Carlos Flores

STEMPact Research

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My name is Carlos Flores, I am an upperclassman in the Computer Science department at Kean University. This summer I conducted research under Dr. Ching-Yu Huang’s direction along with Rishbh Rhana, and Santiago Roldan; funded through a STEMPact grant.

**Overview of your work:**

I worked on the JavaScript functions for our STEMPact web application project, the JavaScript functions I provided allow for image manipulation and processing. The first couple of weeks I was working with an html element called canvas. The canvas element is used to draw graphics on to a webpage, the canvas is where a user’s image will be loaded and where the user will be able to perform the image processing functions.

I have managed to implement features that allow a user to add notes to their image and perform some light image processing. I have written a function in which a user will be able to invert the colors in an image. This is accomplished by accessing each pixel in an image and performing a simple mathematical operation.

In the same fashion I was able to create functions where a user can increase the red, green, or blue values of an image. The user also has the option to darken and brighten the images as well as convert the image to gray scale. This is accomplished through pixel manipulation.

My hope is to continue research in the fall 2017 semester and add more functionality and features for users of the web app. There is much to be done with pixel manipulations and I hope to continue researching what else can be done with the images.

**Working Environment:**

I worked in a macOS environment for this project. Throughout the course of the project the team and I tried a few different approaches and strategies. This resulted in using a few different languages; ultimately though most of my work is done in JavaScript. I used Sublime Text, Vim/Vi, and Atom as my main text editors. Testing was done in the Google Chrome browser and Mozilla Firefox browser.

**Feedback about STEMPact Program:**

I believe that the STEMPact program is a wonderful opportunity and I am glad that I was able to be a part of it this summer. The experience this program has provided me with has been invaluable. Getting paid to research new technologies has been a great opportunity for me. Instead of having to find a part-time job unrelated to my academic studies, I have been able to earn an income while increasing my skill set. I think It is important to empower students in this way, the STEMPact program allows students to improve themselves.

**Challenges:**

The main challenge that I have faced was the fact that I have not had much experience in working with web technologies. In the past I have created just a couple of static websites for fun, nothing to serious or complicated. The extent of my skills with JavaScript was just completing a few coding challenges online in order to get familiar with the language. I would also rate my skill of using databases as novice. It was a bit of a challenge when I first started working with JavaScript and the database, I had some issues learning the nuances of JavaScript. However, with practice and the ability to ask a fellow researcher, who had prior experience with JavaScript and databases, I was able to work well with those technologies new to me.

**Future work:**

For the future I think it would be great to implement machine learning features to our web application. Perhaps there will be opportunity to predict certain features for users of the web application. Machine learning features would definitely be a challenge worth exploring. In the future a student with a strong mathematics background can help design machine learning algorithms. It is important to push ourselves to strive for excellence. Even if the machine learning approach does not succeed, it is worth a try. It is important to not only succeed but also fail. There is so much we can learn from just exploring the avenue of machine learning.

**Conclusion:**

I learned a lot these past few weeks, I have not had much experience with web programming. In the past I have only made a couple of static websites. It was a wonderful learning experience to be able to create a website with a multitude of different web technologies and be able to connect it to a backend database. I also enjoyed collaborating with my fellow student researchers. It is always a pleasure to be able to come together and deliver a working project in the end. It is important to be able to work in a group together where people can complement each other’s strengths. I really enjoy learning new things and I hope to keep advancing my skills while being able to produce an interesting project.

**Screenshots:**





