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REU Experience Summary

I am blind, a father of three daughters, a non-traditional student and a senior at University of Maryland, College Park majoring in Information Science at the UMD iSchool; hoping to specialize in Human-Computer Interaction in graduate studies. I value education not only in the practical sense (degrees and employment) but also for how it shapes me as a person and allows me to contribute to our society. Given my interest in computing, I took several Computer Science classes in parallel to my course work in Information Studies. The knowledge I gained from these classes has helped my contribution to my community by providing assistance to other visually impaired friends and fellow students interact with technology. I began to think that computing may be a subject worth investing my life in. I believe I am indebted to our society in various ways and I want to make contributions in the "Jesuit tradition for the glory of God and the well-being of humankind". Studying computing might pave the way this goal.

This summer, I participated in the Distributed Research Experiences for Undergraduates (DREU) program, a summer internship program supporting female and underrepresented students. I found out about this opportunity from Dr. Hernisa Kacorri, an Assistant Professor at UMD. I was introduced to her a couple semester ago by one of my instructors, Dr. Bonsignore. I was interested in her research on Accessibility and wanted to work with her over the summer. After expressing my interest, she invited me to join her research lab, the Intelligent Assistive Machines Lab, and she directed me to AccessComputing. And this is where my journey with Access Computing started.

When given an opportunity for REU this summer, I chose to stay here at the UMD iSchool and work with Dr. Kacorri as my mentor. My project is very close to my heart as it allows me to contribute to novel assistive technologies that can improve the lives of people with visual impairments. Moreso, it was a fun project that gave me the opportunity to interact with graduate student and get a pick at what research is. Specifically, in this project I collaborated with Kyungjun Lee, a CS PhD student who provided advisement and mentorship, Dan Yang, an incoming HCI graduate student, as well as June Xu, an impressive hard-working freshmen in Computer Engineering.

My task involved helping with the design and implementation of the data collection process that will serve as a benchmark for our machine learning algorithms. This involved engineering the stimuli and all possible variable for photo taking of everyday objects by blind users. I contributed to the first dataset that is currently replicated by other sighted and blind users as well. This dataset plays an important role in the project as it will be used to train and test computer vision models to be incorporated in a

wearable or mobile device as a teachable objection application for blind users. Specifically, blind participants will be training the mobile application with snapshots of object of interest and can provide custom labels as well as object descriptions through audio.

Prior studies that show that there are many benefits for people who are blind and visually impaired living in their own homes rather than assisted living facilities. We are hoping that the assistive technologies from this project will help in this direction. Currently, the project is considering objects that include and are not limited to kitchen items such as packages of food, bedroom items such as clothing,

as well as everyday items in the bathroom. During this summer, we explored teachable object recognizers, where I, as a blind and REU participant trained a mobile application with a few snapshots of objects of interest (that we chose to serve as stimuli) under different conditions (hand in the scene, lighting, background noise, camera position, camera mode, etc.).

I had an awesome experience working as a team member of such a diverse group. Working with graduate students and hearing their stories post-undergrad was very rewarding and eye-opening. It was also a great networking experience as I attended research talks and got to discuss with research visitors about their work. Specifically, I would like to thank my advisor, Dr. Kacorri for inviting and setting up a meeting at the beginning of my internship with Ali Abdolrahmani, a PhD student at University of Maryland, Baltimore County. Ali was the first blind PhD student that I have met. Not only were our discussion fruitful but also through him I got introduced to an entire network of blind researchers. Honestly, I had an excellent time working at the IAM Lab through this DREU program. I and owe this to many people but more so to AccessComputing. This alliance has helped me in so many ways, and I would recommend any fellow student who is blind or visually impaired to join them. Of course, there were challenges. This is the first year that the CRA-W opened the application process for students with

disabilities and there is more to be done there to make the process and their interfaces more accessible. Also, finding a reader or scribe right before the summer is hard. Student tend to go away for summer vacations or internships. So, I would recommend that one starts this search early on. The most

important lesson I have learned this summer is that a slow start does not mean a productive end. Being able to do what I love for an entire summer has been a priceless experience. Through this program, I learned technical skills such as programming in HTML and LaTeX as well as analytical thinking, reading scholarly articles, and experimental design processes.

The DREU internship program has helped me accomplish my goals in gaining research experience and pursuing research opportunities for future graduate studies. And why stop at a Master's degree? Initiatives like AccessComputing empower students like me to dream further and leverage their life experiences to make a better world. Hopefully, next time you hear from me, I am a PhD student. And that's a new dream!

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DREU 2018

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