

Thesis Project Portfolio

“Plant Ladder” - A Vertical Plant Management System

(Technical Report)

Growing Impact of the Internet of Things: Design to Ensure the Future is Accessible for

All

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

Disability and accessibility have always been at the forefront of my mind thanks to my mother. Paralyzed from the waist down since before I was born, my mother has always been an inspiration to me, and having a glimpse of the world from her perspective is a privilege. Small design choices make a big difference, and actions that most don't think twice about have a huge impact. I started my college experience at UVA writing about a device that would help my mother in her daily life, so it will be fitting to end it by analyzing devices I have learned about from that unique perspective. Through lived experience, I know that accessibility is not always a main concern during design and development of everyday technology. In an effort to understand how to overcome typical issues, I wanted to delve deeper into how the Internet of Things industry accounts for those issues as it grows.

For the technical project, our team designed an automatic plant watering system, named the "Plant Ladder". Loosely fitting into the definition of IoT, it was designed to monitor an array of plants and keep the user updated on the system's status through a mobile application. Due to the speed at which we created the working project, there are areas that required sacrifices. One such area was the number of features on the application. Our application was designed to monitor and not interact. With more time, we would have liked to add more features to the system to allow for more robust control of settings and highlight the analysis of sensor data. Our use case would have greatly benefitted from the added functionality. A longer design process would have also allowed for consideration for an accessibility related use case, which could have benefitted from the knowledge I gained during my STS research.

In my STS research, I evaluate the successes and shortcomings of designing for disabilities in the Internet of Things. Current issues in the design process, if not accounted for and remedied, could mean a decrease in usability for people with disabilities rather than an

increase in independence. Identifying possible issues allows for adjustment towards making sure that the technology is usable for all people. By evaluating cases of success and failure of accessible design, I can make a clear picture of possible improvements on a large scale. Identifying points of contention and concerns during the design process and where the shortcomings are, would not only improve accessibility, but the design process as a whole.

The combination of the technical project and STS research allows me to see the bigger picture of how designing IoT devices will change the relationship between user and technology. Personally designing an IoT device was one small part. Due to completing the technical project months before settling on my STS research topic, I never considered how the app may have worked on a larger scale. The question of whether the project would have been usable or actually assistive for users with disabilities was never asked. However, without the technical project, I would have considered incorporating accessibility into the design process for IoT a much easier process. In other words, the technical project improved my sense of what is possible while the STS research changed my view on how to approach creating accessible technology.