# Lobo Scheduler: A UNM Open Data App

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## Introduction

UNM's IT department runs an annual mobile application contest that asks students to use data that they've provided and use it to develop a useful application that can be accessed on many platforms. For this contest I've developed Lobo Scheduler; an application that uses the UNM schedule of classes data and presents it in a mobile-first and interactive way.
Some of the goals of the project include:

- Visualize the schedule.
- Find classes easily.
- Analysis of schedule data.

## Motivation

A schedule visualization app is important to UNM because it:

1. Saves students and the university **time and money**.
2. Replaces legacy schedule web pages.
3. Provides a **data-centric framework** and an opportunity to expand functionality in other areas.
4. Improves UNM's reputation as a forward-thinking institution and helps **attract new students.**
5. Breaks the schedule into more easily digestible pieces for administrators looking to **improve the school's curriculum.**

## Conclusion

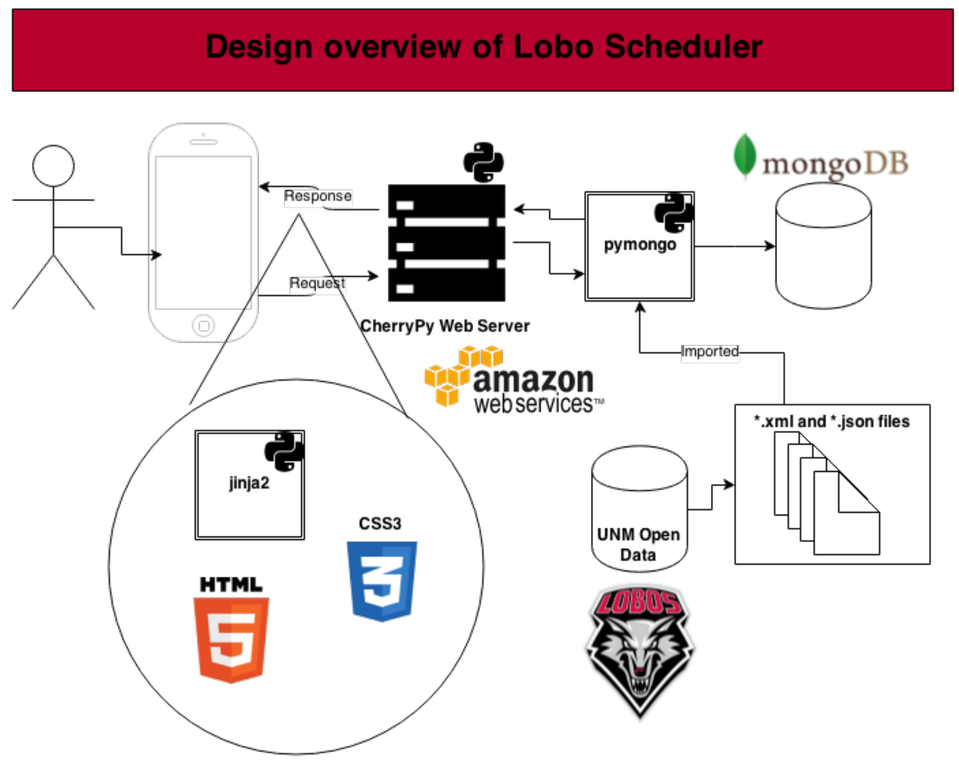
Having a data centric approach to application development modularizes the model from the view components of applications. Using a MongoDB NoSQL database with knowledge of UNM's schedule and other information makes it easy to write adaptable, responsive applications.
We have made some progress in visualizing the UNM schedule data and provided a mobile application to navigate and interact with the schedule. Finding new classes has never been easier with the search functionality.

## References

[1] UNM IT Department. Unm open data repository. http://opendata.unm.edu/, 2014.

[2] The CherryPy Team. Cherrypy: A minimalist python web framework, 2001-2014.

## Methods




A number of powerful web technologies widely used in production were used to create Lobo Scheduler. We have chosen to use a Python backend consisting of a CherryPy web server connected to a MongoDB NoSQL database. The UNM open data repository is accessed and imported to MongoDB via a number of custom scripts.
We have chosen to use a Windows 8 Metro UI CSS library to make a cross platform HTML5 web app. Data visualization is done through aggregated map-reduce queries to the database.

## Results

We have created a web application with a user interface as shown below.

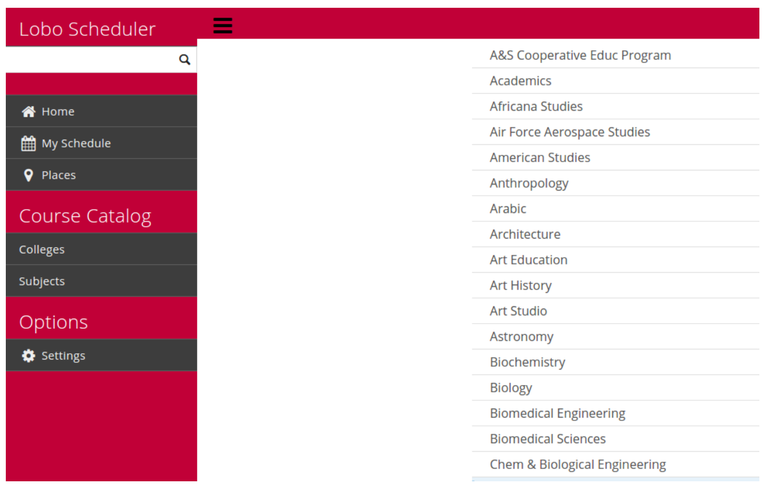



**Figure 1:** Sidebar navigation (left) and list of subjects (right).

Info visualization graphs were also created. In Figure 2, you can see a summary of the time periods in which classes are offered.

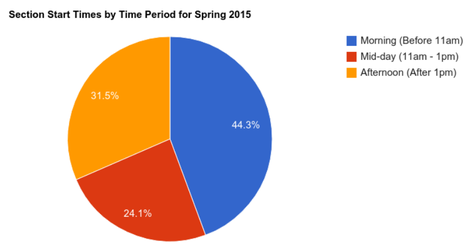



**Figure 2:** Summary of class starting times.

It is worth noting that using the XML to navigate the data was used initially, but this did not perform well and did not scale for search even with a small 12 megabyte file. MongoDB was useful for search, it provided a significant speedup over the XML version and also has built in query processing for text index fields. This was used for course titles and descriptions.

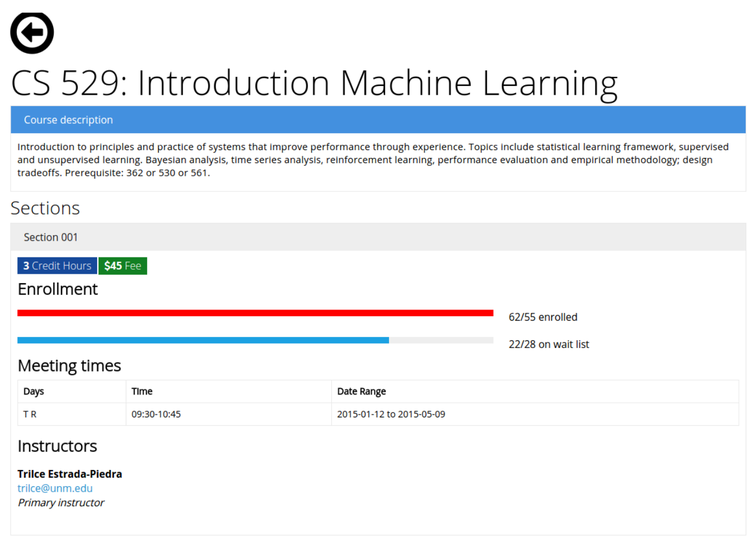



**Figure 3:** View of a single course.

## Future Work

Although we have shown an effective schedule visualization tool, there are areas for improvement. Incorporating more of UNM's other datasets into the app such as location and further interactive components are areas where the app could be expanded in the future. Machine learning could also be incorporated to learn about students using the app.