Thesis Project Portfolio

Accessible Navigation Mapping: Supporting People with Mobility Disabilities for Wayfinding

(Technical Report)

Evaluating Campus Infrastructure: Assessing Prioritization of Disabled Communities in Universities Through Architecture

(STS Research Paper)

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Introduction

Both my technical and STS reports focus on the accessibility of post-secondary educational campuses for individuals with mobility disabilities. My technical report focuses on developing a resource for the University of Virginia to improve wayfinding for students, staff, and faculty with mobility disabilities or impairments. My STS report researches how the physical infrastructure of college campuses reflects the prioritization of the school's students, staff, and faculty with mobility disabilities.

Technical Report

University campuses often present navigation challenges for individuals with mobility limitations due to complex layouts, unclear signage, and frequent construction. Furthermore, many universities have historic buildings constructed well before the Standard of Accessible Design came into effect, which set minimum requirements for public and commercial facilities to be accessible. All these different factors can result in wayfinding at college campuses becoming an additional barrier for those with mobility-related disabilities. Wayfinding is incredibly important to allow people to get to know their surroundings, as well as to build a good sense of comfort and familiarity with their environment for all pedestrians, regardless of their level of disability. Effective wayfinding goes beyond simple directions; it fosters independence, well-being, and economic opportunity. Moreover, what may seem like a simple task can be a

significant hurdle for those with disabilities. Therefore it is important to create a tool allowing individuals to feel more comfortable in navigating their environment. The research conducted aims to investigate the challenges of using the existing wayfinding methods and propose a comprehensive wayfinding application to improve accessibility at University campuses specifically designed for individuals with mobility limitations.

First, we conducted a literature review of existing wayfinding projects to tailor our application to UVA's specific needs. We then conducted a survey to identify key accessibility features desired by users, such as ramp locations and information on sidewalk congestion times. Building on these findings, we developed a process for gathering data on existing accessibility features and barriers within the UVA Engineering School Campus. Furthermore, we collected video data to investigate accessible navigation routes and mapped various campus buildings and outside pathways using RGB-D cameras and LiDAR sensors. The findings from the survey results and the proposed structured approach for data collection provide actionable and feasible recommendations to improve the current accessibility resources available at UVA. This project seeks to lay a foundation for building this app by determining key data elements and providing guidance on a method to collect a subset of these data elements efficiently. This resource will serve as the foundation for a future university-wide solution.

STS Report

My STS paper researches how the physical infrastructures at university campuses built in relatively hilly/steep terrains, reflect the prioritization of the mobility-disabled populations at these institutions as either a priority or a secondary consideration. I utilize the technological politics framework by defining campus infrastructures as a technology that is political, thereby

enforcing certain power structures towards people with mobility disabilities. I use this framework to demonstrate further how the built environment at these institutions is an evolving technology that is incredibly impactful to educational equity and opportunities for access and inclusion. To understand how campus infrastructure reflects the prioritization of accessibility, I conducted a comparative analysis of the University of Virginia (UVA) and the University of California, Berkeley (UC Berkeley). In addition to looking at the current physical layout of each campus, I also explored the historical landscape through past policies and events that influenced accessibility at each institution. This historical context provided valuable insights into the evolution of their approaches. Additionally, I researched planned projects aimed at improving accessibility for students, staff, and faculty in the future. By considering these past, present, and future aspects, I gained a more comprehensive picture of how each university prioritizes accessibility through its physical infrastructure. The analysis included conducting a series of interviews with relevant and knowledgeable faculty at both institutions, including the UVA Office of the Architect, the Student Disability Access Center at UVA, and the Physical Access Compliance Manager at UC Berkeley. The findings from the paper aim to inform institutions to use their campus as an opportunity to create an equitable experience by prioritizing the voices of their students, faculty, and staff with mobility disabilities.

Conclusion

Working on both the technical and STS reports proved to be incredibly insightful for me. My STS research provided an opportunity to educate myself on barriers that people with mobility disabilities have to face and the impact of these barriers. Additionally, my research allowed me to gain a better understanding of how these barriers came to be and how accessibility

continues to evolve over time. I am especially grateful for the opportunity to interview faculty at both UVA and UC Berkeley because all of them have added to or changed my understanding of how I view accessibility, especially the accessibility of the physical environment. In parallel, my technical project allowed me to delve into the specific needs of students, staff, and faculty at UVA with mobility disabilities. Additionally, the technical project allowed me to gain experience in developing a wayfinding application and working with different sensor technologies. My research in both the technical and STS reports has enriched my understanding of the barriers faced by individuals with mobility disabilities, and not only highlighted the barriers that exist but also the potential for innovative solutions to create a more inclusive future.