Eye Disease Simulator

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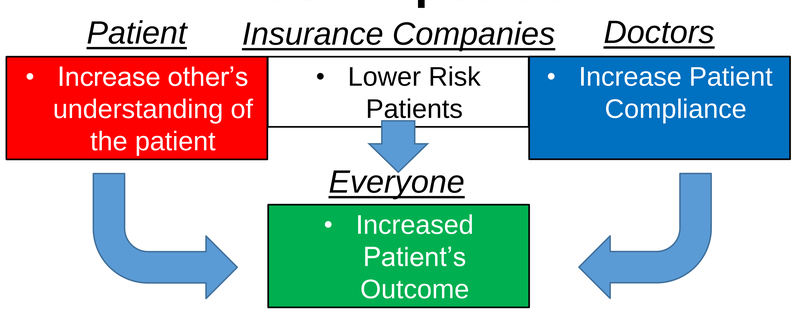
Introduction

Eye diseases hinder people's ability to perform everyday tasks. It is difficult for a patient to accurately describe to others how their condition affects their vision. Doctors also have trouble explaining to patients how the disease may progress if the patient fails to follow the prescribed treatment. There are two goals for the simulator. First, we aim to improve patient's quality of life by improving the patient's ability to communicate how their disease affects their vision. Secondly, we aim to improve patient outcomes by increasing patient compliance. This will be accomplished by improving doctors' ability to communicate the possible progression of the patient's eye disease.

Value Proposition

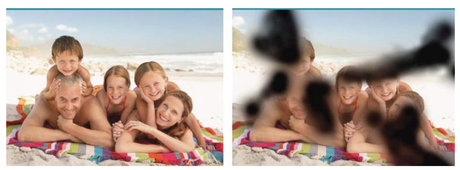


Eye Diseases Statistics[1]

Cataracts[4]
24 million Americans

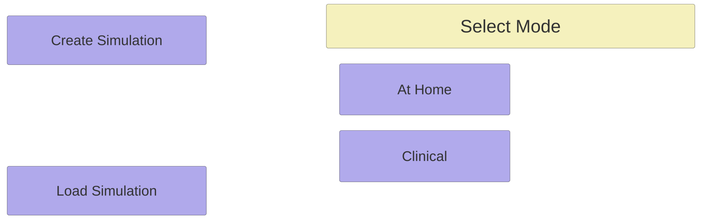
Age-Related Macular Disease[2]
2.1 million Americans

Diabetic Retinopathy[3]
7.7 million Americans



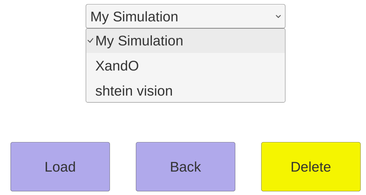
Glaucoma[5]
2.7 million Americans

Simulation Demonstration

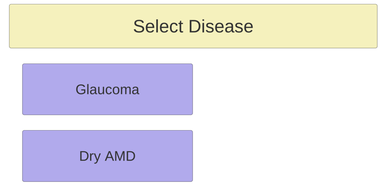


1. Create or Load Simulation

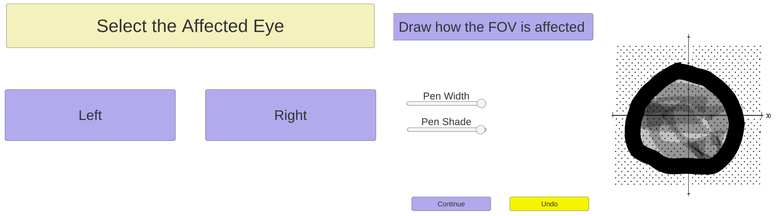
2a. Select Mode



2b. Load Simulation



3. Select Eye Disease



4. Select Eye

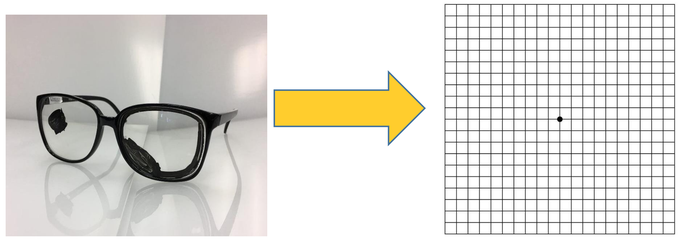
5. Draw Affected Area

6. Run Simulation

7. Save Simulation

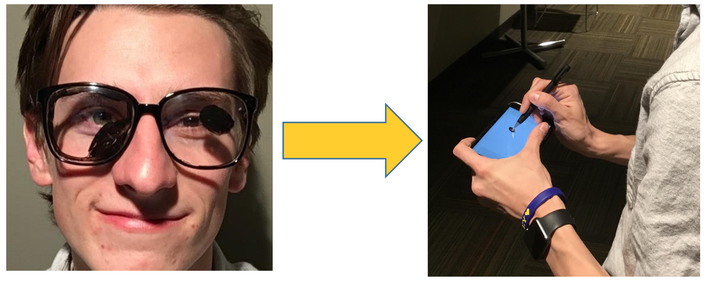
Validation Test

The purpose of the eye glasses-maker test is to verify that the simulations are realistic.



Modified Glasses

Helper Grid (w/o glasses)



Conclusion

Our eye disease simulator can successfully simulate different degrees of vision loss in either or both eyes. This allows us to accurately simulate disease such as Dry AMD and Glaucoma. The user can create simulations based off of the Humphrey's Test results or using an at home test. The user can also save simulations or load previous ones. From the eye glasses-marker test, we have validated that our simulator is realistic. There is a lot of work that can still be done. Ideally, a study should be performed to quantify how using the eye disease simulator affects patient outcomes. Also, the eye disease simulator could be improved by having a larger field of view and having the ability to simulate more diseases like Cataracts and Wet AMD.

References & Acknowledgements

1. "Eye Disease Statistics." Eye Disease Statistics Fact Sheet (n.d.): n. pag. Web.
2. http://www.applevalleyeyecenter.com/services
3. https://waterloovisioncare.com/diabetic-retinopathy/
4. http://www.westtexaseyeassociates.com/cataracts
5. http://www.glaucomadelsureste.com/glaucoma-del-adulto/

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