SEADS Project

SEADS Team

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Project Sponsors

- Ali Adabi, UCSC
- Ian Gudger, UCSC

- Our Project focused on the use of data from Nonintrusive Load Monitors(NILM) (ex. SEADS Plugs, eGauge), used for monitoring personal energy usage.
- NILMs are installed in homes to record energy usage from main power sources.
- Based on usage patterns and frequencies, we can distinguish which energy signals correspond to specific appliances (heater, refrigerator, microwave, etc).
- We then visualize this data on the SEADS web page.

Initial Goals

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- Configure the existing code base to work with a PostgreSQL Database.
- Create a series of API calls to request and receive specific energy data.
- Analyze this data to detect specific events (appliances turning on/off, etc).
- Visualize this data on the web.

Achieved Goals

- The Project's Django server now interfaces with a PostgreSQL database containing the energy data.
- We developed an API that allows the user to return JSON data of energy usage and generation.
- We have implemented some basic event detection using python data analytics (classification of event proved to be a much bigger challenge than anticipated).
- We can view energy data graphically on the web using D3.js, including time series visualization and overall usage charts.

Project Challenges/Accomplishments

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Challenges

- Working with the existing code base.
- Developing our understanding of Django, PostgreSQL, and javascript.
- Creating a local development environment for each team member.
- Establishing a regular series of meetings each week.
- Underestimating the difficulty of some of our initial goals.

Accomplishments

- Successfully developed a working Django-powered website.
- Implemented event detection with the energy database.

Technologies Used

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- SEADS plugs / eGauge
- Django with PostgreS
- Python data Analytics
- Javascript's D3 Library

python™

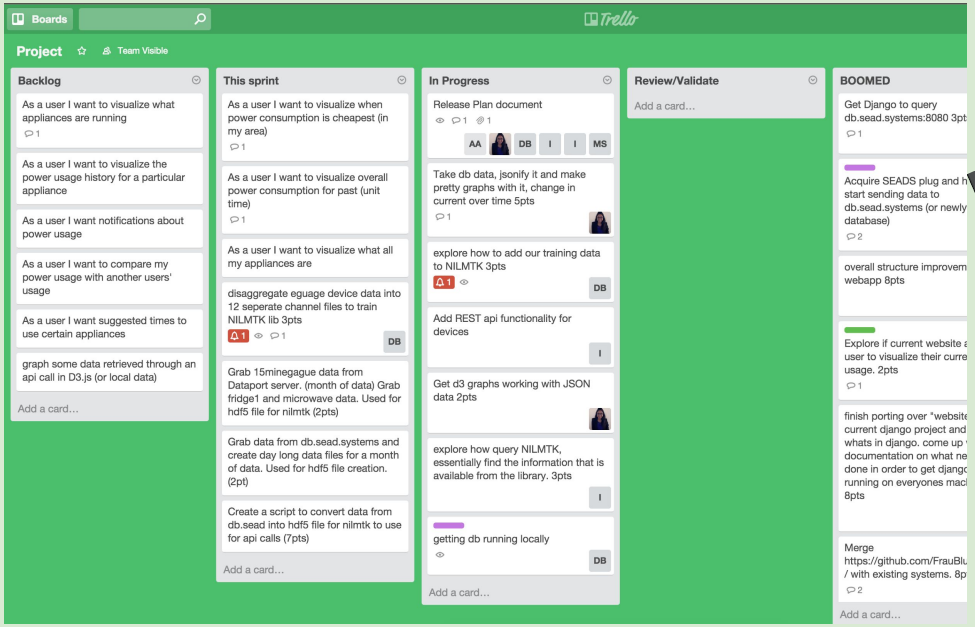
django

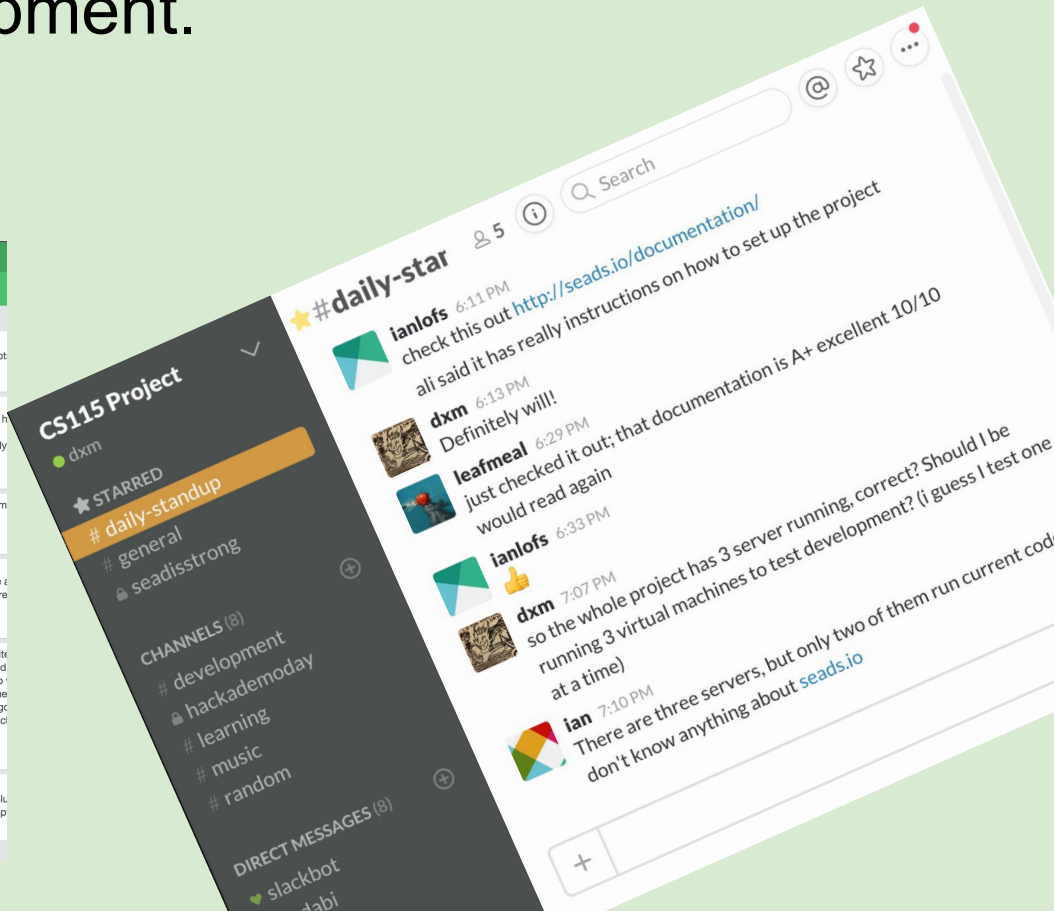
JS

D3

Project Management Techniques

- Slack, for team communication
- Trello, for a virtual scrum board (in addition to our physical scrum board)
- Github, for code development.





Things we (did not) Enjoy

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Enjoyed

- Working with new technologies like Database Systems and Django
- Continuing the work of previous groups to develop a more complete product.
- Having the support of our project sponsors Ali and Ian.

Did not Enjoy

- Having to make sense of an existing code base, some of which was well-documented while much of it was not.
- Scheduling enough time for this project, which proved impossible with our team members' other course loads.

Lessons Learned

What worked

- Using Github to keep code organized.
- Communication with Ali and Ian was important.

What Did Not Work

- We all came into this project with different skill levels, which made collaboration difficult.
- We were unable to set many realistic goals at the start of the quarter, which handicapped us later on.