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CS5001 – Senior Design

Senior Design – Individual Assessment

The senior design project that my team has chosen is a web browser extension that will be able to scan and parse websites for factual text content. We would like our software to be supported in major browsers such as Google Chrome or Mozilla Firefox, and it should be smoothly integrated into a web user's experience. The extension will display an assessment for each scanned website according to some sort of grading scale. Selecting the grading scale and defining the semantics behind what constitutes a 'fact' or a 'trusted source' will be a significant part of our project. These criteria will be the crux of our undertaking, and they make up the foundation of the value proposition to our users. To make semantic inferences on web content, our software must be able to crawl the content of a webpage and classify content by processing natural language and comparing it to the implementation.

Reflecting back on the time I have spent in classes at UC, a handful of them will ultimately be indispensable in my work on this project. The first class that comes to mind is Data Structures. It was in this class that I learned how data can be structurally designed, abstracted, and then utilized to create the programming behavior needed. It was also the most code I had ever written in my life up until that point. Other important classes include Software Engineering and Requirements Engineering. These two classes stress the vitalness of properly defined requirements and documentation surrounding the software project being ideated or created. Without clear and meaningful specifications, it's near impossible to effectively create code that will be productive towards solving the problems your project is supposed to. This is especially pertinent to our senior design since "fact-checking" involves many levels of context that need to be defined and documented. Finally, the Design and Analysis of Algorithms class that I have taken is crucial for us. This is so that we can correctly mathematically appraise and optimize the programs we write. A web extension is no good if it stalls the user's flow when working with a browser.

I am very happy with my co-op and internship experiences to date. Although they weren't what I expected, what I received is invaluable. The primary co-op experience for me was my time spent at Honeywell: Intelligrated. There, I was able to learn a lot of in-depth knowledge about setting up and troubleshooting databases and servers. Additionally, I learned about how useful web applications are to users, enterprise or consumer. Even in a machine-control enterprise environment, web apps are deployed to connect local machines with their control software as well as with my department remotely, when needed. More recently, I started an internship at EntermediaDB where I have been learning much more about the usefulness of web applications and web development as a programmer. Many new frameworks and tools, such as Docker and WebAssembly, are currently being explored that will drive a soon-impending revolution in software development. Although our idea is a web extension, I hope that we may be able to design an implementation that will potentially allow greater resilience in future development.

Throughout the many years I have spent at the University of Cincinnati, I have gone through many personal paradigms of thinking. Across most of my journey, I often found it hard

to see the "big-picture" that encompassed why I was learning the things I was, especially when semesters iteratively became more difficult. Although coursework is designed to be regimented and therefore expedient, for me it was rigid and stifling. Outside of classes, working, and fitness, I never found myself with enough time to pursue a substantial project whose cause motivated me. This senior design project represents an exciting start to the rest of my life as a programmer. Having grown up in the cradle of the age of information, I have a deep desire to perpetuate and bolster the benefits that access to information and the internet has provided humanity. However, while I matured, so has the role of mass information in our society. Issues with sourcing, access, and integrity have no doubt caused a multitude of problems that we see today. Information must be accessible, interpretable, and verified through socially accountable methods. Without additional mechanisms in place to assist users of the internet, the newfound culture of search engine driven 'self-research' will ultimately be resigned to cause more harm than good. I am proud to finally begin leveraging my education to attempt to produce some software that stands to potentially benefit not only my community but citizens around the globe.

Initially, I see our design being one that automatically parses and returns results upon the execution of a search engine query. The presentation to the user of the extension and the results may either be a small dropdown menu from the browser's top bar or even potentially an array of resultant tags that are each located next to the websites listed in the query results. Most likely our implementation will involve calls between a server that we run our lexical parsing service on and the extension, but I hope that we can find a way to make the design run in the browser. The ultimate goal is to benefit as many users as possible without sacrificing any quality of the service we provide. It would be nice to choose a design that can be made to easily work in multiple major browsers, but I'm sure that as we research more, we'll have to compromise on some design details. I am not an expert in natural language processing, however I am very excited to learn more about how it can be implemented in a lightweight yet meaningful way.