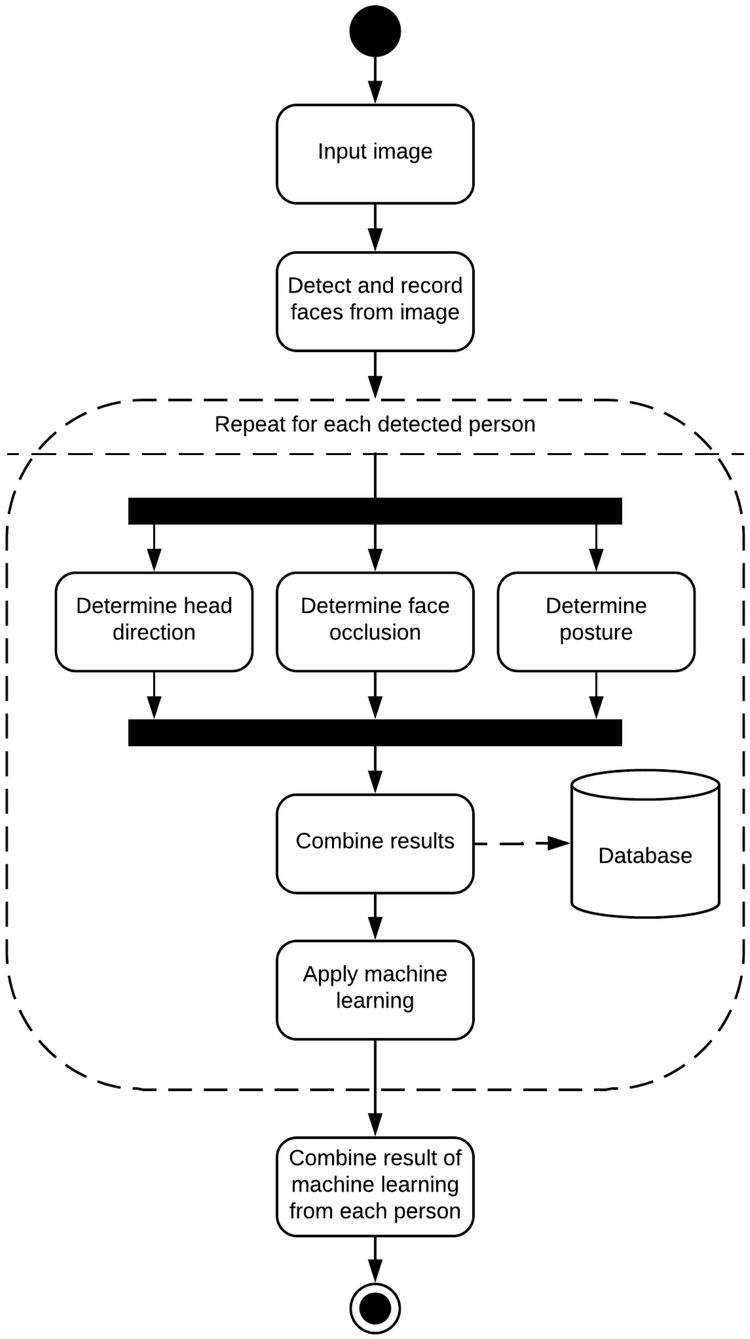
Analysing Audience Attention

Motivation

- Children at school
- Lectures / presentations
- Commercial user testing

Planned Pipeline

1. Detect faces.
2. Apply Computer Vision techniques.
3. Feed to machine learning to create hypothesis for attention.

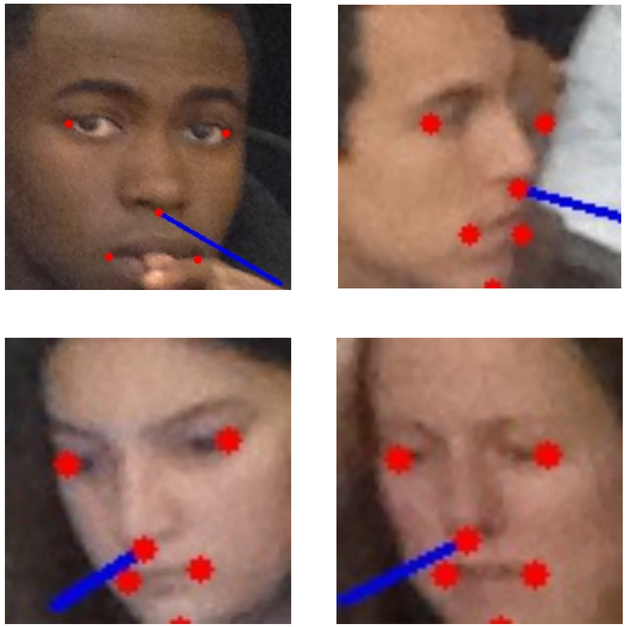


Stage 1: Face Detection

- Uses a number of different pre-trained classifiers and combines their results
- Applies heuristics to increase true positives and reduce false negatives

Stage 2i: Detecting head pose

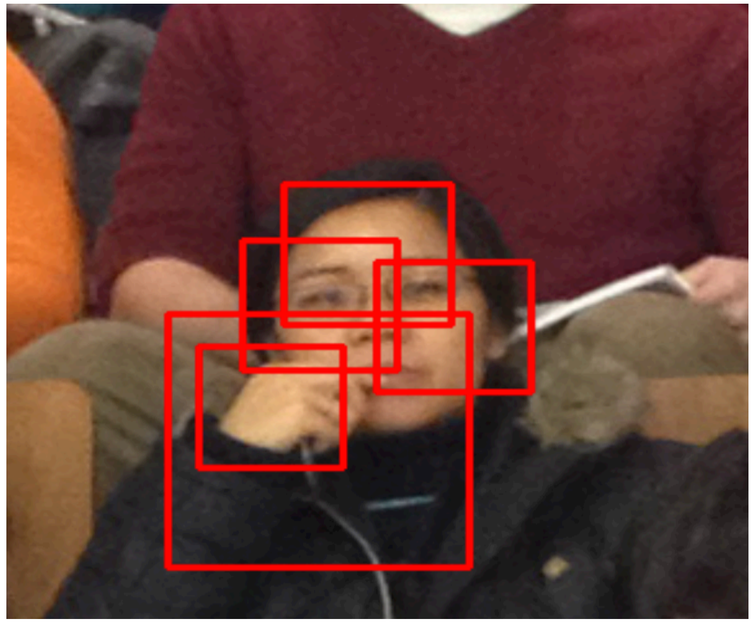
- Extract face landmarks using dlib library.
- Use solvePnP to compare against a standard arrangement of the points to give a pose (6 axis)



Stage 2ii: Detecting occluded faces

- Attempt 1: Use Haar cascades on hands. These are good for detecting objects through edge features, with its key advantage being speed.

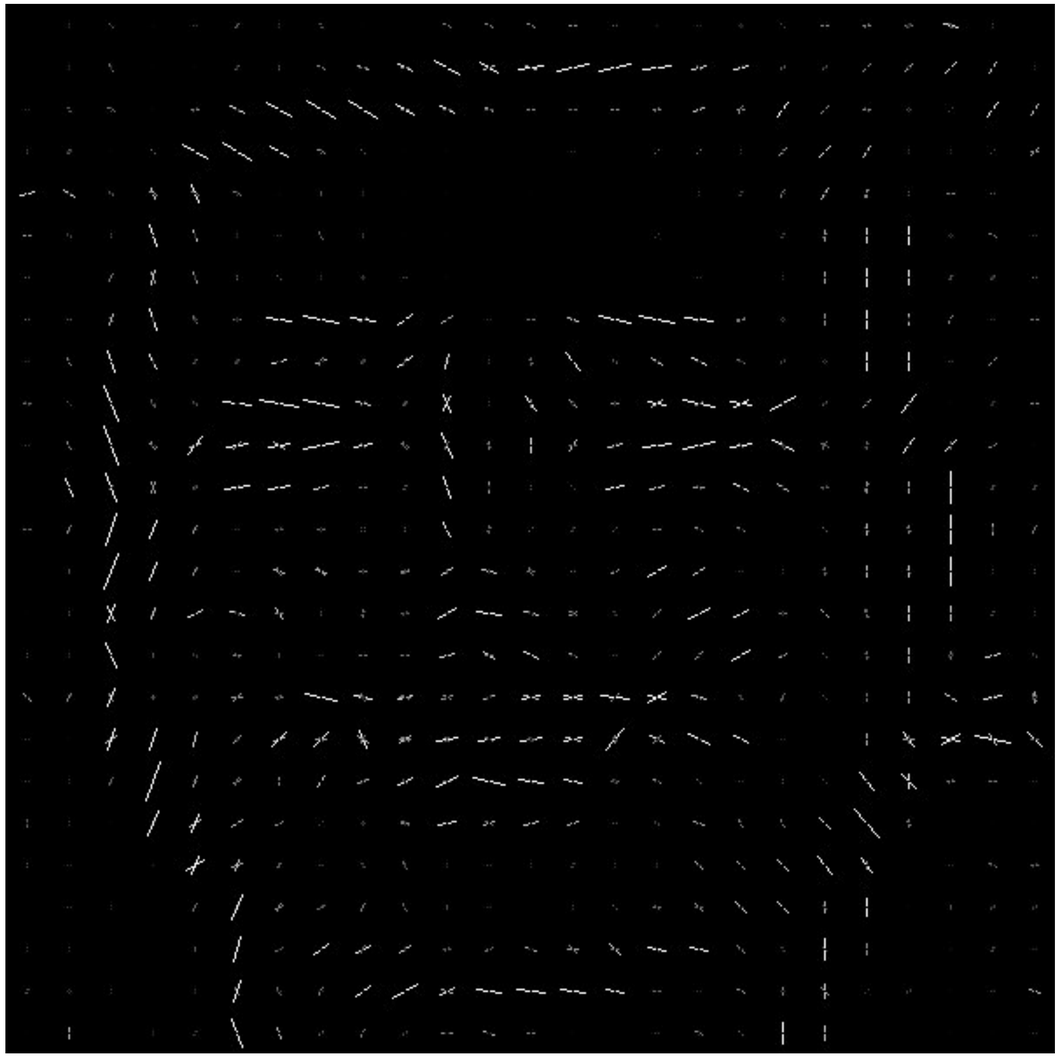
- However this did not work. Too few samples of too low quality.

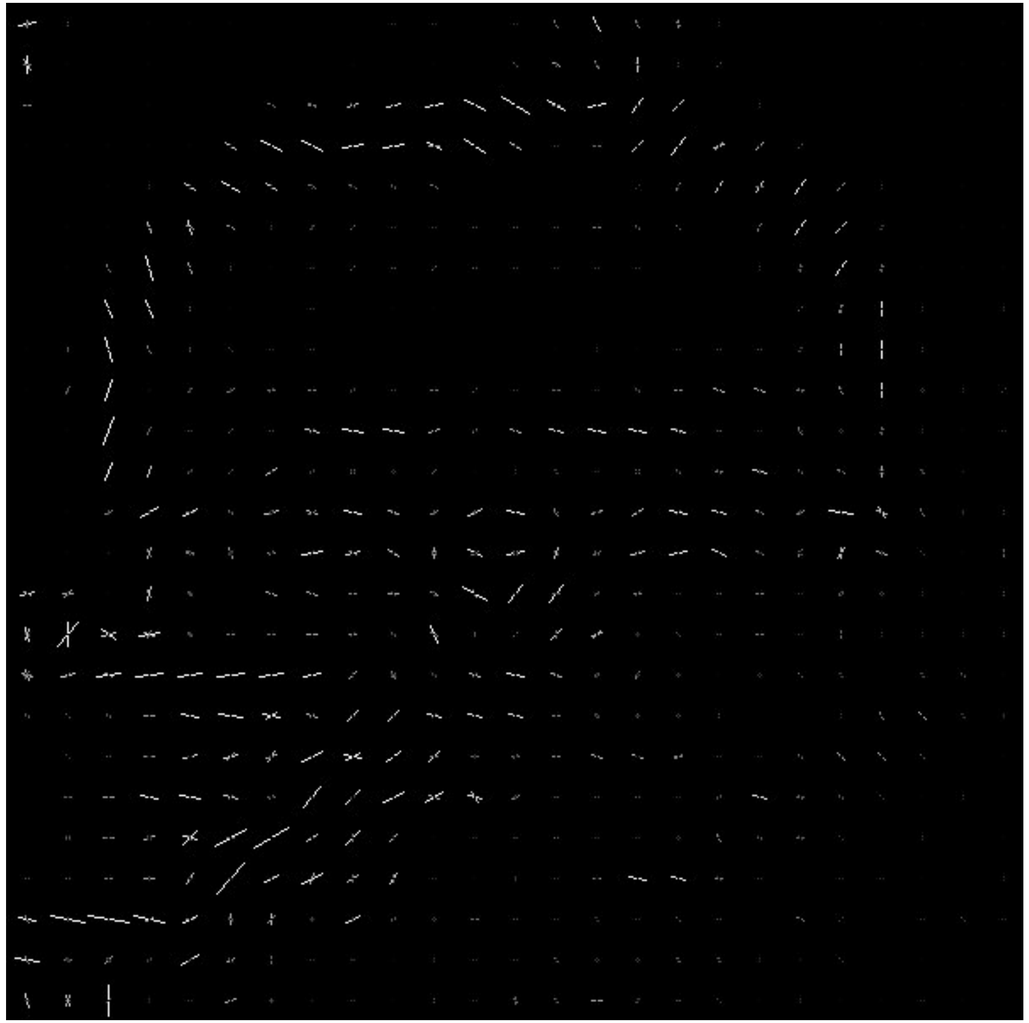


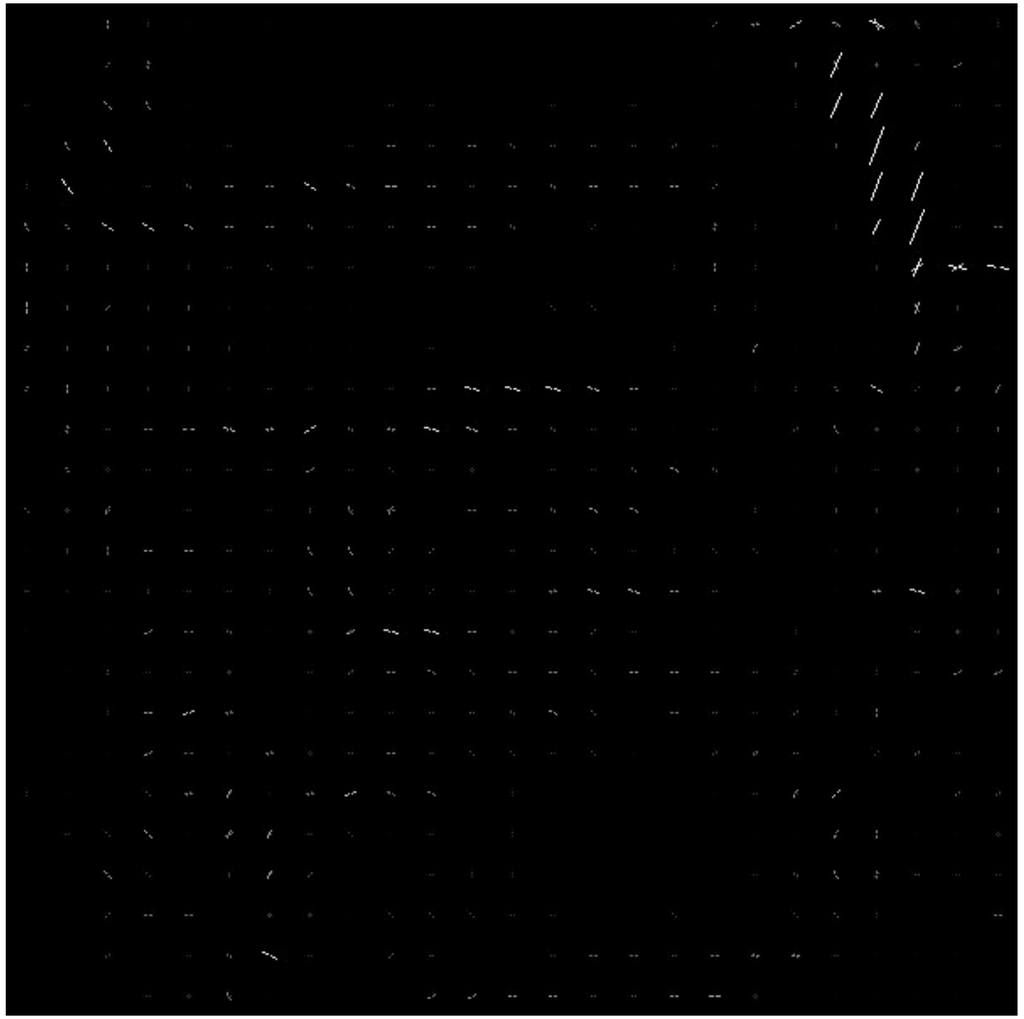
Stage 2ii: Detecting occluded faces

- Attempt 2: Use Histogram Of Gradients (HOG) Descriptors. These look for finding gradients in images (edges with directions). They are then fed into a Support Vector Machine (SVM) to analyse the results.

- Ongoing







Next steps

- Detecting posture
- Machine learning
- User studies
- Evaluation