# Project Proposal - Guidance Utility for Impaired Daily Experiences (GUIDE)

## *Team 6*

## Need Statement for GUIDE:

The visually impaired population makes up around 285 million people all over the world, 39 million of which are completely blind according to the World Health Organization. Although there have been many innovations to accessibility and our infrastructure, it remains difficult to navigate certain environments such as university campuses. The current limitations for the visually impaired include the inability to detect obstacles in front of them and the distances of those obstacles. Knowing these two pieces of information can better aid the visually impaired in navigating college campuses, making higher education more accessible. The current solution involves static walking sticks that can signal the visually impaired if an obstacle is in front of them when the stick touches the obstacle.

Given the current limitations of technology for the visually impaired, a system is needed to provide full spatial awareness of their environments as they navigate the area around them. This can better aid the population by providing real-time feedback to the user.

## Objective Statement for GUIDE:

GUIDE is geared towards visually impaired individuals, serving as a means to detect obstacles and to provide feedback to the user to alert them of their surroundings. Through depth detection connected to a vibrating handle, GUIDE will inform the user of their surroundings and any obstacles in their way as well as the relative distance from the obstacle. It will allow for changing sensitivity to allow the user to have more control over their experience.

## Requirement Statements for GUIDE:

* GUIDE will provide real-time feedback with delays less than 0.5 seconds to its users. It will allow for different metrics to be modified so users can tune the performance to their needs and wants.
* GUIDE will use a depth camera to detect obstacles 2m away and provide real-time feedback, allowing visually impaired users to navigate safely and independently in various environments.
* GUIDE will use affordable, high-quality parts and materials, and will not exceed the budget of $300. The design will not be intended to be replaced, but rather last as long as the warranties of the parts allow.
* GUIDE will be powered by commercially available batteries that can be replaced when out of charge. In the event of a future iteration, it should include charging capabilities.
* GUIDE will have a battery life of 3-4 hours where the user will have complete operational use of the device.
* GUIDE will be made of resources and materials that are not harmful to the environment. The use of the tool will not have an impact on the environment it is being used in.
* GUIDE will be developed from materials that are not harmful to the user and never intentionally put the user in harm's way.
* GUIDE will comply with all relevant laws and standards for assistive devices, ensuring it meets safety, environmental, and accessibility requirements.
* GUIDE will feature clear maintenance instructions, ensuring long-term reliability and ease of use.
* GUIDE will be designed using widely available materials, enabling cost-effective manufacturing and easy quality measures to meet.
* GUIDE will be able to operate at any time of day, as well as both indoors and outdoors. While not completely submersible, it will be able to withstand small amounts of water in the event of rain or spills.
* GUIDE will be designed to comply with government regulations and policies related to assistive technology, ensuring it aligns with public health and disability advocacy standards.
* GUIDE will accommodate the needs of all users, no matter the degree of visual impairment. The implementation and design will be thoughtful and respectful
* GUIDE will be user-friendly, with intuitive controls and adjustable settings, making it accessible and easy to operate for visually impaired individuals of varying tech experience.