

**Student Projects Spring 2016**

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| **Student** | **Project Title** | **Project Description** | **Table Number** |
| Jorge Monardes | Machine Learning with Python: scikit-learn review | Demonstration of solving some classification problems using the Scikit Learn library in Python. Problems using Support Vector Machine (SVM), Boosting PAC Learning, and Markov Chain Monte Carlo methods will be covered. |  |
| Tianchan Dong | Digital Education in South Africa | Examines the impact of digital education in impoverished areas of South Africa. Is digital education the solution to combating lack of teachers and academic resources in developing nations? |  |
| Hao Wu  Guoshan Liu  Deyu Jiao | Duke Career Fair iOS Application | Collaborated with Career Service Center to develop an iPhone app for career fairs. The initial and main purpose of this app is to provide a fast, convenient and easily accessible way for students to get well-prepared and collect core information for the upcoming career fairs. The basic functions are implemented by providing a table list of employers in each career fair, containing short introductions of companies, available positions and booth locations. The list provides filter and search function to make job hunting more efficient. There are also a favorite list and a taking-note scene for recording. A booth map will be also provided with information tag on each booth location. In addition to the main functions, it will also provide a calendar reminder for career events, instant updates from social media and important news and resources from Career Service Center. |  |
| Henri Maxime Demoulin | Constraint driven recommendations for Apache Spark | Distributed Computing frameworks are becoming a preponderant part of datacenter's workloads; such frameworks include MapReduce, popularized by Apache Hadoop, and Apache Spark. Alongside this growth in popularity, it is a common habit to share resources among users to increase utilization, based on various allocation mechanism such as fairness, resource price, or naive FIFO policies. However, current schedulers assume that a user can determine a demand function, allowing to request a certain resource vector. We argue that this is not an easy task, which should not be delegated to users: inherent to the distributed and concurrent nature of the cited frameworks, monitoring and profiling are hard, high dimensional problems that block users from setting up a demand function they can use to define such vectors. Moreover, we argue that those vectors should be defined relative to a constraint that the user wants to meet (budget, energy consumption, cpu utilization, etc), which, with the current systems, requires domain specific expertise. In order to make a step toward a world where scientists can extract values efficiently from Big Data, without having to worry about the underlying computing frameworks, we propose a recommendation system for Apache Spark which allows a user to determine resource vectors for applications. Based on collaborative filtering, the system is constraint driven, gains in accuracy over time, and allows new applications to get recommendations after a couple of runs. |  |
| Raghav Kedia  Michael Lee  Jae Hun Ro  Ellen Yuan  Kei Yoshikoshi | Confucius | Confucius is the combination of Spotify music, Soundcloud, and breaking news in one package. The inspiration came from the fact that as university students, we don't have the time to constantly be looking for the best news sources. We also don’t have time to sit down and read the news diligently, especially when we are busy. Not only that, we found that with existing news applications, we were visually distracted while online, and were not able to just listen to the articles on these websites. We came up with an app that aggregates multiple news sources and translates their articles to audio, enabling users to take news with them on the go. With one tap, the user is able to listen to any article from playlists, trending articles of the day, and different genres from top news sources, in order to give the users the latest news on the go. Unlike other news app where users have to scroll through articles to read them, Confucius allows the user to LISTEN to an article. With our hands-free news app, we give users so much more than just news. We give users the freedom to be informed while on the go. |  |
| Yuhan Wu  Mingxuan Zha | UnionFind | The UnionFind app is a fast, simple and secure way to find your lost items in campus. SUBMIT LOST / FOUND  Easily and quickly submit your lost items without sign up. You can also submit ownerless items you found on campus. POTENTIAL FINDINGS The auto-pairing system will notify you when similar items are lost. INSTANT MESSAGE You can chat instantly with who found/lost the item.  MANAGE Sign in once with your college email and the app will keep you logged in. This is the most secure way to submit lost/findings and view your lost/findings. |  |
| Mingxuan Zha | PinMyCourse | Pinmycourse is a college platform for students to share course experience and evaluation, which would be helpful for students to make semester schedule. Different from "ratemyprofessor" and "course eval," we focus on ratings about specific courses and personal comments. SEARCH your interested course, and you will see all ratings and comments on it RATE the course you have taken, be objective to share your experience and feelings, so that other students can get the most accurate and helpful information. All ratings and comments are anonymous. Please follow the terms of use. SPEAK about questions in academics, or funny things in class. Only students enrolled in the course can join the discussion. ADD FRIENDS by linking to weibo (personal Blogs). Know the cool guys in your class BOOKMARK the valuable questions. Make your own review sheets for exams |  |
| Sivaneshwaran Loganathan  Tom Wu | InSwitch | InSwitch is a non-intrusive remotely operated light-switch flipper. It can easily be mounted onto existing light switches without touching the internal wiring of the room, so non-technical users can install InSwitch easily. The user can trigger flips of the switch remotely as long as he/she is connected to the internet. As a future extension, the switch would be able to recognize audio cues to turn off and on the lights. |  |
| Jeremy Schreck | Duke K-Ville Schedule Planner | I created an iPhone app that helps Duke students who are waiting in line for basketball games in "K-Ville" coordinate their schedules. Each group member enters the time slots during which they are available, and the app uses an algorithm I wrote to assign each group member time slots during which they must wait in line. |  |
| Qi Xu | Web Server in NodeJS | NodeJS is a great language for building web server in javascript. It was the first time I learned about NodeJS. I created a web server which can receive HTTP requests and send response in html format or JSON. Then I routed the server to make it able to deal with different urls. Recently, I rewrote the server in ExpressJS to make it easier dealing with routing. I became passionate about NodeJS and I would like to keep on learning and advancing in this field. |  |
| Canyon Dell'Omo  Uzoma Bailey Ayogu  Edwin Bodge  Sameer Pandhare  Morgan Ringel | Motus Operandi | Strauss 1 | Motus Operandi presents the Strauss 1 Individual Safety System. The system is comprised of hard hat-mounted sensory bands, which capture the UV exposure, local temperature, humidity, and physical activity of each worker. Designed for use in high-temperature job sites, the system calculates ideal break intervals in order to maximize worker health, efficiency, and productivity. The Strauss 1 System has the potential to save construction contractors around the world billions of dollars lost to project delays during high temperatures. |  |
| Emmanuel Shiferaw | Dig@IT: Archaeology in Virtual Reality | Dig@IT is an immersive archaeological virtual reality application built for the DiVE, a six-sided CAVE virtual environment, as well as for the Oculus Rift head- mounted display. The application was built using the Unity3D game engine and MiddleVR SDK. Containing 3D models of an archaeological dig-site generated at Catalhoyuk in Eastern Anatolia, Turkey, Dig@IT consists of a 3D user interface for navigating around and interacting with the site, and viewing information related to artifacts and more. |  |
| Wenting Hu | Gamification App | Configured tasks in RPG game with subtasks and quests, enabling users see progress and reach goals, as well as manage time during simultaneous game tasks. Built local data storage with sandbox and online data storage with Parse for user information. Integrated Facebook API for users to login to interact with friends. |  |
| David Zhou  Daniel McKee  Michael Daou | SLogo IDE: A Program to Teach Programming | An integrated development environment that allows the user to write programs in a simplified form of the Logo programming language (simple Logo, or "SLogo"). |  |
| Thomas Klebanoff | Coding a Workflow Enhancing Plugin for Music Production with JUCE in C++ | This plugin addresses several workflow issues I have encountered while producing electronic music. One of the biggest challenges involved in this field is effective signal routing. The best producers in the world have figured out how to cleanly split up an audio signal and process it in different ways before compressing it back together. This plugin lets producers of all skill levels do this more quickly and efficiently, meaning less time spent outside of the creative state of flow. More information can be found here: http://klebs.space/router This project was presented at the first annual JUCE Summit in London, November 2015 |  |