

# LOBO SCHEDULER: A UNM Open Data App

LUCAS NUNNO UNIVERSITY OF NEW MEXICO - COMPUTER SCIENCE DEPARTMENT

### 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.

### METHODS



### 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**.
- 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. 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 mapreduce queries to the database.

 $( \mathbf{ } )$ 

### RESULTS

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

Lobo Scheduler	
٩	A&S Cooperative Educ Program
	Academics
🖀 Home	Africana Studies
A My Schedule	Air Force Aerospace Studies
	American Studies
• Places	Anthropology
Course Catalog	Arabic
	Architecture
Colleges	Art Education
Subjects	Art History
Options Settings	Art Studio
	Astronomy
	Biochemistry
	Biology
	Biomedical Engineering
	Biomedical Sciences
	Chem & Biological Engineering

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

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.

### 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.

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



#### CS 529: Introduction Machine Learning

 Course description

 Introduction to principles and practice of systems that improve performance through experience. Topics include statistical learning framework, supervised and unsupervised learning. Bayesian analysis, time series analysis, reinforcement learning, performance evaluation and empirical methodology; design tradeoffs, Prerequisite: 362 or 530 or 561.

 Section S

 Section 001

 Section 201

 Date Renge

 Date Range

 Date Range

 Instructors

 Trice Estrada-Piedra

 trice Surdad-Piedra

 Trice Estrada-Piedra

 Primary instructor

**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 in-

teractive 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.