Isaac Measures
Senior Design
Capstone Assessment

Self-Assessment Essay

Our senior design idea is to create an app-controlled product with the capability to remotely dispense beer from kegerators. Multiple different courses we have taken at UC come to mind that have given us the knowledge and ability to tackle something like this. My part in the project (hardware) especially will be aided by the ENED 1020 and 1019 classes which were the initial Models and Foundations classes we took coming to UC. These taught physical aspects of engineering and electricity that will be helpful in the planning and design of our hardware system. Our Computer Science I, Python Programming, Data Structures, (CS 1021, CS 2021, CS 2028) along with many others will help with the software side since those were our initial building blocks to learn coding. The firmware side is also not forgotten since EECE 4029 OS and System Programming gave an in-depth look at low-level code. Overall, I think our courses at UC have equipped us well to handle a project of this size.

Most of my CO-Ops have been software based except for one. At DRS Leonardo I got to work on a Texas Instruments Testing Chassis. This included researching and building out physical components of the machine as well as establishing a testing structure for it. This allowed me physically work with components and think about real-world restrictions like physical space needs and power draw. While the specific work I performed won't specifically be a large aid in this project, this position gave me the confidence to look at and work with physical systems.

I also performed manual QA testing at DRS Leonardo. This involved recording and testing different workflows through a radio communication system and recording the errors we were able to find. Working on this project helped change my perspective from a "Does this work" approach to a more beneficial "What doesn't work" approach allowing mistakes and errors to be found more easily. Along with those experiences I have knowledge and experience working with both Arduino controllers and Raspberry Pi's through interests of my own. These projects have taught me how to work with these micro processors and create larger ideas out of smaller components. Apart from all of that I regularly do physical DIY projects between various things I find to 3D print and I grow tropical plants in a climate-controlled grow-box I sourced parts for and built.

I have 2 main motivations for this project. The first is due to my love of hardware. I luckily found a group with 2 members who don't have an interest in hardware, while I have mainly interest in it. Working with my hands has always been very rewarding, so getting to do it for a project piqued my interest. Gaining experience working with these systems could prove beneficial in the future allowing me to get a job that I will enjoy more. My second motivation is profit. While I am not holding my breath, I do think this idea is a good one and, if marketed correctly, could prove to be a profitable venture through corporate sponsorships and growth, or simply selling the business to an interested industry.

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Preliminarily my approach to this will be CAD for designs. I have experience with CAD software and it would allow a nice interface to flesh out our project and easily make changes if need be. I can also 3D print those CAD models for real-world prototyping. This would also allow me to place the components into the space to make sure the physical limitations work out without needing a full prototype. My expectations for this project are simultaneously high and low. They are high because I see how this could be a real venture and the growth possibilities with it. They are also low because businesses often fail, and through research I have found that this isn't a unique idea and has failed implementation in the past. I will self-evaluate my contributions through simply making sure I do more than my fair share. I have personal motivations for attempting to turn this into an actual business, which greatly motivates me to make sure this is a real-product-approach. I think we will find our end-point through talking with businesses. In order for this to work we would need to cater to the people who have the money to buy it. Working with sponsors/businesses I am confident that we can find a design/solution that has a clear end-form and could compete in a real-world setting.