

# In Contact

## CV Project

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# Problem



Pandemic situation

A lot video calls

Feeling of closed or  
semi-closed eyes during  
the conversation

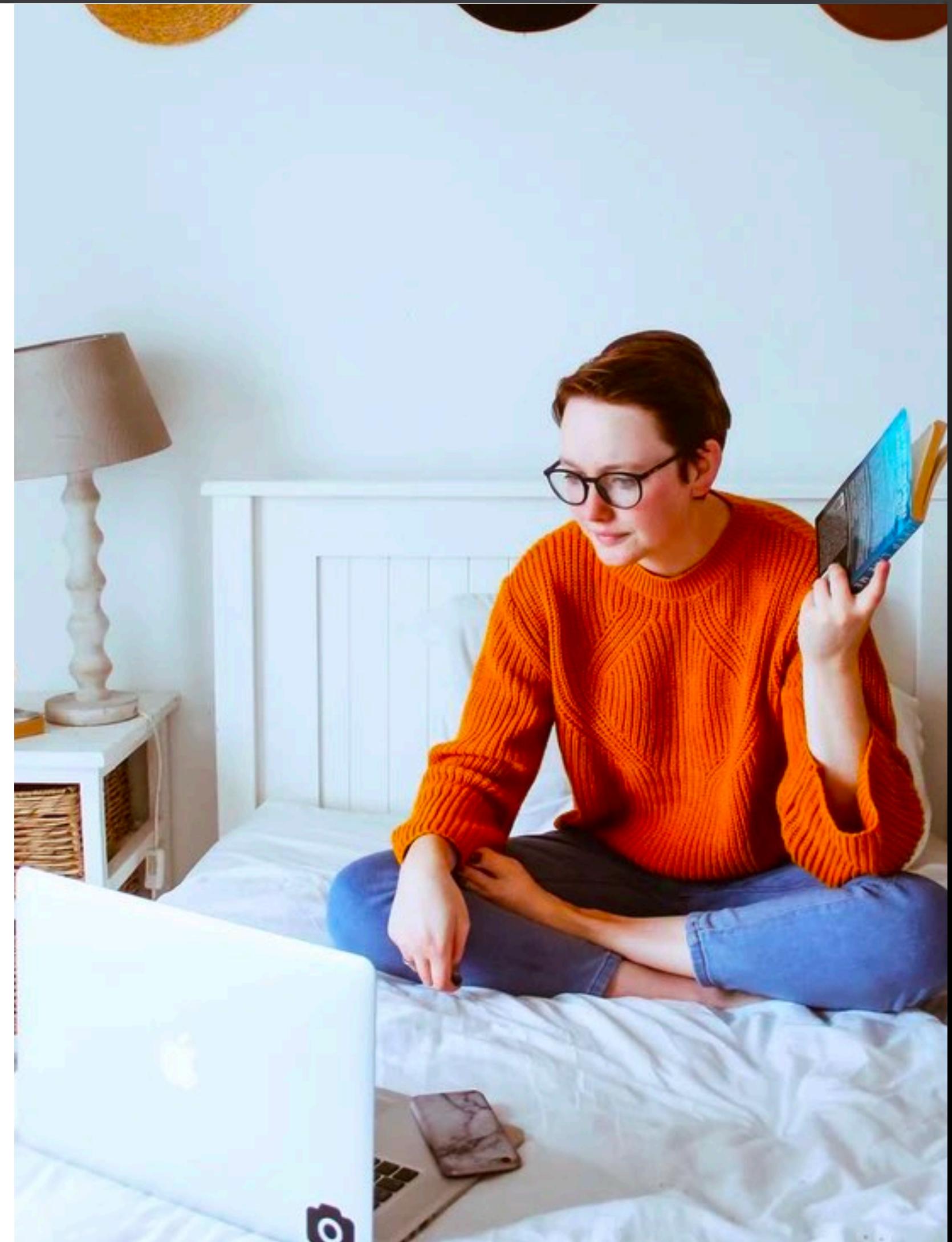


# Total idea

Eyes modification during  
the video calls

## Expected result:

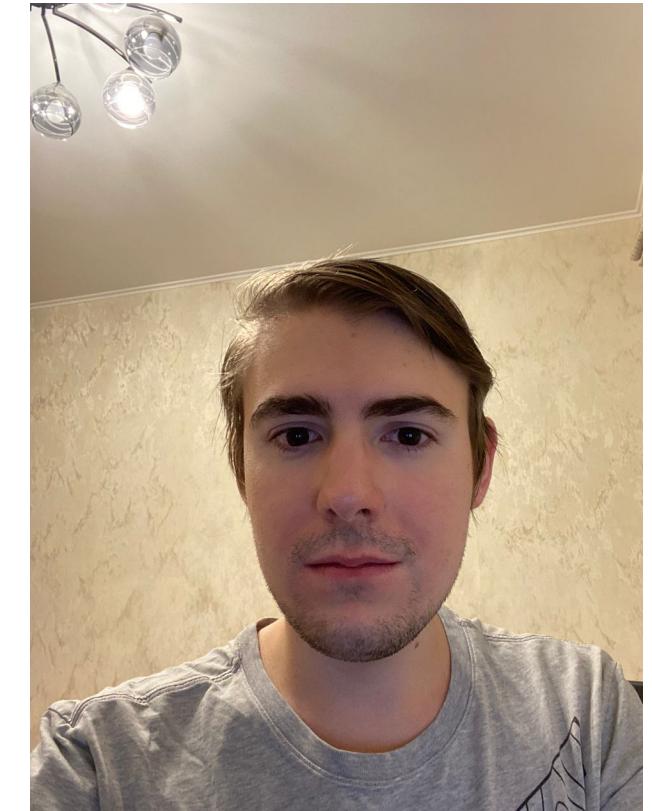
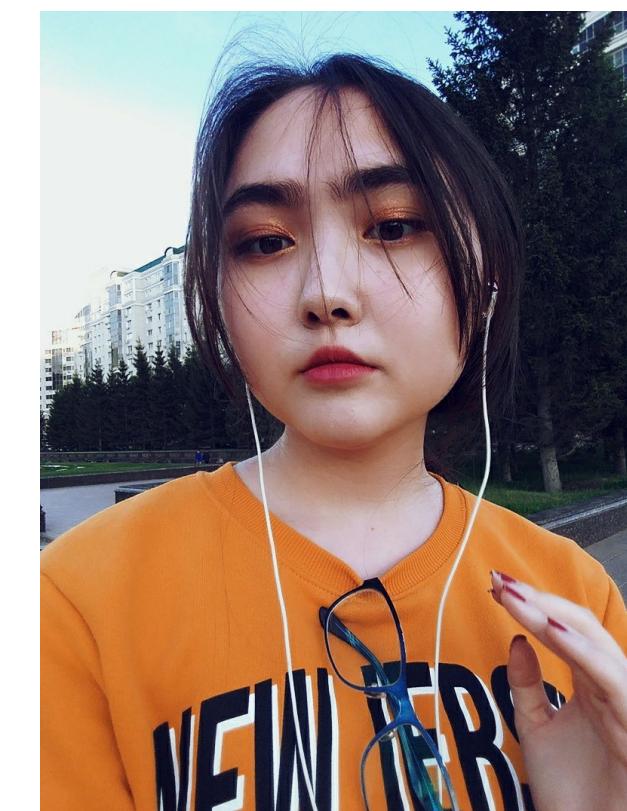
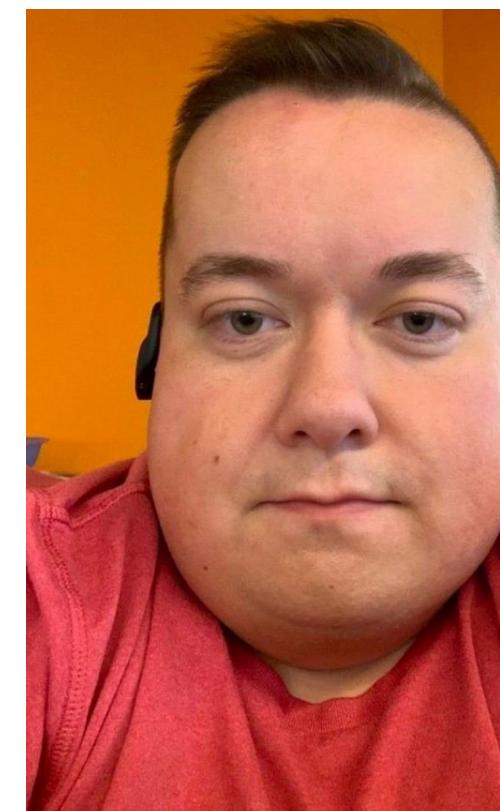
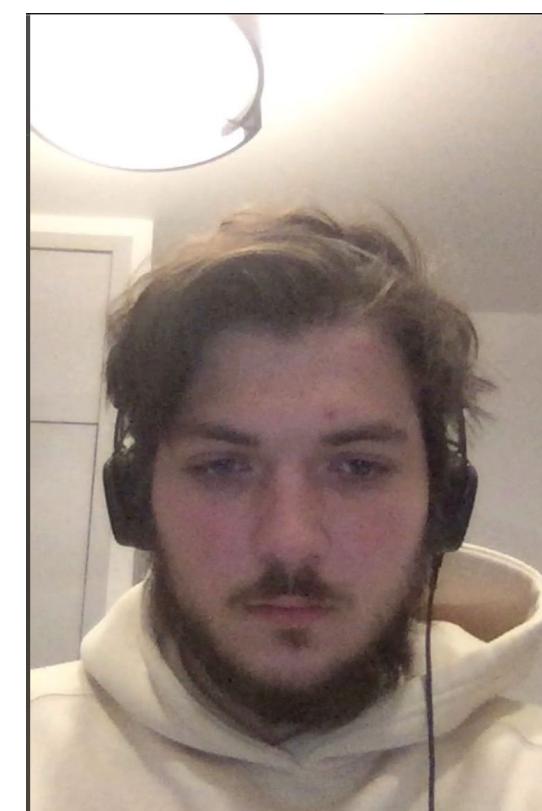
- ✓ Opened eyes
- ✓ Turning gaze to the camera
- ✓ Correcting any gaze



# Dataset

## Selfies

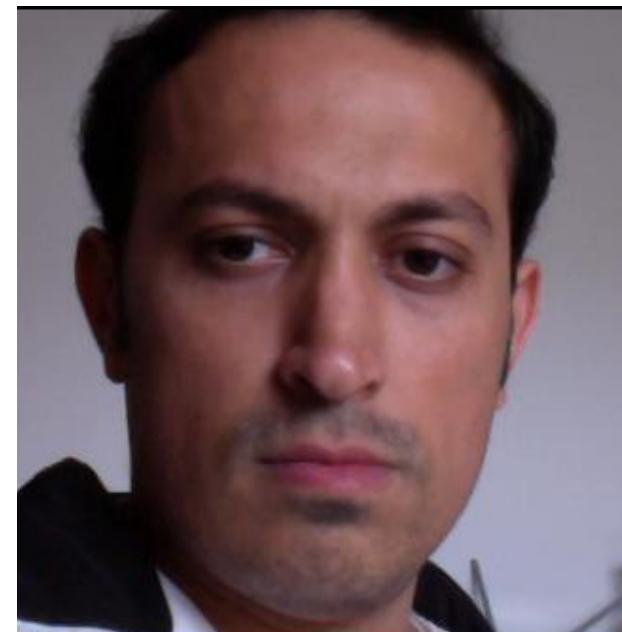
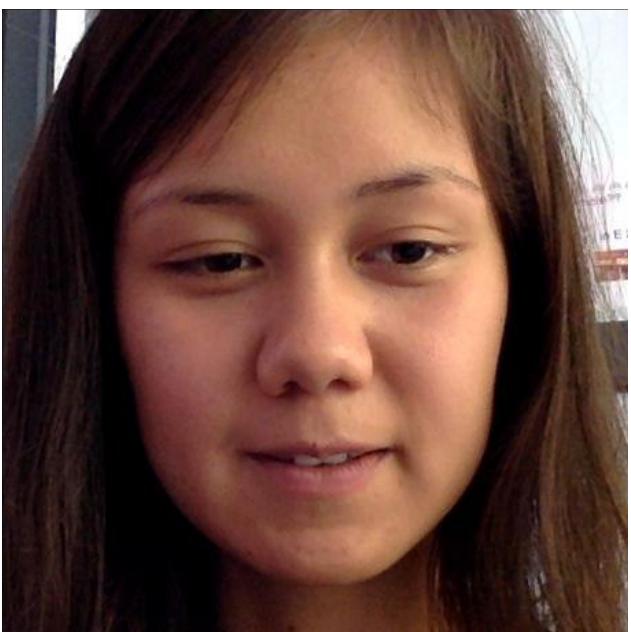
- ✓ with a glance down
- ✓ with eyes closed
- ✓ with squinted eyes
- ✓ with a glance away



# Dataset for model

## Mobile FaceGaze

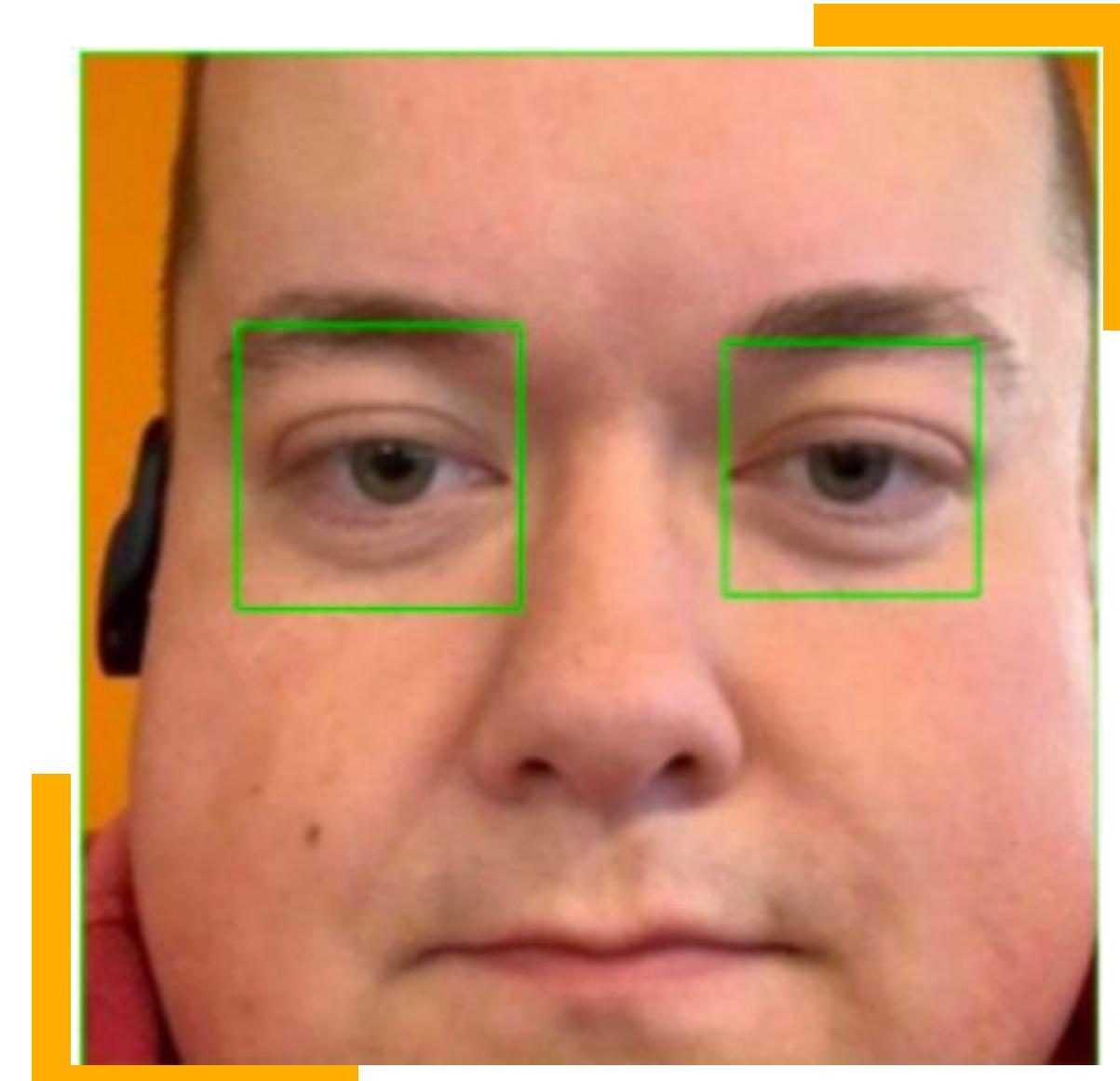
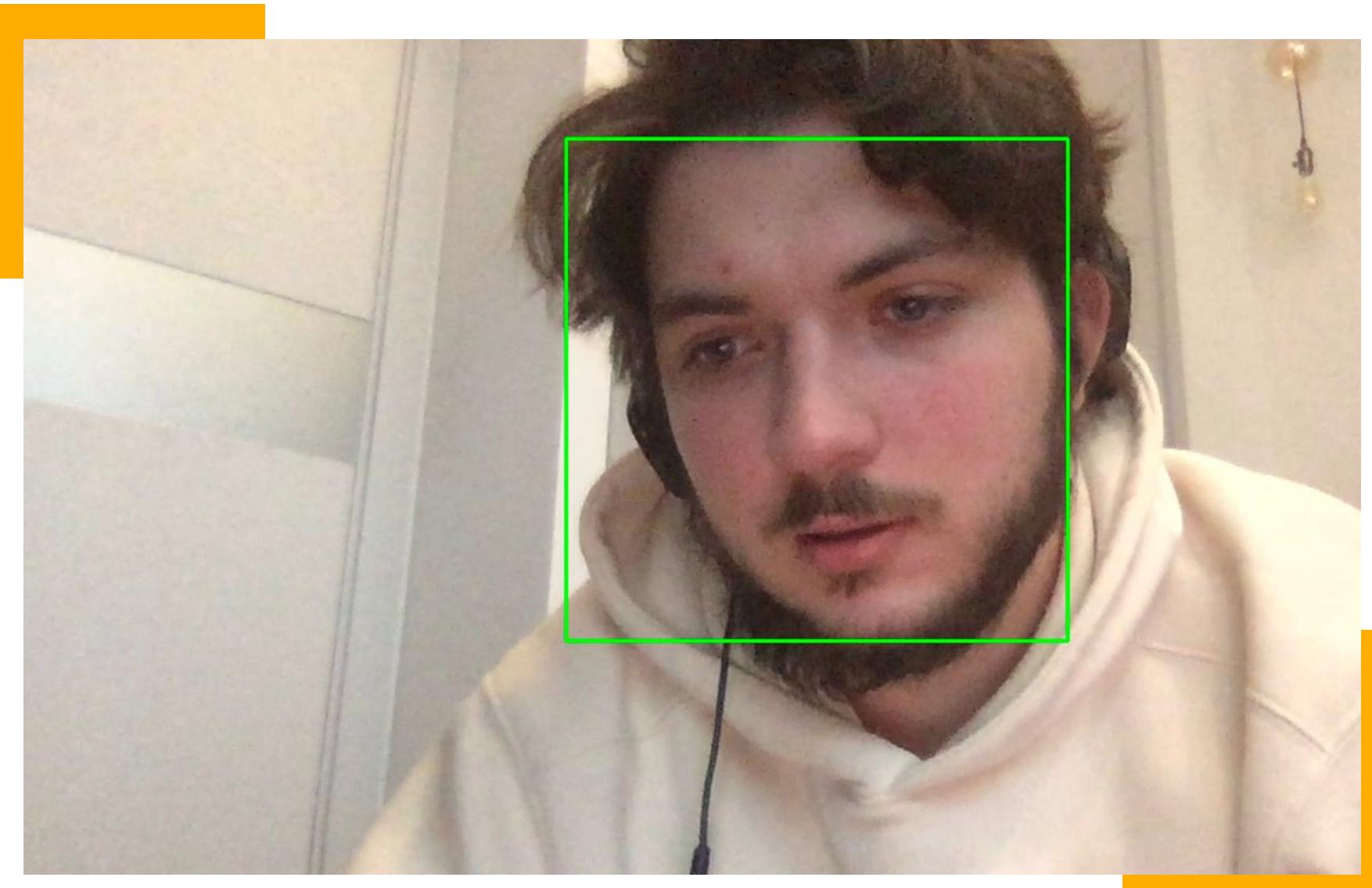
- ✓ with various directions
- ✓ with different eyes
- ✓ with different nationalities
- ✓ with a glance away



# Pipeline

- ✓ Detect face
- ✓ Detect eye area

```
cv2.CascadeClassifier(  
    cv2.data.haarcascades)
```



# Pipeline

- ✓ Finding a symmetry point between the eyes

Geometrical transformations

- ✓ Finding a gaze direction vector

GazeNet



[Video]



# Pipeline

✓ Shift calculation

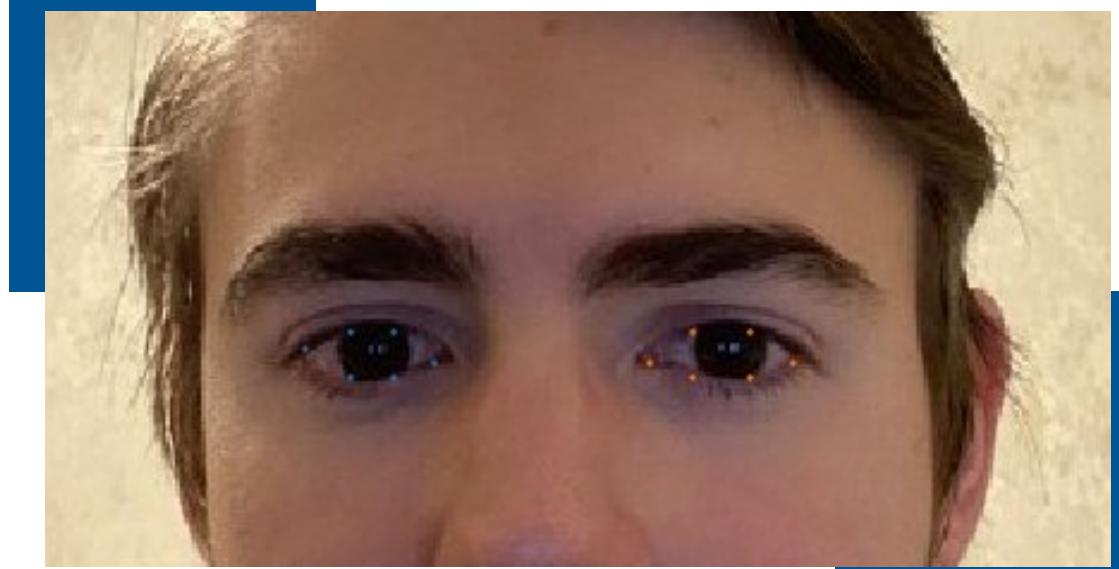
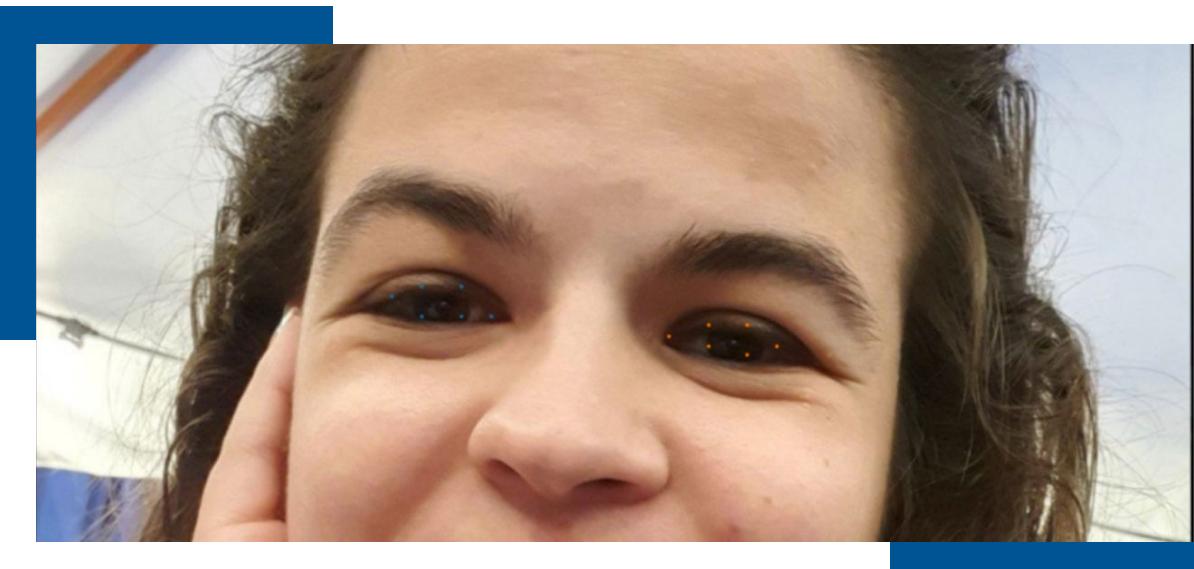
Geometrical transformations  
GazeNet

✓ Get face key points

FaceAlignment

✓ Get the coordinates of the eye

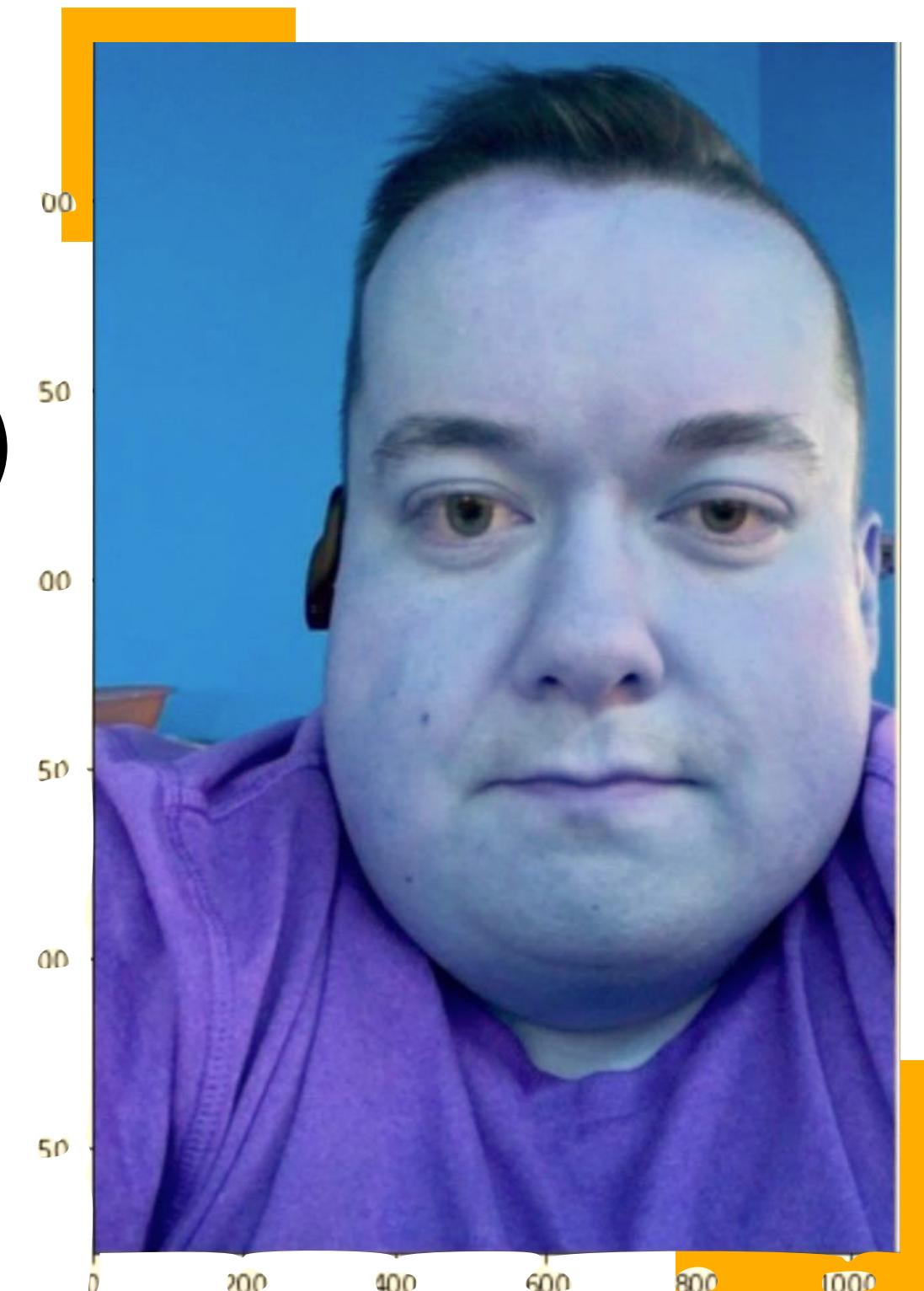
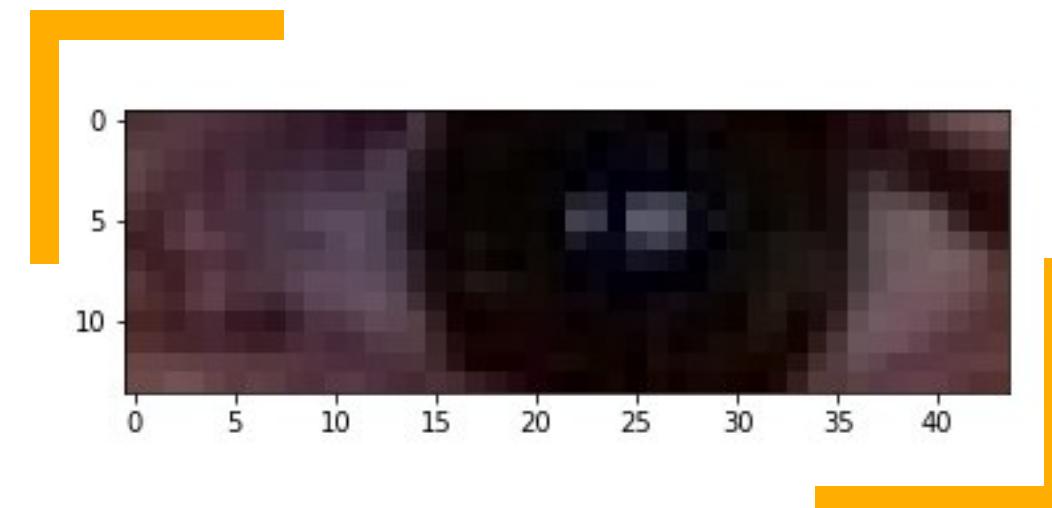
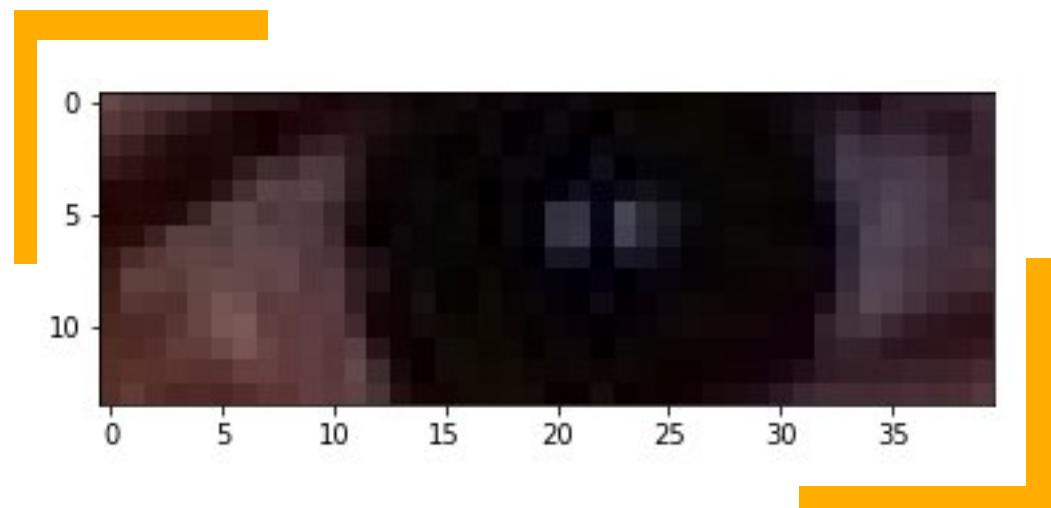
Simple Transformations



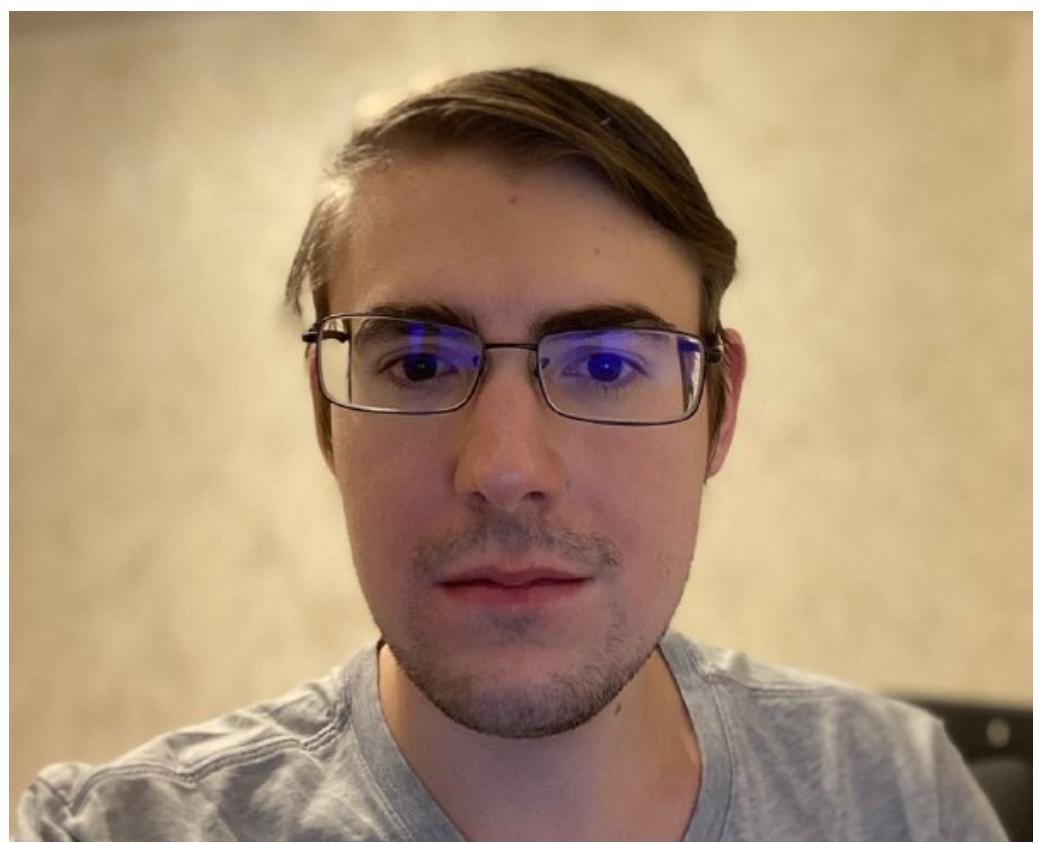
# Pipeline

- ✓ Cut out the left and right eyes
- ✓ Apply compression and stretching  
(according to the direction vectors found)

## ReMap



# Results



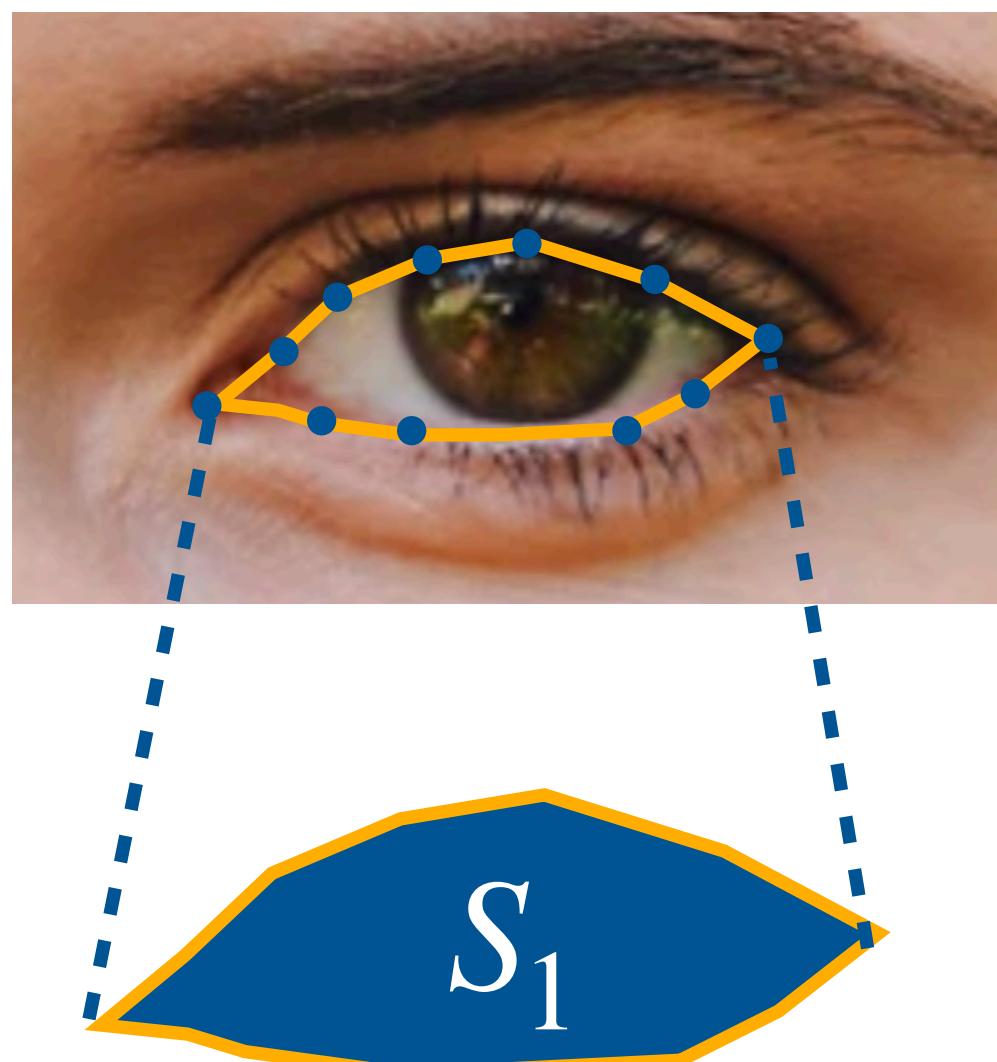
[Video]



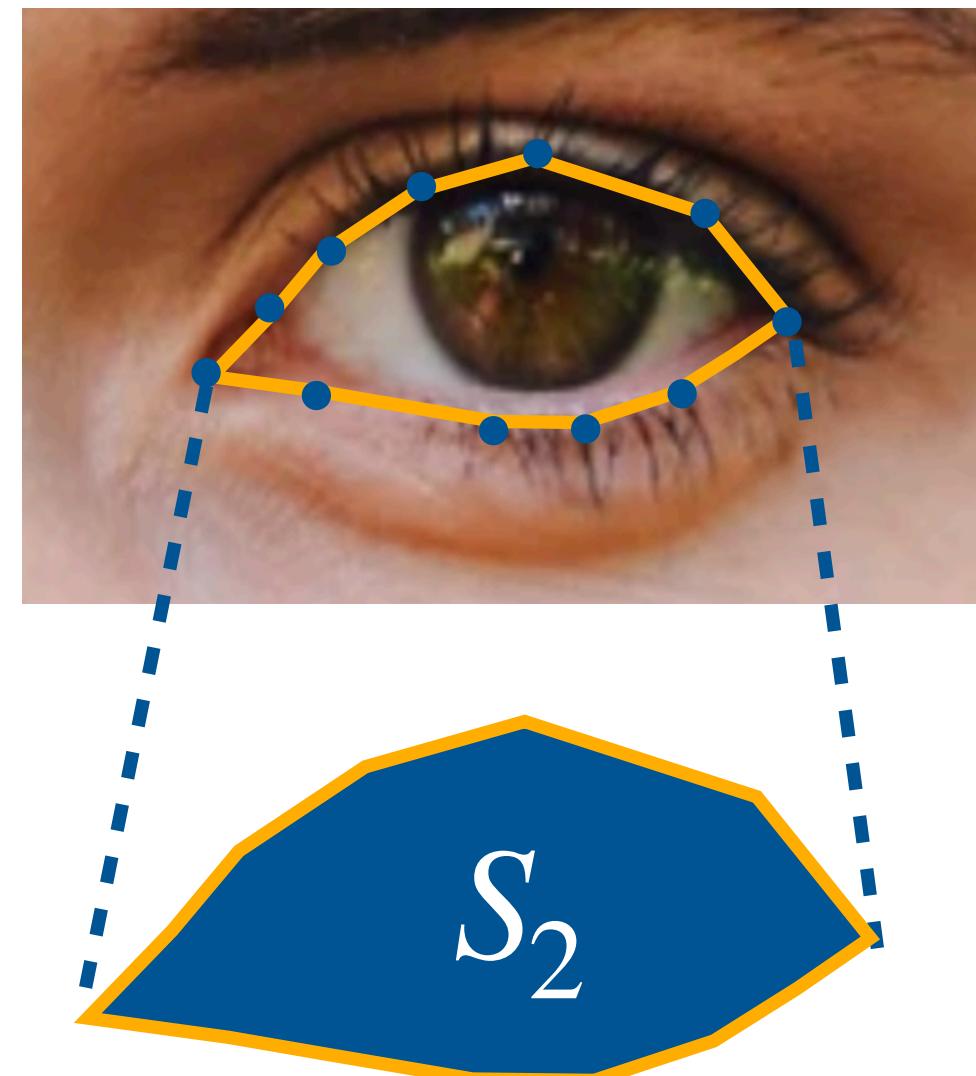
# Metric

Idea of metric is a comparison  $S_1$  and  $S_2$  aimed to identify if the eye've got bigger

Original photo



Transformed photo

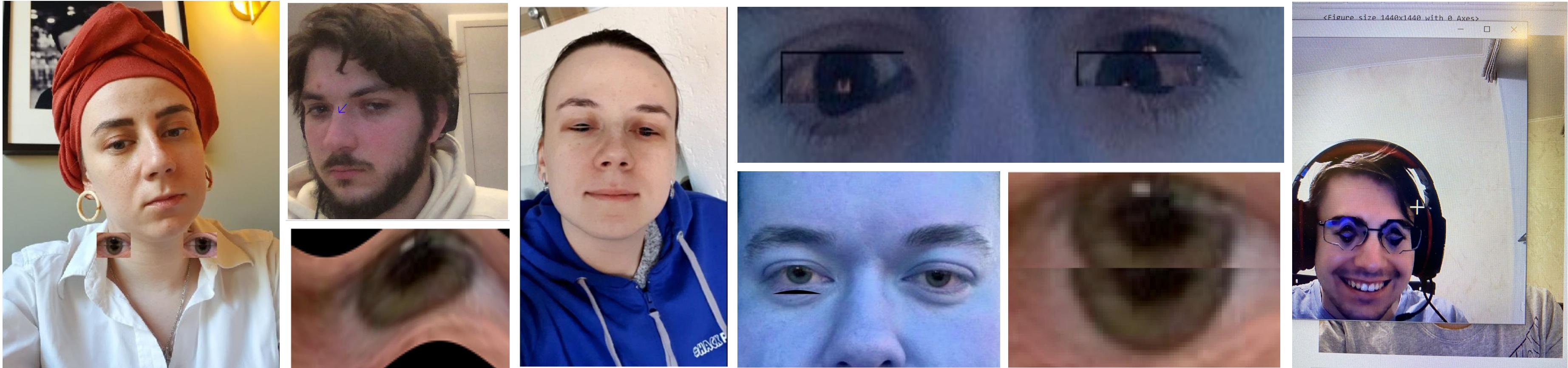


## Success Criteria

- ✓  $S_1 < S_2$
- ✓  $S_2 \leq S_1 * 150\%$



# Fails



Solved

- ✓ Rejecting the idea of eye flipping
- ✓ The decision to curve the picture not only upwards but also downwards
- ✓ Adjust the parameter of how much we open our eyes, depending on the position of the pupils relative to the center of the eye



# Conclusion

## DONE

- ✓ Eye transformation in photos
- ✓ Custom metrics for quality assessment
- ✓ Different angles of work
- ✓ Eye transformation in videos
- ✓ Feature for webcam work

## FEATURE RELEASES

- A sharp turn of the head
- Turning the head at a high angle
- Quality Improvement



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