**Inspiration**

Due to major medical advances, visual defects are decreasing at a greater pace in the present century than they were before.

Per the World Health Organization, more than 300 million people across the globe are estimated to be visually impaired in which 40 million people are blind. About 90% of the 300 million people affected are known to be living in low-income settings without any financial support to cure the defects. It is known that almost 80% of all visual impairment can be avoided if enough financial support and awareness is given!

As caring and responsible citizens of the technical world we live in, the vast amount of skills we have acquired over the years have combined years of technical knowledge which helps raise awareness and provide financial support! Together we envisioned an dream of a human race that can be free of visual impairments.

**What It Does**

VRi is a Virtual Reality app based for the Google Cardboard. The main functionality of VRi is to provide users with an opportunity to witness how people with visual defects see, interact, and interpret the world around them.

VRi takes in a YouTube video and applies a custom made filter of each visual defect configured into the program of the VR App. This custom made filter allows users of the VR App experience the vision of a variety of visual defects. The final product of the users experience gives them a feel on how fortunate they are without visual defects and a taste into the broken world of a visual impairment.

**How we Built it**

In order to complete the app with the utmost efficiency, we decided to split our team into two. One team handled the design, visual effect and aesthetics of the app white the second team worked on researching, creating the custom filters on Android Studio, and attaching them to YouTube videos.

In order for our app to provide users with a realistic experience of visual impairment, we had a conversation with a fellow team member’s cousin who has first-stage Glaucoma. The details she provided about her vision and her inheritance not only helped give us a realistic point of view, but it gave us the idea of causing the user to feel a certain sense of empathy.

**Challenges we ran into**

Acquiring the sensitive topics of various visual defects was a very difficult for us because the only person that we knew capable of discussing such delicate details was back in Toronto. However, even with roaming charges, we contacted her, and talked for more than an hour to fully grasp first hand knowledge on her experience with her vision.

Another major challenge we faced was that only one team member had experience working with Android development. Through hours of learning off YouTube and attending workshops, we produced an app which we can say is certainty the best personal project we have made.

The challenge which played around with the time was creating the filters. None of us had done a VR Hack or create something as complex as the filters. This proved to be very time consuming and we were happy once we got the final results.

**Accomplishments we are proud of**

PennApps was a first-time hackathon for one of our team members and we are proud that we introduced a successful hackathon experience to him. Each team member was able to mentor him in a variety of ways of building projects in hackathons, as well as include him in a variety of tasks even though he had no first hand knowledge in app development.

Finally, the accomplishment that we are most proud of is creating a product with the ability to make others empathize with an issue. We believe that the first step needed in order to take action is to put people into the shoes of those with visual impairment. Through this, we create the emotional connection needed in order to care about it more instead of merely throwing random facts and statistics to raise awareness.

**What we learned**

As said above, only one of our team members had experience in working with Android development. By attending the workshops and learning it ourselves, we were able to build an app from scratch using various resources at our disposal.

However, as funny as it may seem, the most important aspect of the things we learnt here had nothing to do with technology, but rather, about human interaction and emotion. The topics we researched made us realize how lucky we were to be able to enjoy what we see on a daily basis. From the moment we open our eyes when we wake up, and close them when we sleep, comprehending the world through vision is something we have learned to appreciate.

**What’s next for VRi**

What we did with our app was take a YouTube video and apply a custom made filter of each visual defect into the program. Now imagine if we could take it to the next level and add the filters to whatever a person sees through their phone camera. This would make the app all the more intuitive and we can physically see what a person experiencing visual impairment sees.

One challenge we came across that prevents us from doing this is that the Google Cardboard does not have a camera slot. Since we don’t own the Cardboard we could not cut part of it to make a slot and thus we decided to just focus on a simulation using YouTube videos. However, we plan on constantly upgrading and maintaining the app so that more and more people can be aware of the variety of vision illnesses.