EyeLight gives Highlights

TrueVision Alcon
Louis Huang, Joshua Lakin, Christopher Lin, Kevin Mata, Jacob Zamora

Our Problem

- Length of a surgery can be between 10 minutes and several hours

- To evaluate their performance, surgeons need to watch the (recorded) entire operation

- Our project, Eyelight, analyzes a video of the operation and generates a report

Background

- Alcon - our mentor company, produces eye surgery assistance machine.
- The machine zooms in the surgical part and outputs a 3D video on the screen.
- The machine also records the surgery, which is what we want eye-light to operate based on.
- Attempting to add features to further assist surgeons

Details

- React Frontend with Python Flask Backend
    - React will handle user input while Flask will handle the interactions with the input
    - The flask backend server will run the machine learning algorithm
- Retraining Inception V3 model for tool recognizing .
- Firebase as our database
- Innovation
    - Eyelight adds value to Alcon's surgical machine, giving analyzed result that can be used for educational purpose and medical discussion.

Challenges

- Lack of experience with React or Flask
  - Trouble coming with with the ideas
  - Trouble getting the output from other files to show up on the frontend
- Real-life surgery training data are hard to access
  - We are getting training data from Alcon's mock surgery room.
  - Amount of tools are limited
  - Surgery conditions may differ.

Plans for CS189B

- Improve machine learning algorithm for the classifier
- Implement user authentication (using Firebase authentication)
- Better user interface
- Have server run on the cloud