

# 4G06 Project Goals & Description

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## Capstone Group: Next Step

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## Project Description

### Motivation

In the past few decades, technology has advanced exponentially. While this has drastically increased many aspects of most peoples' daily lives, many minorities, specifically the visually impaired, have been left with their archaic tools to navigate everyday situations. The walking stick is a prime example, as it relies on the reactivity of the individual after near contact with obstacles rather than preemptively helping them move around. A report by Vision Australia (Vision Australia, 2018), states that nearly a third of blind people have been hit, or nearly hit by electric vehicles in Australia, this is far from ideal. Combining the danger factor with the social stigma the visually impaired must face, there should exist an alternative way for them to interact with life and feel more included in today's fast paced society.

### Proposed Project

Next Step is a wearable device, in the form of glasses, that would remove the need for visually impaired people to use a walking stick to navigate the world. The glasses would be able to detect objects in the user's path and relay to them through a speaker where to move to avoid running into said objects. The product will aim to target slow moving and stationary objects first, then move on to target faster moving objects once the basic functionality is complete.

## Goals

### Minimum Viable Product Goals

General Goal	Explanation	Reasoning
<b>Data Collection and Processing</b>	The device needs to collect information about the areas in front of the user and process them to determine the obstacles in a reasonable amount of time.	The device will try to process a user's point of view and what the natural course of action would be to avoid an object.
<b>Communication to User</b>	The device needs to communicate to the user clearly and practically about the obstacles in front of the user.	The device is intended to help user to avoid obstacles, thus it must communicate the obstacles it finds to the user.
<b>Ease of Use</b>	The device needs to be practical for use by those who are visually impaired. This includes simplicity of design at the fore front.	People who are visually impaired usually have a harder time to use more complicated devices, and special designs are needed for them.
<b>Battery Life</b>	The device must have a long enough battery life for a reasonable amount of use in a single day.	The user shouldn't be limited to certain time intervals to live their daily life. The device operates on its internal battery; therefore, it requires a battery life that is sufficient for reliable use.

### Stretch Goals

General Goal	Explanation	Reasoning
<b>Detect complex terrain and complex objects</b>	The device can detect a change in elevation and fast-moving objects and alert the user as to the appropriate action.	A user may encounter stairs, escalators, or fast-moving objects like cars in their day-to-day life.
<b>Full range of motion detection (360 degree)</b>	The device can detect objects all around a user and can alert them of the appropriate action.	A user may be in a situation where objects or people are approaching from behind or to the side and would need to react.
<b>Bluetooth integration with smart phone</b>	The device can connect to a user's phone to direct them to a specified location using a GPS service.	A user may be in a situation where they need directions for a destination.

## References

Vision Australia. (2018, October 15). *Electric and hybrid cars putting pedestrians at risk*.  
Electric and hybrid cars putting pedestrians at risk | Vision Australia. Blindness and low  
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<https://www.visionaustralia.org/community/news/2019-08-23/electric-and-hybrid-cars-putting-pedestrians-risk>.