Thesis Project Portfolio

Building a New Grading System for CS 2110: Software Development Methods

(Technical Report)

The Psychology of Gaming: How Playing Video Games Affects Our Minds

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

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In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

After every modern American mass shooting, many politicians and media companies throw blame on video games for causing the shooters to perform such heinous acts. Such accusations are not grounded in much scientific evidence and are often simply an attempt to throw the blame at a technology that they don't care to understand. My STS research paper aims to disprove such claims as well as shed light on the positive and negative consequences of playing video games. My technical project was totally unrelated to my research and was inspired by my frustrations with the grading system for the class that I help teach. The current system is many years outdated and has some extra features that make it very annoying to work with. I and my partner set out to build a new system that has a modern interface as well as many quality of life improvements for professors and teaching assistants.

In my STS research, I dive into common issues and benefits of modern video game mechanics and examine scientific studies that show their effects on players. I show how video games can lead to aggressive, but not violent, behaviors as well as potentially leading to gambling and addiction with companies implementing microtransactions and loot boxes that trigger similar reactions as conventional gambling machines. I also show the benefits of games, including improving essential skills and keeping the brain active. Games are also a great way to socialize and bond with friends from a distance, which is especially important in this current coronavirus crisis where people are forced to be separated. Finally, I talk about the emotional benefits of gaming, including distressing and possibly even fighting against mental illness. Since video gaming is one of the biggest industries in the world and a vast majority of young people

engaging with games in some fashion, it's important that we examine how playing such games affects our minds, both positively and negatively.

In my technical project, I worked with my partner to build a new grading system for the class that we are both teaching assistants for. We wanted to build a web application that remedies the problems that our current system has, which includes a terrible search function and causing errors when we click the "Back" button, as well as adding additional features to help professors and teaching assistants grade more efficiently. For TAs, we wanted to build a system to automatically distribute students to grade based on the number of grading hours the TA signed up for. For professors, we added a grading-progress tracker so they can see the progress that each TA is making to keep grading TAs accountable for their work. We also allowed professors to build custom rubrics for their assignments and had that rubric displayed for TAs to use when grading. However, our project faced a major roadblock when UVA ITS failed to set up a back-end server for our project, forcing us to only build out the front-end using dummy data. While most of our front-end pages are implemented, they provide little functionality and are unusable unless a back-end is integrated later.

Both projects, though on different topics, have taught me a lot about running semester-long projects and allocating time for them. Researching for my STS paper has yielded some surprising information about how video games can benefit us, such as a study showing that playing action games can improve visual processing and another showing that exercise games are on-par with a medium-paced walk. Working on my technical project has taught me how to use the Angular framework and how to dynamically create HTML form elements, which I applied to implementing custom rubrics.

Finally, I would like to acknowledge my roommate Stephen Shiao for working on the technical project with me and for taking the lead for much of the time. Thank you for being a great friend and for being there to help me as I was learning how Angular worked. I would also like to acknowledge CJ Rogers and Disha Jain for listening to me as I brainstormed ideas to research and providing input on which of my possible topics would be the most interesting. I couldn't have done this without all your support and I appreciate the memories we've made from the past 3-4 years of college.