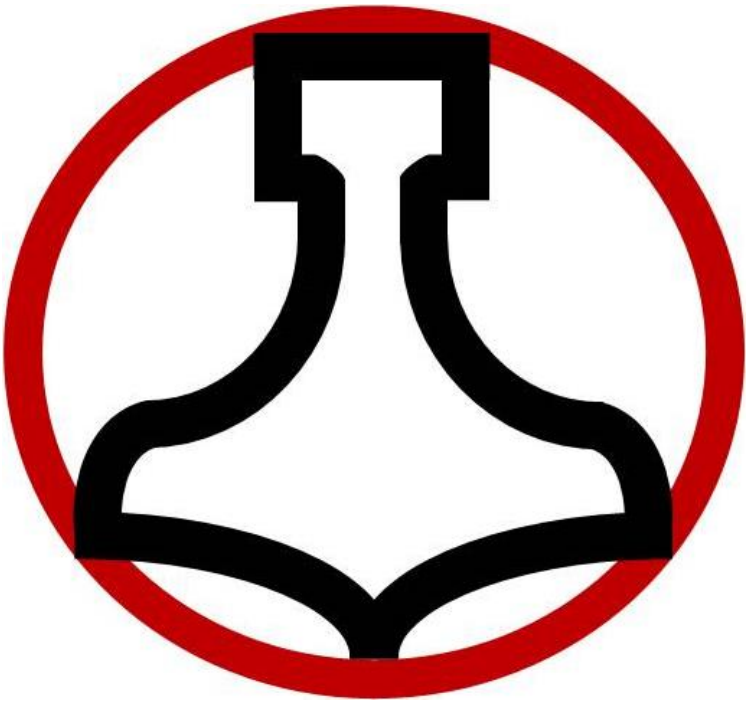
PENNSTATE

Department of Computer Science

Strength Hub
Statement of Work Report
&
DSR

November 10th, 2015



Alex Nagl
Brandon Vergara
Matt Dixon
Matt Fink

☑ Intellectual Property Rights Agreement Applies

Executive Summary

StrengthHub is a digital platform with an intuitive interface, both smartphone based and laptop based, to enhance training and programming techniques of strength and barbell athletes. The application that we are designing not only provides a convenient method to create, log and track progress, it also connects coaches and athletes to advance strength and barbell sports. This document summarizes the StrengthHub's goal, design choices, and the schedule that we have put in place for ourselves.

StrengthHub's goal is to create an application for powerlifters that will replace any other methods that are currently used by powerlifters to keep track of their workouts. If this goal is met within the 15 week time table, then StrengthHub will begin development of a website that will be able to connect athletes with trainers to further enhance their workout routines.

The current budget for this project is $1000. Currently, the team is having some difficulties finding ways to spend this budget. At the moment the budget is only being used to pay for google apps for work. This comes out to cost about $120, which is a very small sliver of what needs to be spent by the end of the semester.

Lastly, the communication between StrengthHub and the development team will be upheld with weekly meetings via Skype conference calls. During these meetings both the business team and technical team will discuss what tasks have been accomplished and whether or not there are any setbacks to deal with.

In terms of creating the StrengthHub platform, it will be broken down into three separate parts. First and formost, the iphone application will be created with swift in xcode. It will be communicating with parse.com which is where we will be storing our databases that we will need in the app. Parse is the second part that we will be focusing on. Parse will contain the user's information such as email, password, and current stats and workouts in progress. The last part of the key to the StrengthHub platform is the website. The website will allow users to see more information about the company and give the user the ability to upload custom workouts using an excel template. In the future StrengthHub will feature the ability to connect athletes to coaches from anywhere in the world.

Table of Contents

1.0 Introduction

StrengthHub is a startup company that has recently entered the market for fitness application development. Our goal here at StrengthHub is to provide a mobile application that is designed specifically with powerlifters in mind.

1.1 Initial Problem Statement

The general fitness community is large. However within that general market segment there are small communities of people with very specific goals to improve strength performance by specific measurable amounts. This includes powerlifters, Olympic lifters, strongmen, and CrossFit participants. A uniting characteristic is these athletes set specific measurable goals and track progress on a daily basis by recording workouts and results. Thorough research and interviews substantiated that there is no good way to create strength programs and log performance and results using and laptop or smartphone.

Additionally there is a set of people who use virtual coaching to reach peak performance. The athlete will send the coach money via popular methods such as Venmo, PayPal, or even mail a check. The coach will email a workout plan to the athlete. The athlete will record of their performance as well as write down results of the workout. The athlete will send this to the coach and the coach will update the program.

In summary, there is no successful digital workout log or platform for coach and athlete relationships.

1.2 Objectives

Our short term goals for this project will be directed toward the iPhone market for the majority of the weeks to come. By the end of the fifteen weeks that was allotted to us, we plan to at least have a fully functioning iPhone application for powerlifters. By narrowing our scope of the project, we are all able to focus on making a quality application. However, if we are able to get ahead of schedule, then we will get an android app in development that will contain most of the features in the iPhone app. It is more than unlikely that we will be able to get a website done as well, so we have all decided that, for the time being, the website will be put aside.

2.0 Customer Needs Assessment

2.1 Gathering Customer Input

Initial customer input has been gathered by two primary methods: prior knowledge from the StrengthHub founders and a preliminary meeting with two members of the Penn State Powerlifting team.

StrengthHub founders Andrew and Brandon both have years of experience with strength training, which gives them an understanding of the needs of strength athletes as well as the organization, market, and culture of the strength training community. Their input and initial concepts were strongly considered when designing mockups for the application, and their athletic experience formed the basis for the beginning of the design process.

Additionally, Andrew and our team organized a meeting with two members of the PSU Powerlifting team, Renee and Erik, on Sept. 11 to begin acquiring an understanding of the potential value of a strength training app. Both athletes were able to describe and clarify a variety of aspects of their strength training routines, and also answered a series of questions designed to gather input and opinions regarding the design and implementation of the app and associated web and coaching services.

In addition to the increased understanding of the needs of the powerlifting market, this meeting also established a point-of-contact for StrengthHub to gather input from strength athletes regarding potential concepts and app designs. As the design process progresses, iterative stages and changes in the design can be demonstrated to these athletes and their team for rapid feedback.

2.2 Weighting of Customer Needs

Below is a simple Pairwise chart that has four criterion that we will be using to determine the importance of future tasks to come. For the least important we have cost. Since we have a budget of $1000 and are having a difficult time finding a way to spend the money, we have decided that this project is not necessarily limited by its cost. This at least holds true for the technical team.

The efficiency of the application, is what we will all be focusing on. The software we are creating needs to outdo the standard paper and pencil methods of writing down personal records of exercises done during a workout. In a sense ease of use could also be linked with efficiency, since the customer needs the application to be extremely easy to use if it is to replace the current standards.

Table 1. AHP Pairwise Comparison Chart to Determine Weighting for Main Objective Categories

	Ease of Use	Ease of Mfg	Cost	Eff.	Total
Ease of Use	1.00	1.00	0.33	1.00	3.33
Ease of Mfg	1.00	1.00	0.50	.50	3.00
Cost	0.33	0.33	1.00	.20	1.83
Efficient	1.00	1.00	1.00	1.00	4.00

Table 2. Weighted Hierarchal Customer Needs List

1. Ease of Use (3.33)
   - 2.1 Simple one button presses to record data
   - 2.2 Easy to add workouts
   - 2.3 simple transitions to data and workouts
   - **C.1 Work with IOS features**
2. Ease of Manufacturing (3.00)
   - 3.1 Swift for coding
   - 3.2 Parse for the backend of the application
   - **C.2 Need Macs for programming**
   - **C.3 Must learn many things (Languages, Apple App Dev, Etc) before programming begins**
4. Cost (1.83)

4.1 Most software is already owned
4.2 Services used are cheap

5. Efficient (4.00)
   5.1 Keep track of reps and sets
   5.2 Allow for graphical data
   5.3 Video recording capabilities

C. 4 Maximum Budget is $1000

3.0 External Search

Since StrengthHub is developing a means for powerlifters to track their workouts, there will be no patents that would affect our design choices and/or the functionality of our applications. Fitness cannot have a patent associated with it and since we will being creating an ios application, we are able to take many liberties with the functionality of our application as long as we do not give any medical advice.

3.1 Existing Products

StrengthHub's main competition in the department of fitness applications is Gain Fitness. Gain Fitness does most of the functions that StrengthHub hopes to accomplish. They have a website where the user can connect with a physical trainer, an exercise tracker, and detailed instructions on how to do the exercises.

4.0 Engineering Specifications

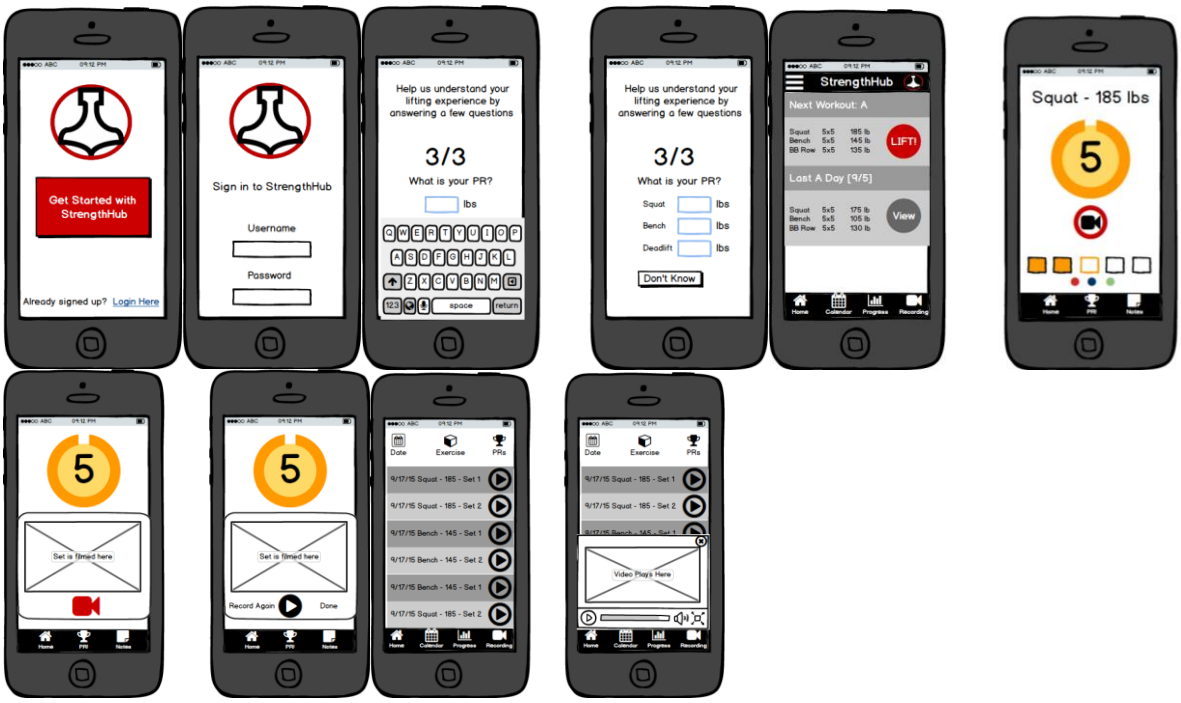
4.1 Establishing Target Specifications

This app being created is being designed by powerlifters, for powerlifters. With that in mind, the app is meant to be simple and intuitive to hit the powerlifting market. From there, we can expand the market to target other branches such as general lifting.

5.0 Concept Generation

5.1 Concept Generation

The mockup/wireframing tool Balsamiq was used to rapidly prototype aspects of the appearance and functionality of the application.



5.2 Concept Selection

Our design for this app is fairly simple. The user will be asked to sign in with their username and password. If they are a new user, then they will be asked some questions that will determine their fitness expertise. From there, they will be able to continue their workout or start a new one. Workouts will alternate days and will give an overview of what exercises are to be done that day.

Right from the beginning, we knew we didn't want the user to mess with typing in number on their phone to track their workout. That's why we decided to implement a "knob" that will allow for quick picking and choosing of number of reps done in a set and weight chosen for their lift. The idea of having a knob complements this idea of simplicity that we are going for. We want all of our function to be just one click away no matter "where" the user is in the app. Once again, we favor the idea of simplicity and ease of use because that is what our customers will be looking for.

6.0 Special Topics

6.1 Budget and Vendor Purchase Information

- $120 Google apps for work ($5/person per month)
- $100 Apple Developer account
    - 30 percent cut of sales
- $21 Github account $7/per month
- $258 Ipod touch
- $474.88 Apple Watch

Total: $973.88

6.2 Project Management

Below is a Gantt chart that demonstrates the general schedule that StrengthHub plans to stick to in the weeks to come. The actually programming cannot take place until the storyboard was set up. We needed to understand what the application would look like and what sort of function we were going to add.

	Weeks							
Milestones	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15
Coming soon webpage								
Learn Swift and Parse								
Set up Google apps for work								
Storyboard								
Backend of app								
Program app								
Present project								

6.3 Risk Plan and Safety

There are not too many risks that we foresee happening with this project. As of right now all of the major things that could have gone wrong, have passed and all that remains is to finally start programming.

Table 3. Risk Plan

Risk	Level	Actions to Minimize	Fall Back Strategy
Change in customer specification	Moderate	-Involve customer in process of refining specifications -Work with customer to estimate time and cost penalties of changes	-Add time to schedule for that particular task -Additional budget required
Schedule delays	High	-Constantly track project progress -Look for ways to accelerate activities -Identify critical path and tasks	-Build in safety time -Re-allocate resources or staff
Product does not function as predicted	Low	-Test early and often -Be aware of risks of new technology	-Alternative design
Customer not satisfied	Moderate	-Understand the customer's needs (voiced and non-voiced)	-Discuss ways to fix the problem

6.4 Communication and Coordination with Sponsor

Meetings with the sponsor are held every Thursday night to discuss project status on both ends. Occasionally our sponsors will bring with them guest speakers who give insight on useful topics related to both the technical side, and the business side of work.

An in-person meeting with Andrew from StrengthHub was also held on Sept. 12 in order to begin designing concepts and mockups for the functionality and appearance of the mobile application.

7.0 Detailed Design

7.1 Process Plan

As stated in the Executive Summary, the StrengthHub platform will be broken up into three different sections. The same will be done for the process plan.

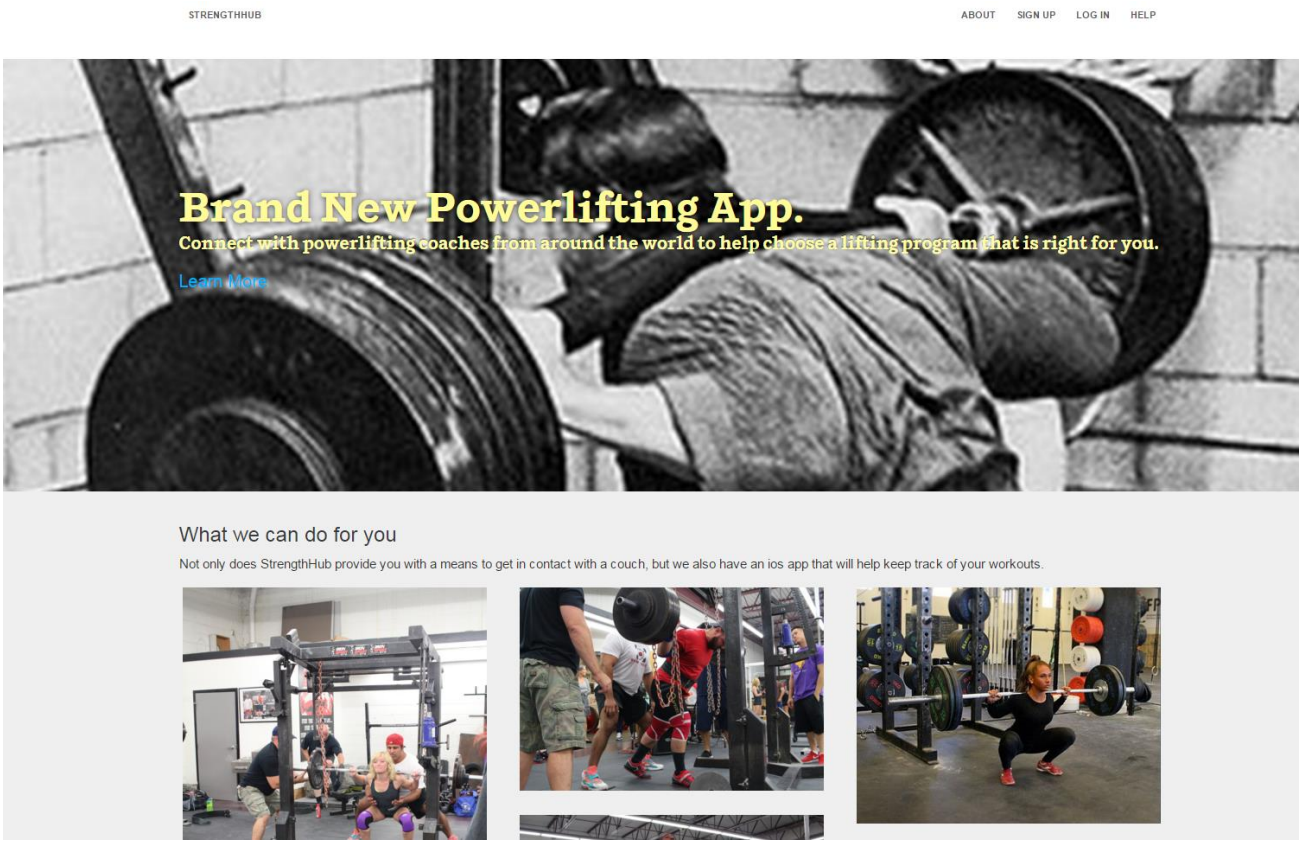
Website:

Step	Name	Description
1	Sign up to AWS (Amazon Web Service)	Create domain name and link to google apps for work
2	Utilize S3 and Route 53 in AWS	S3 is for creating a static website and Route 53 allows for use of the domain name

3	Set up an account for Parse	This is what we used as our data base for our application
4	Code in HTML/Javascript/CSS	Used these languages to create the main page for the website
5	Link website with Parse	This will allow for user information to be stored and additional info about workouts to be stored and accessed on the website for users
6	Additional Pages for Website	Continues to add additional functionality to the website such as about page, contact info, etc

Website Functionality

The website will be split into several different pages that have different purposes. The main page will contain several links that will jump to the different pages. As of now there will be an about page, Signup, login, and custom workout pages that will be added. The images below show the overall format that the website has.



The links to the other website's pages will be located at the top of the page. The website can be reached at StrengthHub.net

Iphone / Apple Watch:

Step	Name	Description
1	Obtain a Mac	A MacBook is necessary for coding the StrengthHub application.
2	Download xcode	IDE used for apple products. Uses Swift as main coding language.
3	Code in Swift	The language that apple products use
4	Utilize assets in code	This consists of dials and certain images that will be added and used in the app
5	Use test device to test solution	Use respective devices for testing.

Database:

Step	Name	Description
1	Create account for Parse	Will be where all the databases are stored for StrengthHub
2*	User database	This class is provided by parse which is what will be used to house all the data needed by the user.

*The spreadsheet below will demonstrate how the databases will be linked together and be used in the application

USER					Workout	(Class)						
Name	Type	Example		Optional	Name	Type	Example	Example		Programs		
Username	String	Jim			Exercise	String	Bench	Squat		Name	Type	Date	Example
Age	Int	13			#Sets	Int	5	2		3x5			
Question 1					#Reps	Int	5	10		5x5			
Question 2					Program	String	5x5	Custom A		5x3x1			
Question 3					Weight (lbs)	Int	100	110		...			
Email	String	aa@gmai.com			PR	Boolean	T	F		Below for Premium Users			
Password	**	a380c1hd810	(Encrypted)		Video	Boolean	T	F		Custom			
Body Weight	int	160 lbs			Succeed/Fail	Boolean	T	F		...			
History	LOG												
					LOG			DATE		Exercises	(Library)		

Workout #	Type
10/22/2015	DATE
10/23/2015	DATE
10/24/2015	DATE
...	Workout
12/2/2015	Workout
...	Workout

Workout #	Type
Work 1	Workout
Work 2	Workout
Work 3	Workout
...	

Name	Type	Info (wiki)
Bench	String	String
Squat	String	...
Dead	String	...
Shoulder	String	...
...	String	...
Custom	String	...
...	String	...

7.2 Analysis

StrengthHub's design focuses on the use of our Parse database. Parse is the foundation that this app will be built upon. Once the database is created, the rest of the programming will come with no hiccups. However, there are some difficulties that Amazon Web Services. This problems are minuet and will not hinder the overall outcome of the project. AWS has a learning curve that may impede those who are new to web design, but luckily there are plenty of tutorials which makes this a moot point. Never the less it is still worth noting.

7.3 Component and Component Selection Process

Web Components:

- **Parse**: Easy to use and learn. Parse is free up until a certain amount of hits per second is reached.
- **AWS**: Difficult to learn at first, but many tutorials that help a lot. Plus there is also a lot of services that can be utilized in the future.
- **HTML**/**CSS**/**Javascript**: HTML is used for the base website, CSS is used to take the HTML output and format it to look a bit more presentable, Lastly Javascript allows for added functionality such as scripts.

Iphone/ Watch App:

- **Test Products:** (watch and ipod)
- **Xcode:** IDE for apple products
- **Swift:** Code that the IDE uses
- **GitHub:** will be used for the programmers to collaborate

Apple forces you to use both of these so there are no additional choices for us to choose from

Database:

- **Parse:** the backend of the app. It'll handle all of the user info and login information. StrengthHub workouts will also be stored in parse for the website and app to view and edit.

7.5 Test Procedure

The way that StrengthHub will test these applications is by using Xcode. This will allow the programmers to see any syntax errors and it allows to for the programmers to see the build of the application. The website will be tested through AWS. The HTML index file will be uploaded to AWS, which then will create the website for viewing.

Appendix A: Resumes

Matt Fink's Resume

Matthew Fink

132 Hedgerow Dr., Souderton PA 18964
Home: (215) 723-8225 **Cell:** (215) 817-8346
mattfink11@gmail.com

Objective

To obtain a summer internship that will challenge my programming skills and build upon my current knowledge base while allowing me to utilize my strong interpersonal skills and ambition to assist my employer.

Education

Pennsylvania State University **Expected Graduation year:** 2016
University Park, PA

Bachelor of Science: Computer Science **GPA:** 3.62

Current Courses

- Systems Programming – Created a C program for a Jumbotron display of information
- Computer Organization and Design
- Game Development – Project leader for a JavaScript game (ongoing)

Core Qualifications

- Cooperative team member
- Computer proficient
- Excellent analytical skills
- Quick learner
- Collaborative team member
- Attention to detail

Experience and Technical Skills

- C/C++ Programming
- Debugging
- Java Programming
- Design Patterns
- OOP
- Android App development

Work History

Peter Becker community August 2009 to August 2012
Harleysville, PA

Dietary aide

- Managed the Cafe for independent living community members
- Communicated with other staff members in order to provide the best service to the community members
- Organized Cafe services which included opening and closing responsibilities

Personal Interests

- Taekwon Do
  - Held a leadership position on the Demonstration team (2003-2009): Included demonstrations within the community and training future students
  - Third degree black belt
- Building computers

Clubs and Competitions

- Penn State ACM (Association of Computing Machinery)
- HackPSU (2015 Competition)

Alex Nagl's Resume

Alexander H. Nagl

AlexanderHNagl@gmail.com • (610) 710-1449

School:
10 Vairo Blvd, APT 25C
State College, PA 16803

Home:
433 Upper Weadley Rd
Strafford, PA 19087

EXPERIENCE

DISNEY ABC TELEVISION GROUP, Burbank, CA & Remotely
Associate iOS Software Engineer, January 2014 – Present

- Partake in the creation, maintenance, and design of a consumer facing application that uses in app purchases (Disney Jr Appisodes, tinyurl.com/ng6uy7d)
- Participate in multiple strategical business and development meetings
- Architect, update, and develop an internal game engine written in Objective-C using the Cocos2d framework
- Perform code reviews to ensure high quality software

APPLIED RESEARCH LABORATORY, State College, PA
Intern, August 2013 – December 2013

- Participated on a DARPA funded project (iFab, tinyurl.com/q32d4kz)
- Created and developed an iOS application using Apple's frameworks
- Integrated secure information and databases into the application

PENNSYLVANIA STATE UNIVERSITY, Reading, PA
Research Assistant – Engineering Department, September 2011 - June 2013

- Published a paper at an international engineering conference that was presented June 2013 (tinyurl.com/lkszk56)
- Programmed and developed an iOS applications that employ the gyroscope and accelerometer sensors on iOS devices to simulate and generate experimental data for use in engineering classes
- Conducted tests to determine the accuracy of the measurements made by the hardware used in such experiments

KENEXA, INC., Wayne, PA
Intern – Information Technology Department, February 2011 - August 2011

- Prepared desktop and laptop computers for use by employees with Altiris imaging software
- Managed and organized technology inventory and oversaw recycling and reuse of electronic equipment
- Provided regular technological support to company personnel
- Designed, constructed and maintained a server room for use by Kenexa software developers

AWARDS AND SCHOLARSHIPS

APPLE'S WWDC 2015 Scholarship Recipient, June 2015 (tinyurl.com/7jh2h8w)

JP Morgan Code For Good Delaware Challenge Winner, November 2013
(tinyurl.com/k8ajft5)

Matt Dixon's Resume

Matthew M. Dixon

463 E. Beaver Ave., Apt. 302
State College, PA 16801
412-770-7127
myd5275@psu.edu

Education

The Pennsylvania State University – University Park, PA
Bachelor of Science, Computer Science
Expected Graduation – May 2016
GPA – 3.75, **Dean's List** – All semesters

Relevant Coursework

Object-Oriented Programming
Introduction to Systems Programming
Operating Systems Design
Computer Organization and Design
Communication Networks
Data Structures and Algorithms

Work Experience

Lutron Electronics Company, Inc. – Coopersburg, PA — May 2015 – August 2015
Software Engineering Intern
Prototyped, designed, and implemented enhancements to a desktop design tool utilized by internal and external users in the process of designing lighting control solutions.

- Collaborated with internal users and software engineers to conceptualize and design product enhancements
- Implemented extensive and constructive user experience improvements utilizing Windows Presentation Foundation and SQL Server in an object-oriented setting
- Engaged in code reviews and testing as part of an Agile process to ensure quality software was delivered on a consistent basis

Express Factory Outlets – Washington, PA — July 2014 – August 2014
Sales Associate

- Assisted 100 or more customers per shift with merchandise location and sizing
- Provided customers with an efficient checkout experience, handling $2,000 or more per day
- Promoted and enrolled customers in store rewards credit card

Activities

Penn State IFC/Panhellenic Dance Marathon — October 2013 – Present
Boulevard – Community Service Organization

- Collaborated with fellow organization members to raise approximately seventy-five thousand dollars during 2014-2015
- Attended weekly meetings and participated in canning fundraising trip
- Supported organization's dancers by attending dance marathon

Penn State Association for Computing Machinery — August 2012 – Present

- Participated in weekly organization meetings

Academic Projects

- Created a virtual multi-screen video display driver using C in a Linux environment
- Designed a basic MIPS 32-bit CPU using procedural Verilog
- Implemented process scheduling and memory allocation systems algorithms in C

Brandon Vergara's Resume

Brandon H. Vergara

67 Stone Run Drive, Mechanicsburg, PA 17050
(717) 795-8021
bhv5007@psu.edu

EDUCATION:

The Pennsylvania State University – University Park, PA — Anticipated Graduation – May 2016
Bachelor of Science in *Computer Science*
Minor in *Mathematics*

RELEVANT COURSEWORK:

Programming languages: C, C++, Java, Assembly (MIPS ISA), Scheme
Software: Linux, Windows OS, Microsoft Office

PROFESSIONAL EXPERIENCE:

Systems Engineering Intern, Gannet Fleming Inc. — Summer 2014 and 2015
Camp Hill, PA
Global infrastructure firm that provides planning, design, technology, and construction management services for a diverse range of markets and disciplines.

- Used programmable logic controllers to assist in small projects
- Managed legacy hardware and software

Capstone Project, Strength Hub — Fall 2015 - Present
University Park, PA
Start-up which aims to connect strength athletes with strength coaches in a convenient and easy-to-use manner.

- Designing and developing an IOS mobile app using Swift, as well as other software tools
- Creating a back-end database for use in conjunction with the app

ADDITIONAL EXPERIENCE:

Martial Arts Instructor, West Shore Academy of Martial Arts — May 2007 – August 2012
Camp Hill, PA
Martial arts school teaching Jung Sim Do, self-defense, and cardio kickboxing.

- Provided expert instruction in martial arts and self-defense to the Academy's young student base
- Served as Team Coach of the Academy's junior demonstration team
- Represented as Team Captain of Academy's competition team

Vice President, Penn State Dance Dance Maniacs — August 2014 – Present
University Park, PA
A club that is devoted to rhythm games, particularly ones that involve exercise such as Dance Dance Revolution.

- Organized group events
- Managed club funds

PROFESSIONAL MEMBERSHIPS:

- National Honors Society — 2010 – 2012
- Penn State ACM — 2014 – Present
- Penn State Game Design Club — 2014 – Present

COMPETITIONS AND EVENTS:

- HackPSU
- CodePSU
- Penn State Game Jam
- Microsoft College Code Competition