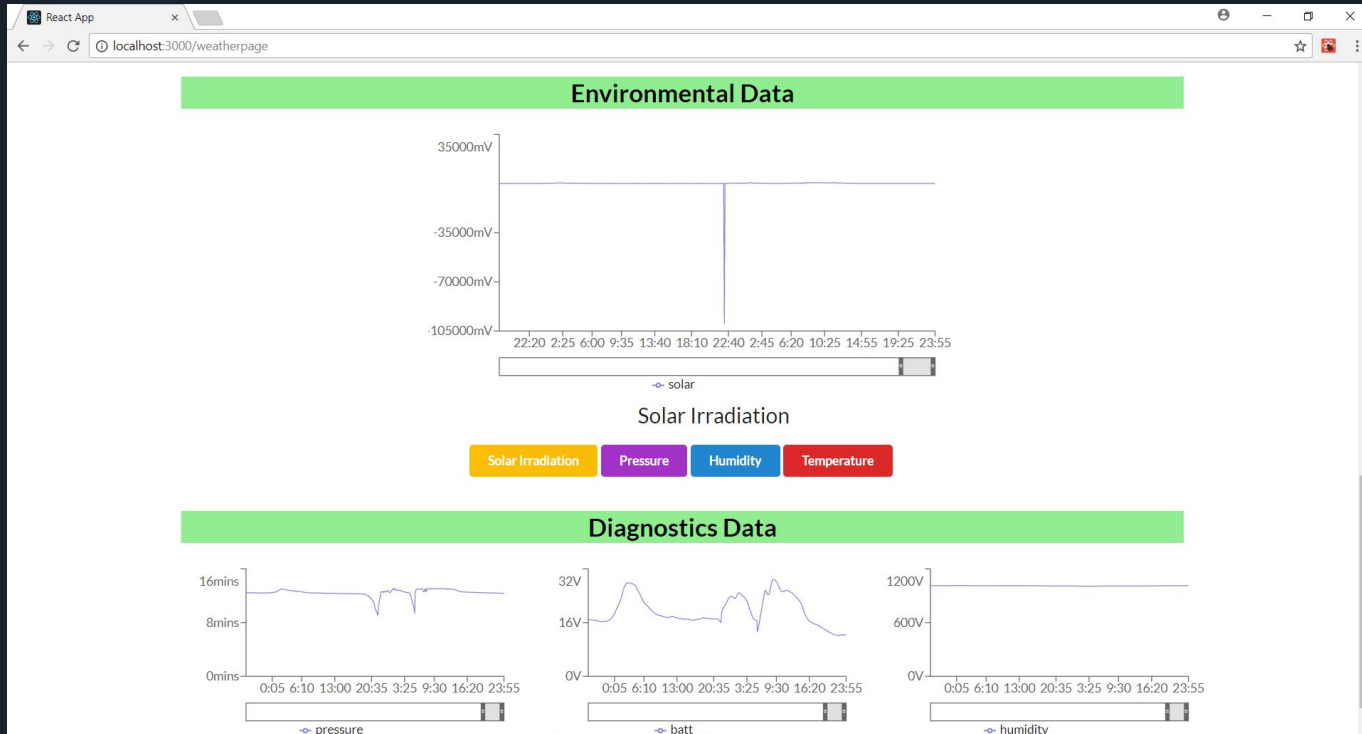
Mean of Recently Processed Data

Node #	Solar Irradiation	Pressure	Humidity	Temperature	Uptime	Battery Voltage	Panel Voltage
1							
2							
3							

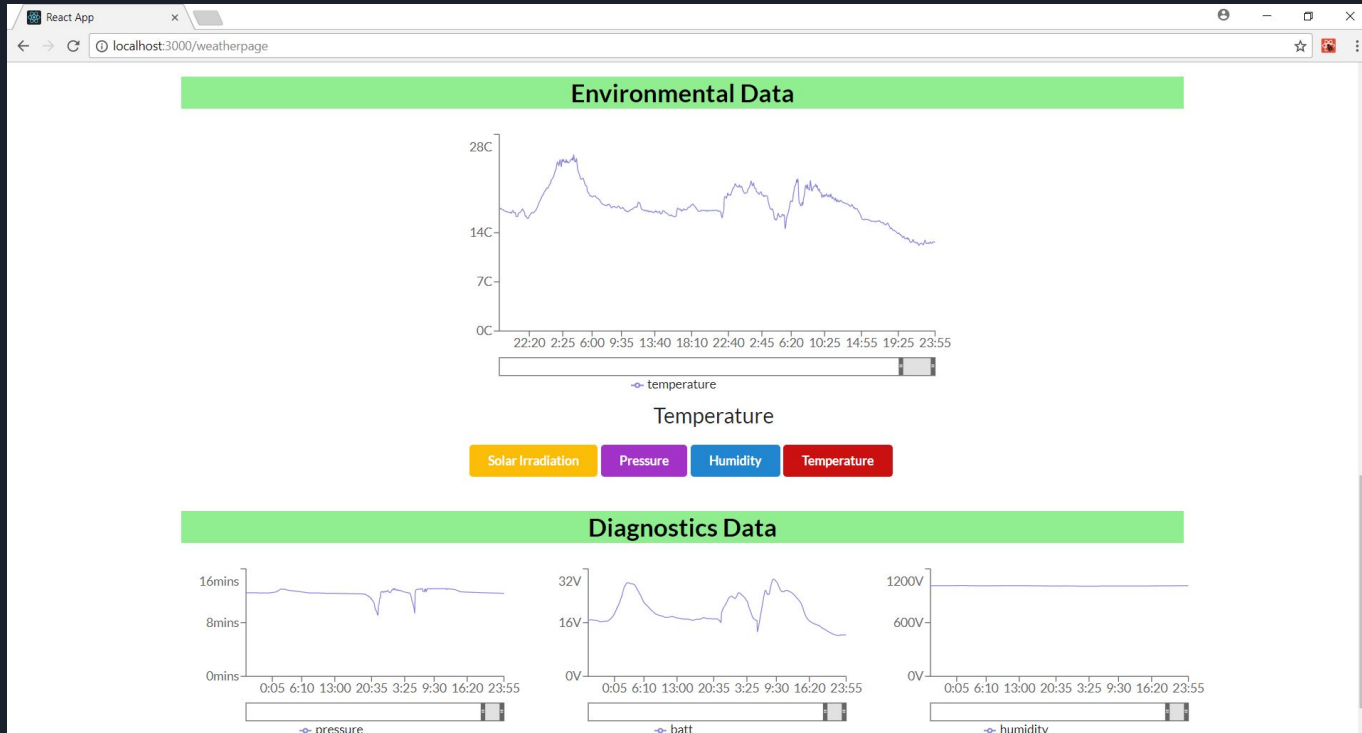
Standard Deviation of Recently Processed Data

Node #	Solar Irradiation	Pressure	Humidity	Temperature	Uptime	Battery Voltage	Panel Voltage
1							
2							
3							

Minimum Viable Product (MVP): Default Environmental Data Selected



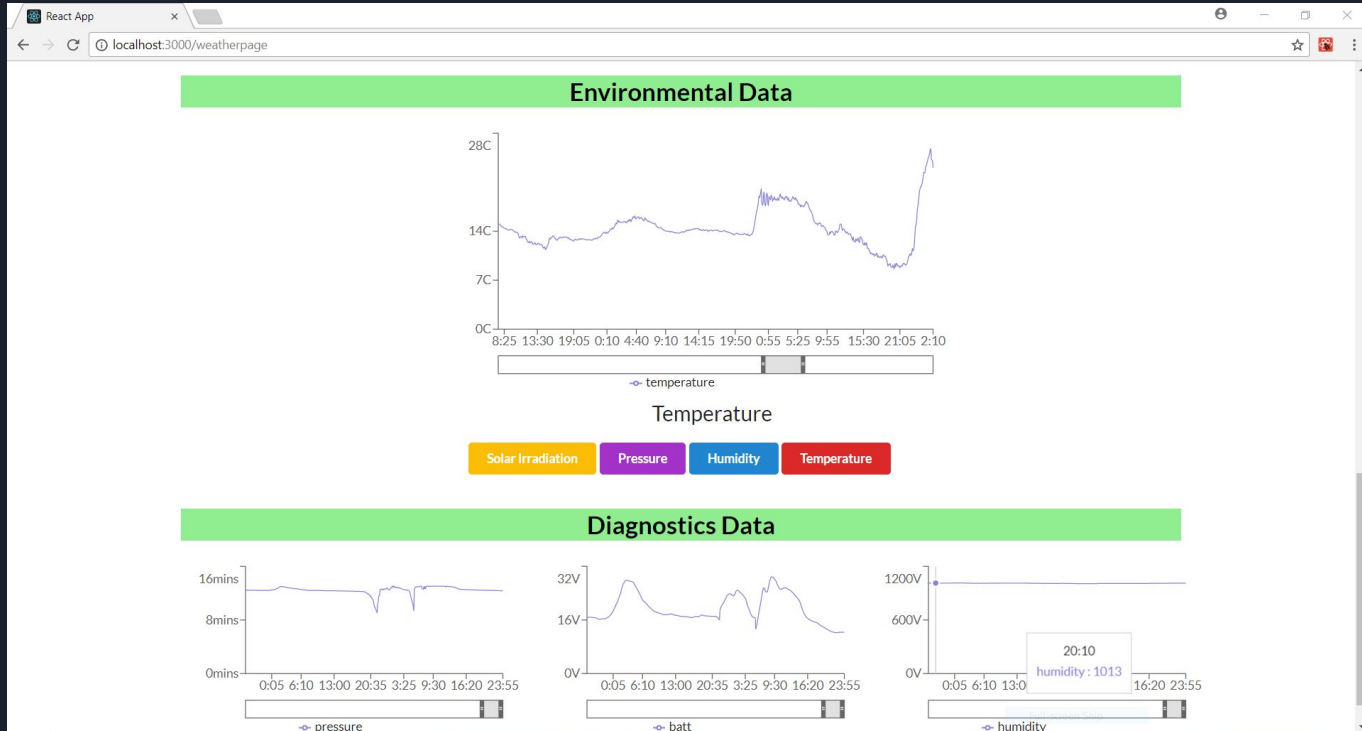
Minimum Viable Product (MVP): Temperature Button Selected



Minimum Viable Product (MVP): Time Scaled



Minimum Viable Product (MVP): Time Scaled and Shifted





Re-Evaluation of Designs

- **Additional components considered into design**
 - **Time scaling selection**
 - **Multiple node displayed**
 - **Statistical values**
- **Initial design**
 - **Lacked statistics table, multiple node selection, time scaling selection**
- **Second design**
 - **Incorporates considerations for desired features**
- **Final design**
 - **Style of data tables being displayed**
 - **Display of environmental data adopts second design's style (buttons and changing display)**

Code Reviews

- **Created issues for new additions to dashboard web application**
- **Reviewers provided feedback and comments on any changes required for the code**
- **With approval of at least two members, a merge can be completed to the master branch**
- **Effective for modular programming when using the same component for another web application page**

The screenshot displays a GitHub pull request interface. At the top, it shows 'Conversation 13', 'Commits 3', and 'Files changed 8'. The main content area shows a commit history with the following entries:

- gli285 commented 21 days ago - edited: "First working version of the environmental display, will be modified as more components of page is added"
- gli285 added some commits on Mar 21
 - Issue18: weatherbox page mockcomponent being worked on (7c8dac0)
 - created environmental display component for weatherbox page (5d572b0)
- gli285 self-assigned this 21 days ago
- gli285 requested review from chokevin and akirav 21 days ago
- gli285 reviewed 21 days ago

The code diff shows changes to `src/testdata/testdata.js`:

```
... @@ -7,3 +7,51 @@ export const EXAMPLE_DATA = [  
7 7 { name: 'Page F', uv: 2390, solar: 3800, amt: 2500 },  
8 8 { name: 'Page G', uv: 3490, solar: 4300, amt: 2100 },  
9 9 ];  
10 +
```

Comments on the diff include:

- gli285 21 days ago: "Forgot to remove as we have test data now"
- chokevin 17 days ago: "Make sure to remove this before merging"

On the right side, the 'Reviewers' section lists chokevin and kyle-chan with green checkmarks, and akirav with a yellow dot. The 'Assignees' section lists gli285. The 'Labels' section is empty. The 'Projects' section is empty. The 'Milestone' section is empty. The 'Notifications' section has an 'Unsubscribe' button and a note: "You're receiving notifications because you were assigned." At the bottom, it shows '3 participants' with icons for gli285, chokevin, and akirav.



Problems Encountered

- **State Changes**
 - **Observe and and debug state handler functions**
- **Modular Coding**
 - **Test with a general declaration of objects with properties**
- **Coding Convention**
 - **Observe and follow an “easy-to-follow” style**

Final Status of Project



Final Status of Project

Training
(Complete)

Design Documents
(Finalizing)

Dashboard Deployment and Development Weatherbox Page
(Finalizing)

Minimum Viable Product Weatherbox Page
(Finalizing)

Remaining Problems





Remaining Problems

- **Time Management (Resolving)**
 - **Deadlines and unforeseen events delayed pace in progression of the weatherbox page**
 - **Can finally focus after all major events have passed**
- **Integration of Collected Data**
 - **Currently working with test data**
 - **Node selection is currently not enabled**

Future Improvements



Future Improvements

- **Short-term goals**
 - **Finish debugging and improve handling of tables for statistical values**
- **Long-term goals**
 - **Add more options for statistical values**
 - **Presentation in selection of weatherboxes and nodes**
 - **More features for weatherboxes page**



Questions?

Thank you!





Sources

SCEL Logo: <https://avatars0.githubusercontent.com/u/7014873?s=200&v=4>

Microgrid:

<https://www.shareable.net/blog/microgrids-paving-the-way-for-distributed-energy>

Weatherboxes Page Mock-ups by Gordon Li

Weatherboxes Page Electronic Mock-ups by Gordon Li

Weatherboxes Page MVP Pictures by Gordon Li

Code Review by Gordon Li