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Senior Capstone I

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Individual Essay

From an academic perspective, our project, Qsine, is very exciting. The goal is to create an app that can recognize foods and dishes from a picture and return a common list of allergens that are likely to be present in such foods. While not a foolproof tool by any means as recipes can vary, it’s an interesting tech demo to show off what we’re capable of and help teach us some new tools. The main purpose of this project is to cover machine learning, computer vision, back end / front end, etc. all at once. Web scraping will be invaluable to us in this project, and that’s another tool to add to our repertoire.

Despite all the new skills being acquired, past experiences will be crucial to this project. This project will likely require heavy use of python, a language I’m well familiar with from my studies and curriculum. We’ll need to store our images somewhere and an SQL database makes the most sense, which is another tool I’m experienced with. Any kind of back end from an app will likely involve C# or another interpreted language which I learned in the past, and the team management skills from ENED will come in handy too. Since I spent the first two years of my time at UC as an IT major, I also have far more web development skills than most CS students. This means I can help with the web scraping we need to do and take care of the automated data acquisition so we can get to the meat of the project sooner.

As a software developer at Siemens, the biggest unique skill I bring to the table is testing. While developing features on Solution Link I wrote hundreds of test cases, many of which are still in production today. The purpose of these automated tests was to save time and therefore money by eliminating the need for a human agent when it comes to testing new features. I used the tool Gherkin for this which allows you to code C# functions which correspond to plain English sentences then lay those sentences out in a feature file. It’s an incredibly powerful tool that allows you to quickly make modular code and link it together to save time by reusing code later and creating an entirely new test from the resulting union. I can save my group and myself a lot of time and frustration with this mentality of testing-based development and automatically verify nothing is breaking with each update.

I’m excited to work on this because machine learning is one of those topics which is a major part of the current Computer Science landscape but not taught as thoroughly as one might expect in university. We learn about AI and how to design agents that think for themselves, but not about how to use machine learning as a part of an AI tool. While I likely don’t want to go into a job where machine learning is my main focus, it’s a commonly used part of other jobs. For instance, if a computer needs to recognize something in a specific image and do an action based on what it recognizes, a machine learning algorithm is the simplest way to train it to do that these days. All it takes is some human classification and training and you can teach your program what to look for. Additionally, web scraping has numerous uses when gathering data or acting based on info from various APIs. Working with an API directly will teach me a lot that can then be used for any tool I might want to make in the future which relies on data from another source.

Having worked with some of the group members in the past, I know that they’re good group members who will be proactive and work ahead of schedule. That said, it’s best to have specific goals to have a metric for self-evaluation and making sure we stay on track. The goals for the project should be to get a script that just lets you type in the name for a food or dish then returns common allergens, then to train it to recognize some basic dishes and pipe those outputs into the first script, and then to expand that to more dishes and work on camera integration. For myself, I’ll know I did my job if my assignment of tasks is completed in a timely fashion and my suite of tests is useful in maintaining the integrity of our codebase as the project continues. It’s an exciting project that will broaden my horizons of web development, server back end, machine learning, and API usage. All of these skills feel like they’ve been neglected in recent years and I’m happy to have an opportunity to progress them.