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Senior Design

Individual Capstone Assessment

For my capstone project, I will be working with 3 other 5th-year computer science students whom I have gotten to know quite well during my time here at UC. We all have an interest in working with and gaining more knowledge about ML/AI. Thus, we have chosen it as a focus area for our senior design project. Our exact project will be a game that takes in a prompt for a character and level difficulty, and crafts your own sprite for you to complete the custom level. I expect there to be 3 main areas of this project: 2 models and the game. The first model will use natural language processing to ascertain specific metrics from the prompt. This data will then be fed into our second model, which will handle creating the sprite and the level for you to complete. We will also be building our own 2D scrolling game so you can play the level as your sprite.

When thinking about the related material to this project, there are specific courses whose material is related to different aspects of this project. The first of which is Software Engineering (EECE 3090c), as this class covers the basics of software development and how to work with a team of developers. Another foundational class that will be beneficial is Python Programming (CS 2023), as we plan on writing the code for our models and game in Python. Without a foundational knowledge of Python and some of the more common libraries, this project would be significantly more cumbersome. Additionally, Intelligent Data Analysis (CS 6052), which discusses the process of data mining, will be beneficial for developing the necessary models for this project. Similarly, 2 of the courses I am currently taking, Learning Probabilistic Models (CS 6035) and Deep Learning (CS 6073), will hopefully also cover material that is relevant to building the models for this project.

In terms of co-op experience that might be useful for this project, I have lots of experience doing software development. I worked as a software development co-op for London Computer Systems (LCS) for 2 semesters. At LCS, I was able to gain experience as a software developer. I plan on using the skills in API software development to assist my team in building our models and game platform. I also worked as a Quality Assurance Software Tester co-op for LCS before I was a developer. I gained experience testing APIs, doing regression testing, and testing entire projects. I hope to be able to use the knowledge I gained in software testing at LCS by making tests for our project. While at LCS, I was also able to refine my non-technical skills, such as effective communication, by working with multiple different teams across projects. I plan on communicating clearly and concisely with the members of my team. This past summer, I worked as a Solutions Intern for OSA Technology Solutions (OSA). At OSA, I gained a lot of knowledge and a certification in AWS cloud infrastructure. If we plan on hosting our project in the cloud, I believe my experiences this summer will help my team put our project in the cloud.

I am quite motivated to work on this project for 2 main reasons: I enjoy working with my teammates, and I think we will have a good time working on such an interesting and exciting project as this one. Whereas, if I were stuck with random partners, I might be more hesitant to take on such a project. The other reason is that I do not have much experience with AI/ML, and I think this will be a fantastic opportunity to get hands-on experience and put into practice what I have and am learning in my courses. Additionally, there are many different parts to this project, even regarding the AI/ML parts, so I shouldn’t be locked into any one area. With the large mix of technical and non-technical details of the project, we will all need to collaborate extensively and create new ideas. With so many different aspects of the project to work on with people I enjoy working with, I am very motivated to work on this project.

Our initial approach, as discussed above, is to have 3 primary parts to our project: we will have 2 models and a gaming platform to allow people to play as their unique sprites on their custom level. The first model will use natural language processing to get metrics for the different attributes from the user’s prompt. The second model will use these attributes to build and select the best possible sprite and levels. Our final product should be a game where people provide a scenario, and a mini game is generated that they are able to play and rate. I will evaluate my own work on the project by seeing if I was able to positively contribute everything that was asked of me on time, with minimal mistakes, and in a way that helped accomplish the goal. I think we will know that we are done and have done a good job when we have a functioning game we are proud to present at the expo.