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CAREE – Faulkner University

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**Abstract**

From January 2015 to December 2015 I was an intern for CAREE at Faulkner University. I used various programming languages in order to visualize data provided to me. This visualization is achieved via Highcharts. I also attended a conference in Savannah, Georgia, where I presented work I had done for the internship.

**Internship Report**

During the last two semesters of my college career, I interned with CAREE at Faulkner University. My internship with CAREE lasted from December 2014 to December 2015. CAREE’s mission is to maintain and provide data to better both the administration and student body of Faulkner University. With my time at CAREE, my focus was to learn how to efficiently use Highcharts and effectively provide visualization of data provided to me. The ultimate goal of the internship was to leave them with software that allowed them to visualize their data and post on Faulkner University’s website. This software would make it much easier for them to share their data to the appropriate individuals or groups that wanted it. I learned and improved upon many skills including programming languages, interaction with a supervisor, and working in an office environment.

I met with Dr. Brenda Turner in December of 2014 to go over what the internship position would entail. One of my first tasks was to familiarize myself with Highcharts, a JavaScript library that provides a programmer a means by which to visualize data. Another task given to me was to grow more comfortable with JavaScript. A meeting was scheduled for me to be introduced to the office environment in January.

In January of 2015, I visited the office to be shown around. It would not be until February that I would actually be working on the project in the office rather than at home. After much research, I successfully created my first chart with dummy data. Once I was comfortable with working with the smaller scale dummy data, I was given real, larger scale, institutional data. This data was essentially identical to the dummy data, therefore making it an easy transition.

With access to the larger scale, institutional data, my task became creating charts that could actually be useful to CAREE. I was given examples of universities that used Highcharts to display institutional data. With these examples, I began attempting to recreate charts that Florida State University had on their website. Although I had access to institutional data, I did not always have the exact data I needed.

In order to try to recreate the charts, I coordinated with Alison Simonton in the office to get the data I needed. Mrs. Simonton is the one responsible with organizing the data into excel files. With the excel files she created or had from her predecessor, I created CSV files in order for the code I was using to interact with the data I was provided. With these CSV files, I created many charts that I displayed at the end of each of the months of February, March, and April. During the meetings in February and March, I showed off charts and also discussed with Mrs. Simonton and Dr. Turner what exactly was wanted to be done to advance the project. At the end of April, we three had a meeting with Dr. Cindy Walker, Professor Susan Hammond, and then Vice President for Academic Affairs Dr Marci Johns. This meeting had the intention of showing off what we had accomplished thus far in hopes not only to generate interest in the project, but potentially garner more funding. It was after this meeting that I spoke with Professor Hammond, and she recommended using XML instead of the then current approach of hard-coding.

At this time, Dr, Turner had already submitted a proposal to SAIR (Southern Association for Institutional Research) to present what we were able to accomplish through an internship. We were eventually accepted and began preparations to present in Savannah, Georgia at the conference. The introduction of XML meant that the coding aspect of the project had to radically change and be presentable by the time of the conference. I personally had very little experience with XML; however, I eventually grasped the concepts of XML and began learning how to integrate it into the project. Once I realized how powerful XML could be and how much simpler it could make using the software, I immediately grew fond of it. XML also made coding much easier. It allowed the software to be more customizable without much effort. I did run into some issues of seemingly impossible to customize aspects of Highcharts without using hard-coding, but many aspects were compatible with the XML approach.

In October, Dr. Cindy Walker, Dr Turner, and I went to Savannah, Georgia to attend SAIR. We stayed there for five days and presented on the last day of the conference. I worked extensively to improve to the code beyond what was already planned to be presented. These improvements actually proved to be beneficial because I actually showed some of the code during the presentation something I did not originally plan to do. The presentation went well and we left for Montgomery later that day.

Although the current state of the software is open for customization and works well for what it does, the path to reach this state was not without rough patches and troubles. In my research for the project, it became apparent to me that I may be the first person to do code that the project required. I had to patch together information from various sources to get the first iteration to work. As work continued, I searched for help from many sources online including Highcharts’ API documentation, Highcharts’ forums, and stackoverflow.com. Some problems include finding out how to pull data from multiple CSV files and a successful method of iterating through columns and rows of the CSV files. The original iteration of the code was largely hard-coded. Even though the data was pulled from a CSV file, the actual method of searching for the desired column in the file and finding the amount of the desired value was all hard-coded and not easily customizable, especially for those who have little to no coding experience. This is where XML became the massive improvement that gave the software much more accessibility. The XML made it so that the end users only have to interact with the XML file itself rather than the code that generates the chart.

As stated earlier in the report, although XML has allowed increased customization to the code, there are aspects of the Highcharts code found within the other JavaScript I use that do not appear to be able to be changed other than going into the code itself and changing it. The solution I chose to this particular problem was simply creating almost identical code except for those changes. This is to make it so that the end user does not have to modify the code in order to create the chart they desire. The particular problem that lead me to this was the apparent impossibility to change a specific line of code that allows the displaying of the amount in a column or bar in their respective charts. This solution also makes creating code for a pie chart in the future much easier since I would not have to try to work around the same code that creates a bar chart or a column chart.

Over the course of my internship, I realized more and more how much my education at Faulkner helped prepare me for this project. Perhaps the most helpful courses were some of the first I took during my first and second semesters, Computer Programming I and Computer Programming II. These two courses have been integral in my development as a programmer. As such, their foundation helped me easily become familiar with JavaScript. The similarities of Java taught in those early programming classes to JavaScript made it a really easy language to pick up. I also had experience with XML and HTML, although I did not have extensive knowledge of both. My Internet Programming and Visual Programming courses introduced me to both of the concepts and made sure that I had at least some familiarity with them. Fortunately, I did not have to design a web page that displays the chart in an appealing way. That job is perhaps more suited for a graphic designer or CSIS major, both of whom perhaps have more experience in that regard.

Something that may prove to be useful if for nothing else than to be familiar with it for keeping track of finances or other useful means, is a class that extensively goes over the intricacies of Excel. This internship has exposed to me to Excel more than any other experience I have had at Faulkner. Even though Excel does not have the same importance as learning your first programming language or learning how to create and manipulate databases, it can prove to be useful in many regards. Making the computer applications class a required core class for computer science majors might be more useful than another more forgettable course.

As for computer science courses themselves, I think Faulkner has an excellent curriculum for preparing its computer science students, at the very least in my experience. There is not a time that I feel that my computer science education failed me while working on my internship project. In the little real world experience I have had with computer science positions, I feel confident that the curriculum is more than adequate. The required internship for a computer science majors is one of the most important aspects of it. It helps create a better understanding of work outside of school, and helps prepare the student beyond anything that can be taught in the classroom.

This internship has created within me a profound respect for those in my field who have gone before me and for those who create quality software. This respect has helped me have a new perspective of the work within my field. The struggles I went through with this project seem miniscule to the many different and much more complex pieces of software out there. This comparison, however, does not halt me in my desire to learn more. It has just shown me that I have a lot more to learn. I hope to take what I have learned to become successful in my career to come.

Overall, my experience with my internship has been very constructive. I learned many things not only about my field and what to expect when I start a career, but also about myself, and how I perform my work. I definitely have many improvements I can make, but I have found positive things about myself as well. For one, this internship, and my education at Faulkner, has helped solidify that I chose the right line of work. The sense of accomplishment when getting something to work successfully or improving upon something that was previously subpar is one of the most rewarding feelings I have felt in my life. Computer science is definitely not for everyone. I, on the other hand, have discovered I am becoming more passionate about it. It is something I enjoy hope to excel in as the years go on.