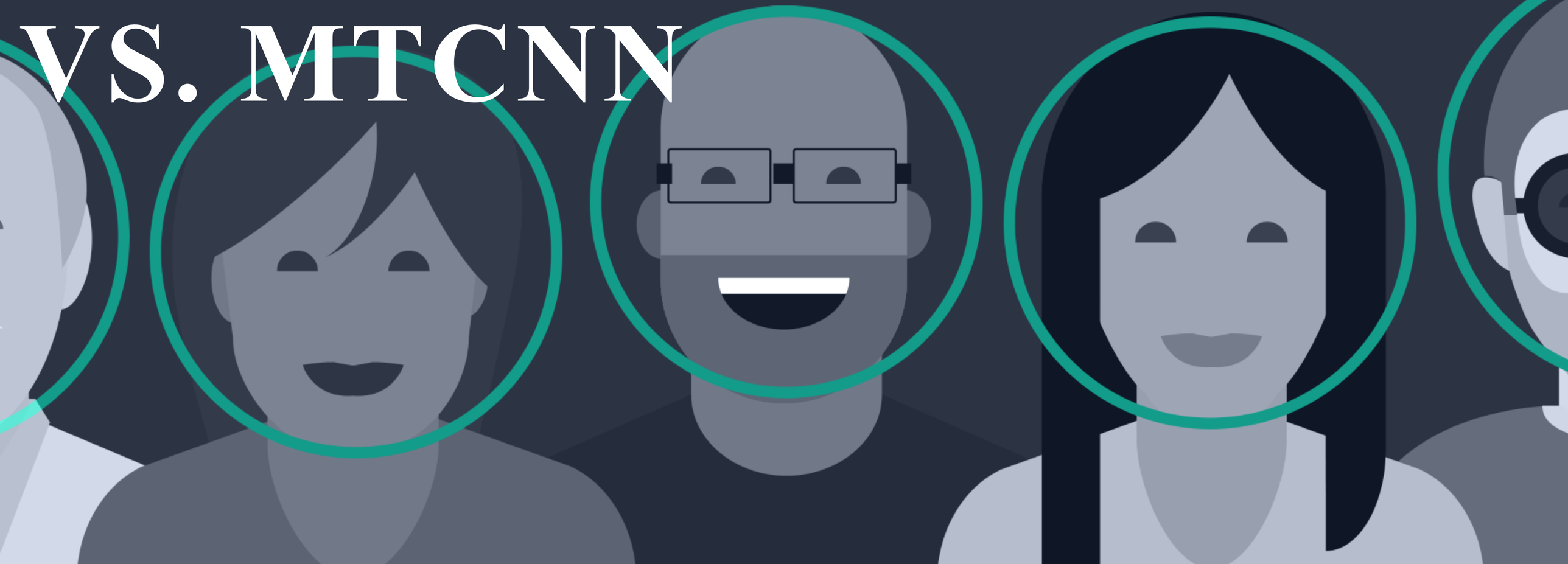
FACE DETECTOR

By: Kirill Demochkin

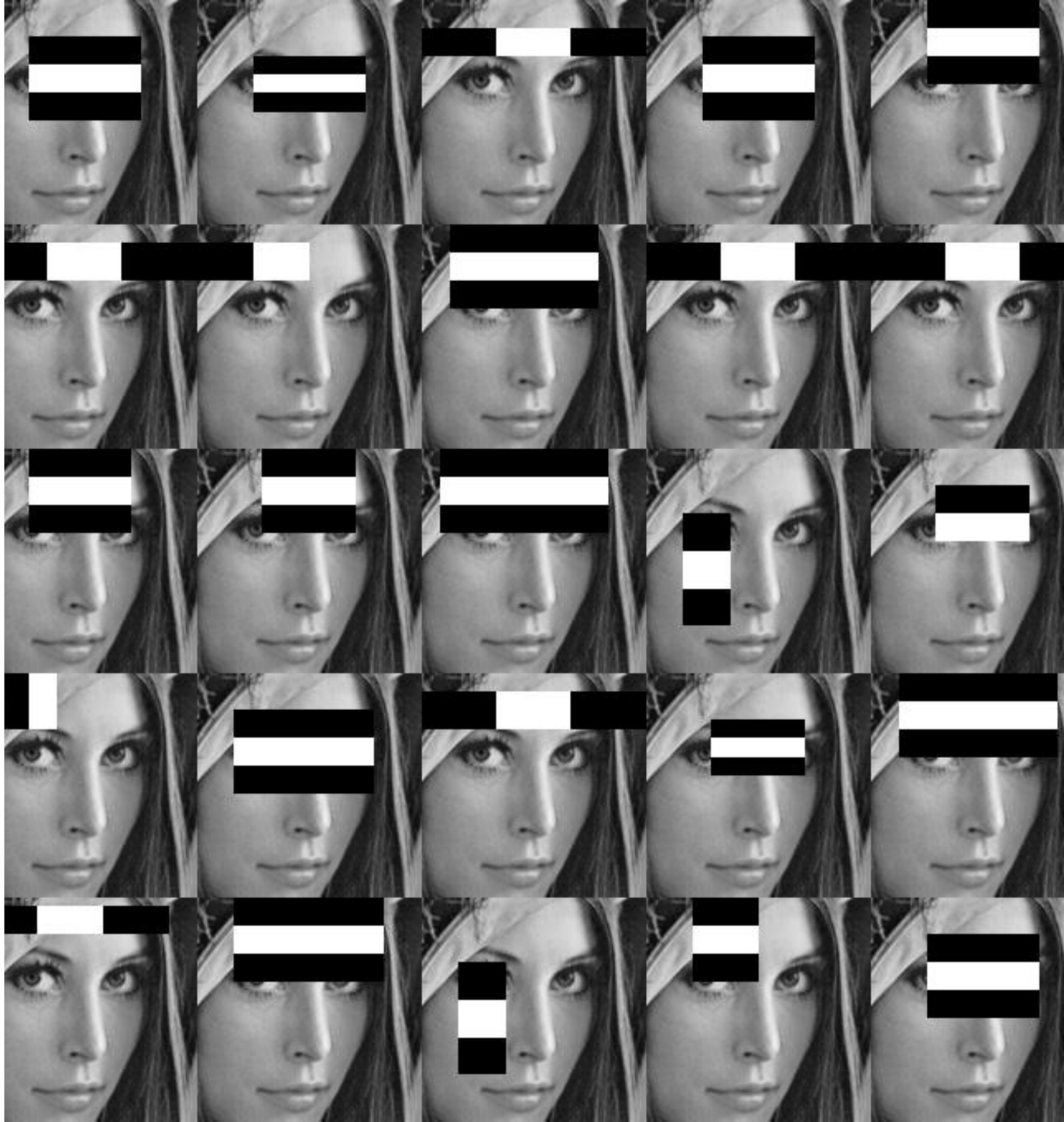
State of the art face detection

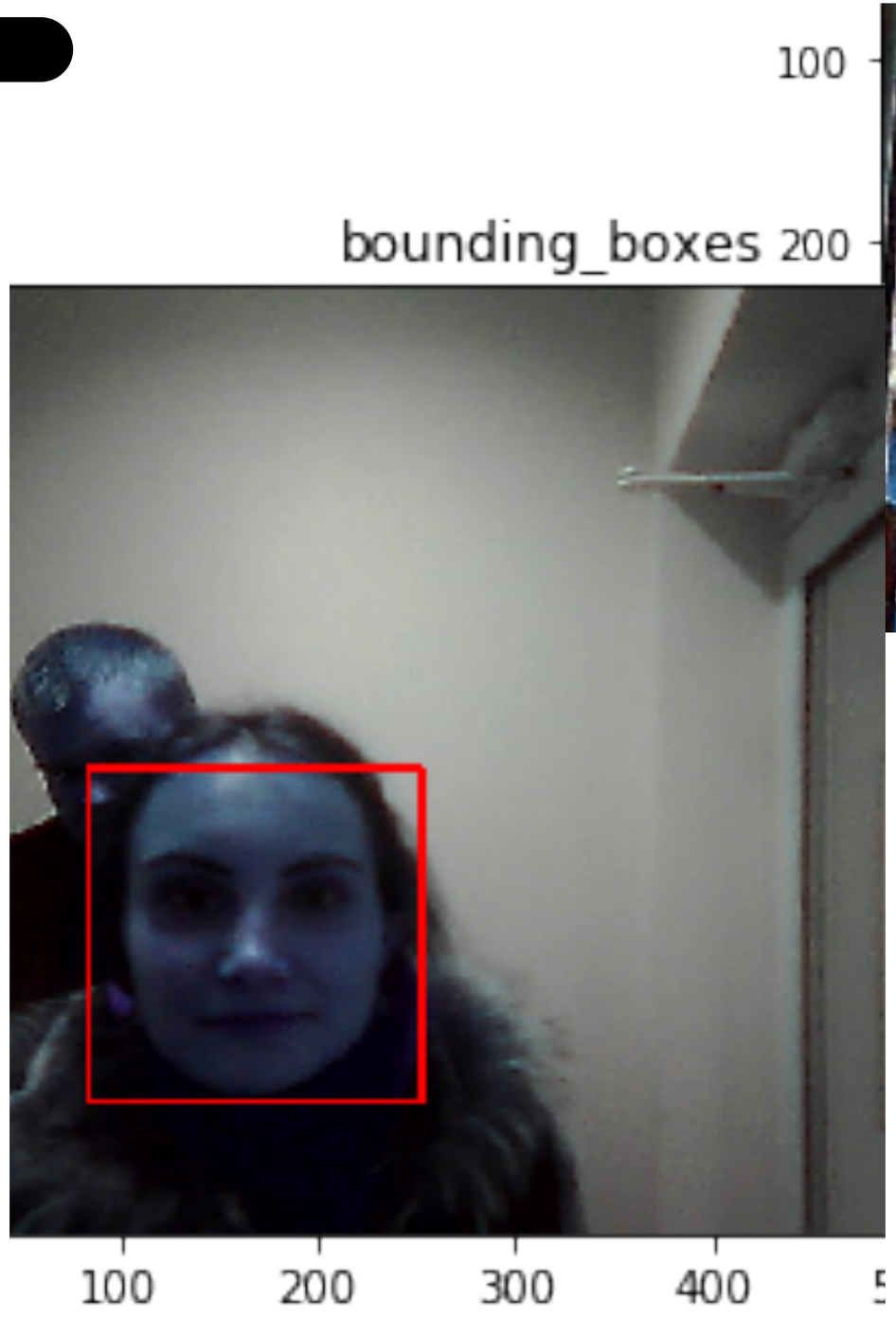
HAAR CASCADE CLASSIFIER VS. MTCNN

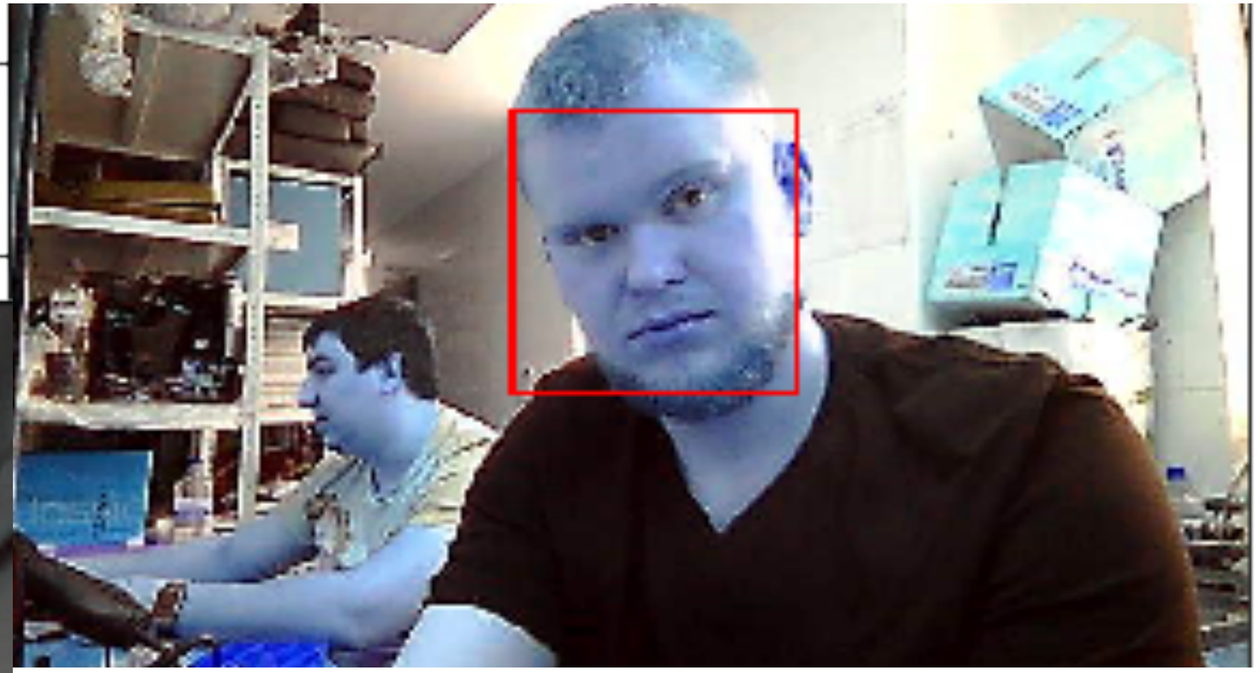


Open CV (HAAR FEATURES)

- Hand engineered
- Work best for frontal face detection
- Unable to work with edge or contour features



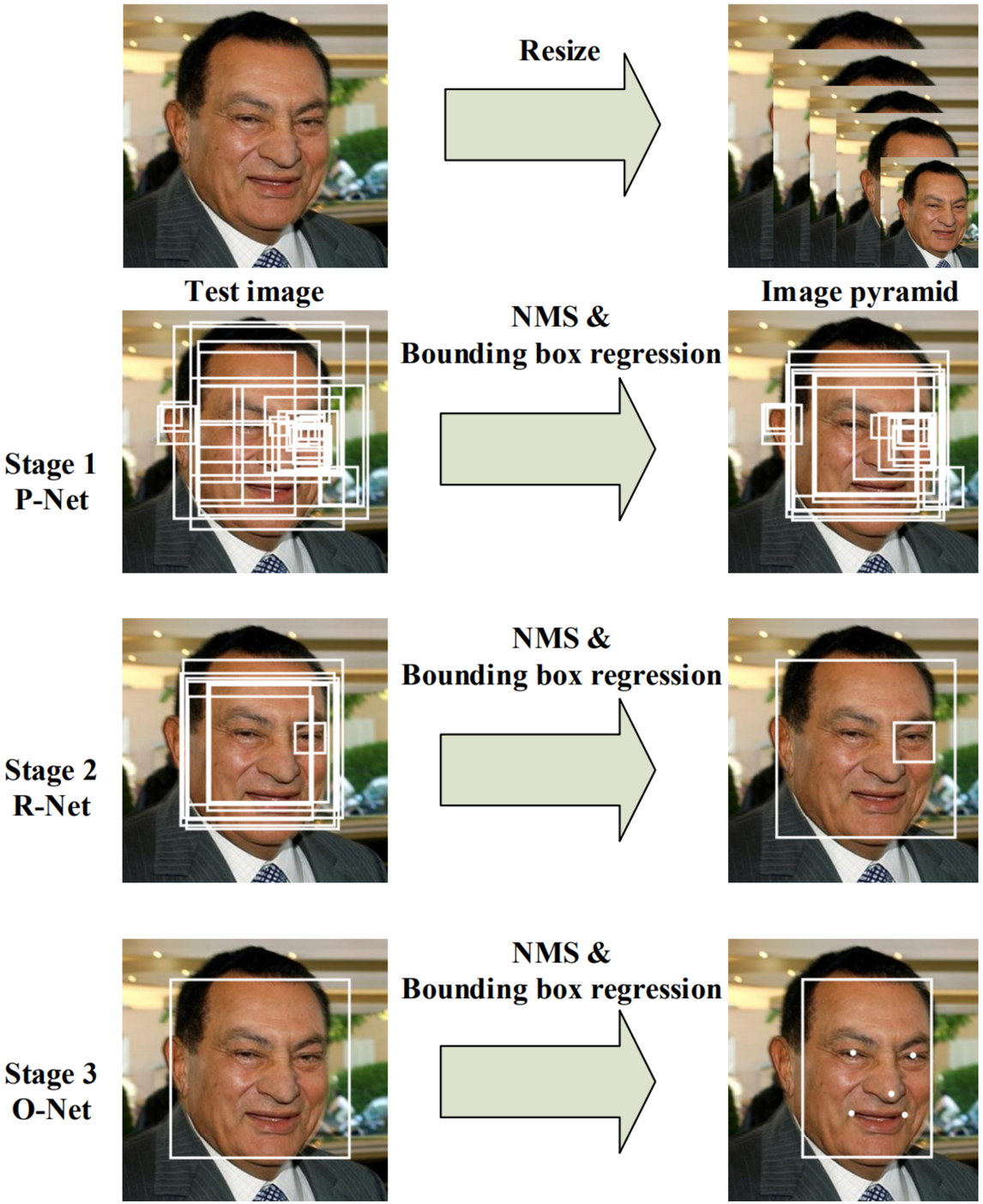




Test results for OpenCV

haarcascade_frontalface_alt2

- Fails to find profiles
- Troubles with partially occluded faces
- Many False Positives



MTCNN (Kaipeng Zhang et al.)

MULTI TASK CASCADING NEURAL NETWORK

Pros:

- Features are learned
- Very adaptive
- Does well with partial occlusion
- Does well with both profile and frontal face detection

Cons:

- Training Process is tedious
- More computationally expensive
- Need lots of data for effective training

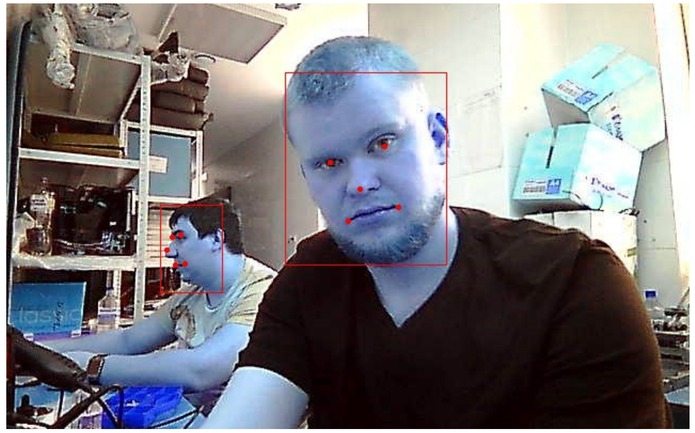
FaceNet

https://github.com/davidsandberg/facenet

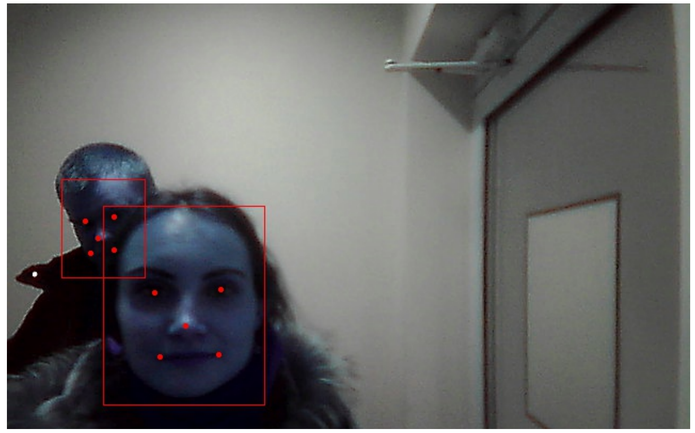
- Provides an implementation of MTCNN in python and TF
- Has an MTCNN model pretrained presumably on the WIDER FACE dataset
- Internally uses MTCNN to align faces for face recognition

Putting it all together

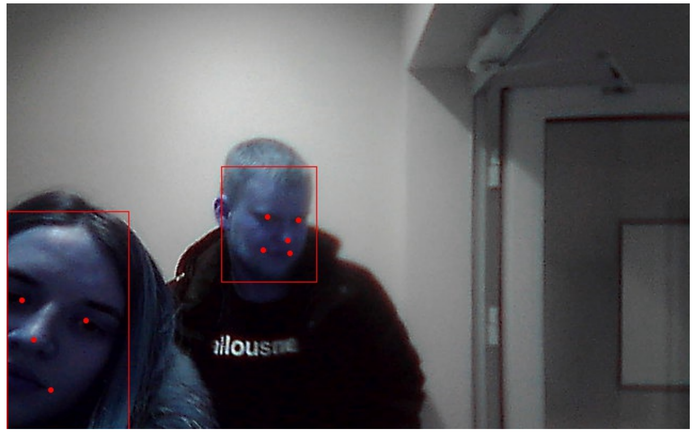
Test results



Profile faces



Partial occlusions

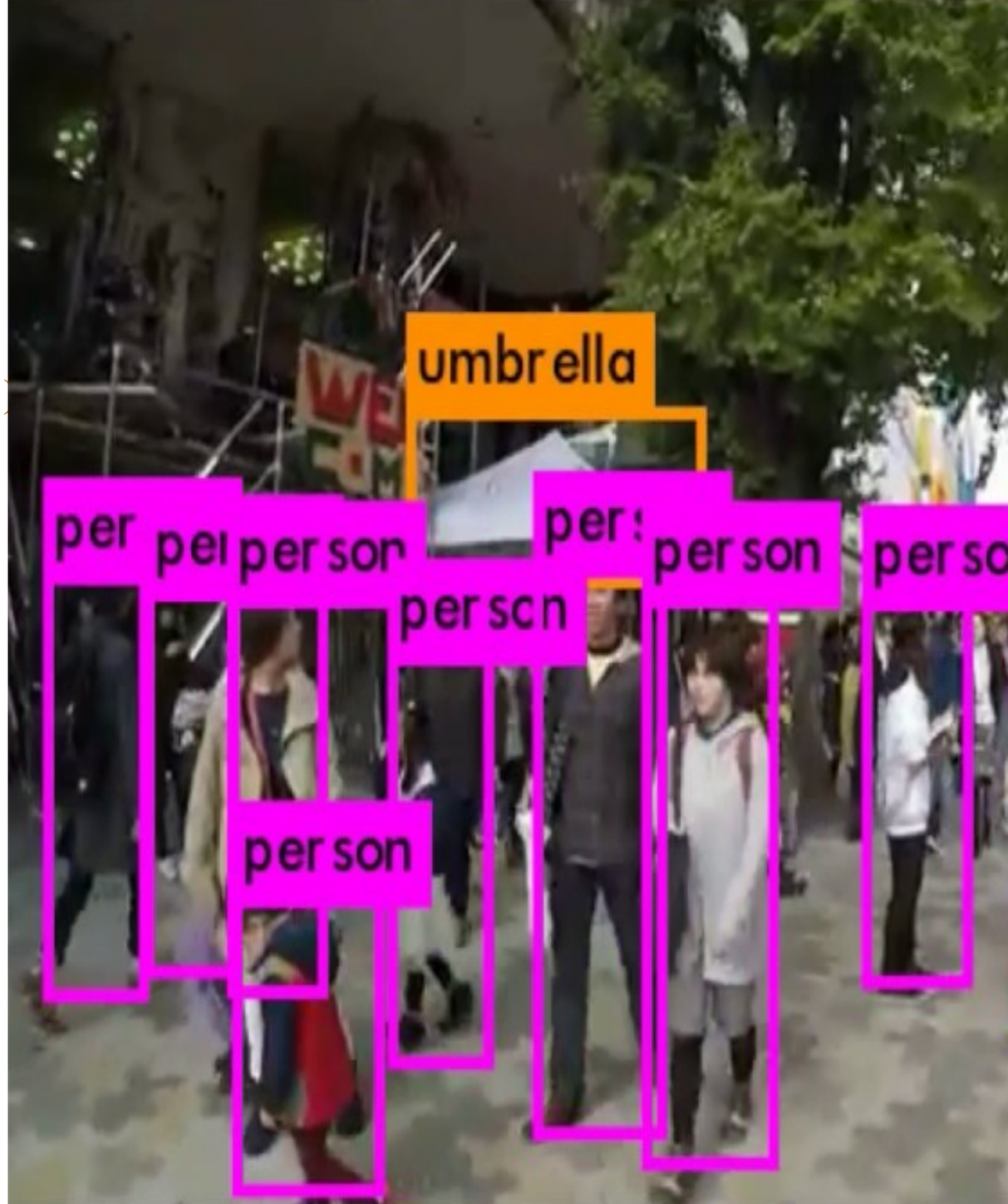


Angles

What's next?

YOLO (https://pjreddie.com/darknet/yolo/)

- Real time object detection
- Written in darknet
- Prioritizes speed over accuracy
- One shot learning



Thank you for your time!

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