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Unit 4 Final Draft

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Review of Semester

INTRODUCTION

While incredible ideas, formulas, and programs can change the world, they cannot do so in the mind of the creator. They must be shared. We must depict them in word and image and sound, so we can exchange them with colleagues, friends, and students. Only then can good ideas proliferate and poor ones filter out. Advanced Writing in the Technical Professions helped prepare me to consume and produce such material. Throughout the semester, I reviewed advanced research in computer vision, designed documents to teach design principles, and interacted with the field of trajectory planning for autonomous vehicles. Ultimately, these experiences trained me to communicate my experiences, understanding, and perspective in relation to those of my peers in Computer Science.

UNIT ONE

Early in the semester, we reviewed a document of our choice to analyze how the authors presented information to a specific audience. I chose a paper titled *Real-time human pose recognition in parts from single depth images,* which discussed an algorithm used in Microsoft's Xbox Kinect camera. Compared to other literature that we discussed in class, this paper was incredibly technical, since it was written for computer vision researchers. As such, I didn't completely understand it. Some of the concepts were familiar, since I had encountered them in other classes. However, I needed to research some of the domain-specific concepts such as random-decision forests and mean shift before I understood the paper completely. Despite this, I didn't find the paper hard to understand. The authors broke the algorithm into parts and explained each part individually using colorful graphics and a simple, linear progression. Furthermore, they presented the information in relation to other research in the field, so I could see what they improved and why it was important. Overall, unit one showed me that I can make complicated subjects simple to understand if I organize the information into small pieces and combine them together in a logical manner.

UNIT THREE

The next document I completed was a lesson plan for Citizen Schools' Design Apprenticeship program. As part of a group, I helped revise a series of documents to teach middle school students the engineering design process. The material was familiar; however, we needed to make it simple, fun, and understandable to students who had just finished a day of school. We decided that presenting information as more than a sentence or two at a time would be too much, since students would zone out. Instead, we created colorful flow charts that asked thought-provoking questions, and we condensed the previous worksheets into lesson-specific exit tickets. Throughout the lessons we required students to look at their work as if they were Engineers solving a problem. While this approach resulted in less material to

read, the documents that we created were appropriate for their target audience and were more effective than pages of dense case studies.

One issue that we encountered during this process was communication between people of differing technical backgrounds. For a while, we tried to communicate and pass documents using an email chain. This wasn't a great idea, since the documents got lost, and the chains were hard to search through. For this reason, we took a while to define our goals and spun in circles. As we approached the deadline, I set up a folder on GoogleDrive. This allowed us to collect documents in a single location, which worked much better and took a lot of weight off the email chain. Recently, I learned about a website called Trello, which is a service designed to aid group communication. In future group activities, I will probably try this service. Overall, during this unit, it became clear that having a good communication strategy was the difference between progress and stagnation.

UNIT TWO

Our most significant project was to integrate with a body of current research to assimilate and synthesize knowledge. We were to examine different approaches and decide which were good or bad or needed more research. In my essay for this unit, I discussed trajectory planning for autonomous vehicles. At first, I wanted to discuss the entire field of autonomous vehicles, but as I looked closer, there were many problems to discuss, and I could not cover them all. In fact, while my rough draft was incomplete at 2700 words, I merely surveyed the field and failed to draw any significant conclusions. In class, I couldn't enumerate the competing methods in the field, and I felt like my "different approaches" were solving completely different problems. What really helped me to focus my essay was learning to write an abstract in class. While doing this, I realized that I didn't know what the goal for my essay was. I was trying to compare competing ideas, but I had no metric. After some thought, I decided to focus on trajectory planning with an emphasis on safety and reliability, since it seemed like the most critical issue that is currently being researched. From here, it became much easier to compare different approaches, since I was focused on a single problem with a clear goal for the field. Unit two helped to teach me to express an opinion regarding a body of academic work. While I had previously read and understood academic papers, this was the first time that I had responded to them as a peer.

CONCLUSION

Throughout Advanced Writing in the Technical Professions, I have consumed and created a diverse set of literature. It has ranged from fun, thought-provoking worksheets for middle-school students to a review on cutting-edge research for autonomous vehicles. I have drawn conclusions regarding the design, audience, and purpose of documents, and integrated with a body of thought to assimilate and synthesize knowledge as a peer in the field. This experience has been invaluable. While I may develop incredible programs in my future work, unless I share my experience with others, it may be forgotten, or I may miss a flaw that someone else would see. Overall, these skills will prove incredibly valuable, since my work can only reach its true potential if it can be understood and adapted by my peers.

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