

Section V: Conclusion

Avoidable vision loss is a major problem in the world, with over 1.1 billion people suffering from it. Glaucoma and cataracts are the two most common eye diseases that are adding to the number of cases of severe vision loss due to the lack of reliable, accurate, and cheap point of care diagnostic methods. Hundreds of millions of people remain undiagnosed and suffer the consequences. To encourage the early detection of glaucoma and cataracts, OptiCare created a system that incorporates novel point of care instruments a complimentary mobile application to boost the accessibility of eye care. There were three main objectives: creating, testing, and modifying instruments to measure IOP and produce fundus images, developing machine learning and mathematical models based on input data from the instruments, and finally, creating a mobile application incorporating the models to boost accessibility and make OptiCare available to billions of people. After experimentation, a novel instrument observing fluctuations in IOP was successfully created, the fundus imager was modified as needed, and the machine learning models performed well: the validation score of the cataracts model was 87%, and the validation of the glaucoma models were 86% and 80% for the right and left eye respectively. This study was a success as it completed all objectives. In the future, further improvements can be made by implementing a larger microphone and speaker while maintaining point of care accessibility to capture the fluctuation more distinctly in IOP of the novel instrument. In conclusion, OptiCare incorporates novel revolutionary technology that has the potential to change the world and save hundreds of millions of people from going blind.