InSight

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Introduction and Objective

Introduction:

In the realm of eye care and vision correction, the traditional method of determining a person's eye power relies heavily on manual processes, involving the use of multiple lenses and subjective patient feedback. This time-consuming and somewhat imprecise approach has long been in need of a modern, more efficient solution. To address this challenge, we embark on a groundbreaking project aimed at automating the eye power assessment process. By harnessing cutting-edge technology, including camera integration and image processing, we seek to provide a streamlined and more accurate means of determining eye power while enhancing the overall patient experience.

Objective:

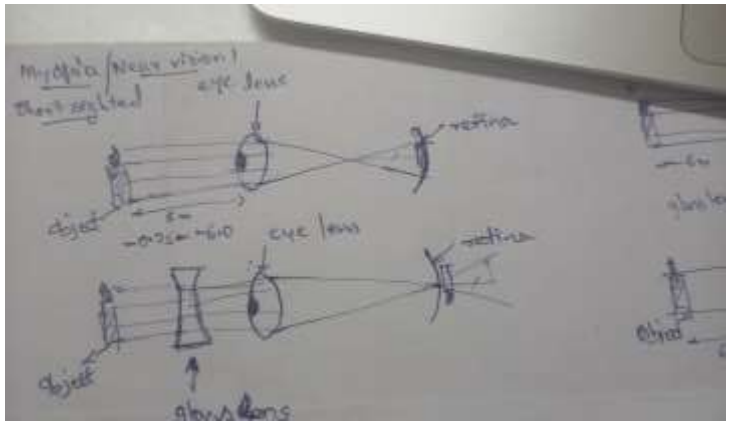
The primary objective of this project is to develop, implement, and refine an automated system for the precise assessment of a person's eye power, ultimately eliminating the need for manual intervention and improving the efficiency and accuracy of the process. This innovative system will incorporate several key components: the integration of a camera with a range of lenses calibrated to represent various eye power levels, the creation of a user-friendly software interface for patient image selection, and the utilization of advanced image processing techniques for enhanced accuracy. Our project seeks to optimize user interaction design, facilitate data handling, ensure regulatory compliance, and continually improve the user experience. In doing so, we aim to revolutionize the field of eye power assessment, making it more accessible, reliable, and patient-centric.

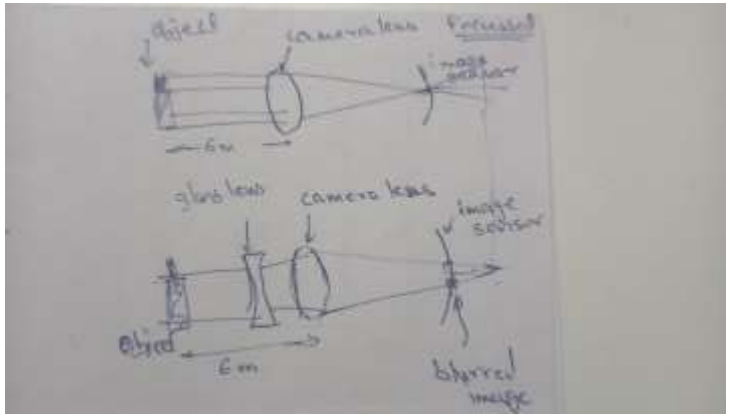
Workflow of Methodology

1. Take multiple photos of an object with different lenses
2. Keep the lens at a distance of 12mm from the front of the camera
3. Click a photo for each lens and store in a database
4. Use a Snellen chart on the frontend and have a patient choose the first line that isn’t clear to them
5. Have a set of lenses mapped to each line such that when a patient chooses a single line they are then shown the images taken with the mapped lenses
6. Compare each image to each other such that one image will be the most clearest to determine the patients eye power

Results

The usage of different lenses does impart varying effects on the object, albeit with nearly identical levels of clarity. This incongruity poses a significant challenge in the accurate determination of a patient's precise eye power, thereby introducing shortcomings in the methodology and its practical implementation. We also were able to conclude that there is no current technology to emulate depth on a computer screen. The other inference we gained was that the mechanics of the eye cannot be mimicked onto a camera since the focal length of a camera stays constant while that of the eye changes for every minute change in the environment





Conclusion

- In conclusion, the utilization of different lenses in the eye power assessment process, while yielding images with nearly uniform levels of clarity, presents a notable impediment to achieving a pinpoint accurate determination of a patient's eye power. Additionally, it's essential to acknowledge that this challenge may be attributed, in part, to the fundamental disparities between how a camera captures images and how the human eye perceives visual stimuli. This underscores the need for further research and innovation in eye power assessment methods.
- Future Scope: The development of this same project on a VR headset could solve all the problems we encounters and allow us to test out eye power from our homes