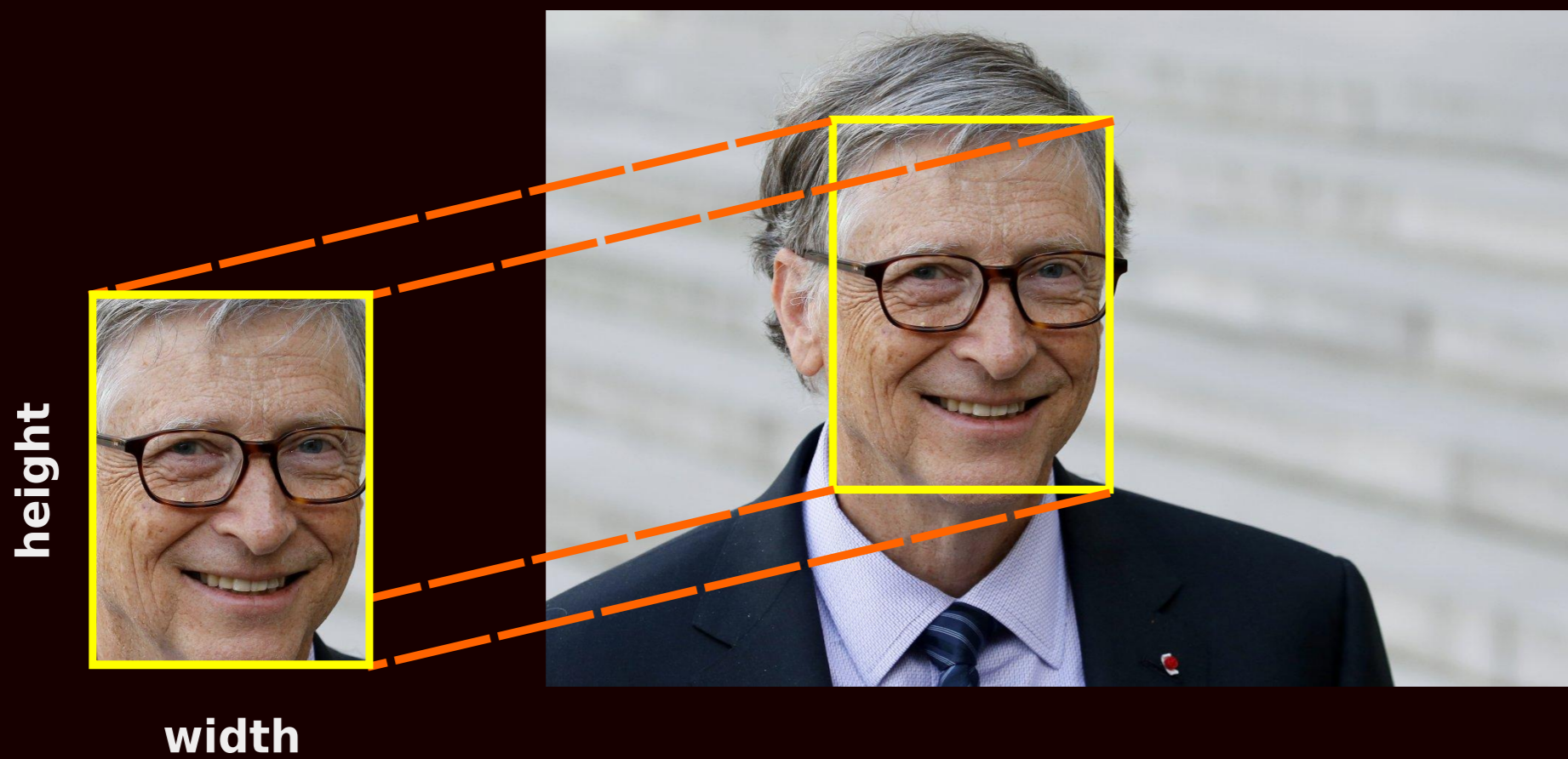


Goal: Lightweight modular classification of several human traits from image data by using several convolutional neural networks. Capable of live inference to take advantage of temporal information to improve age estimation.



Face detection

Face detection CNN called RetinaFace is architecture based on RetinaNet architecture. It detects face in bounding box along with 5 facial landmarks.

Uses multi-task loss function, which takes into account face alignment, pixel-wise face parsing and 3D dense correspondence regression.

Gender

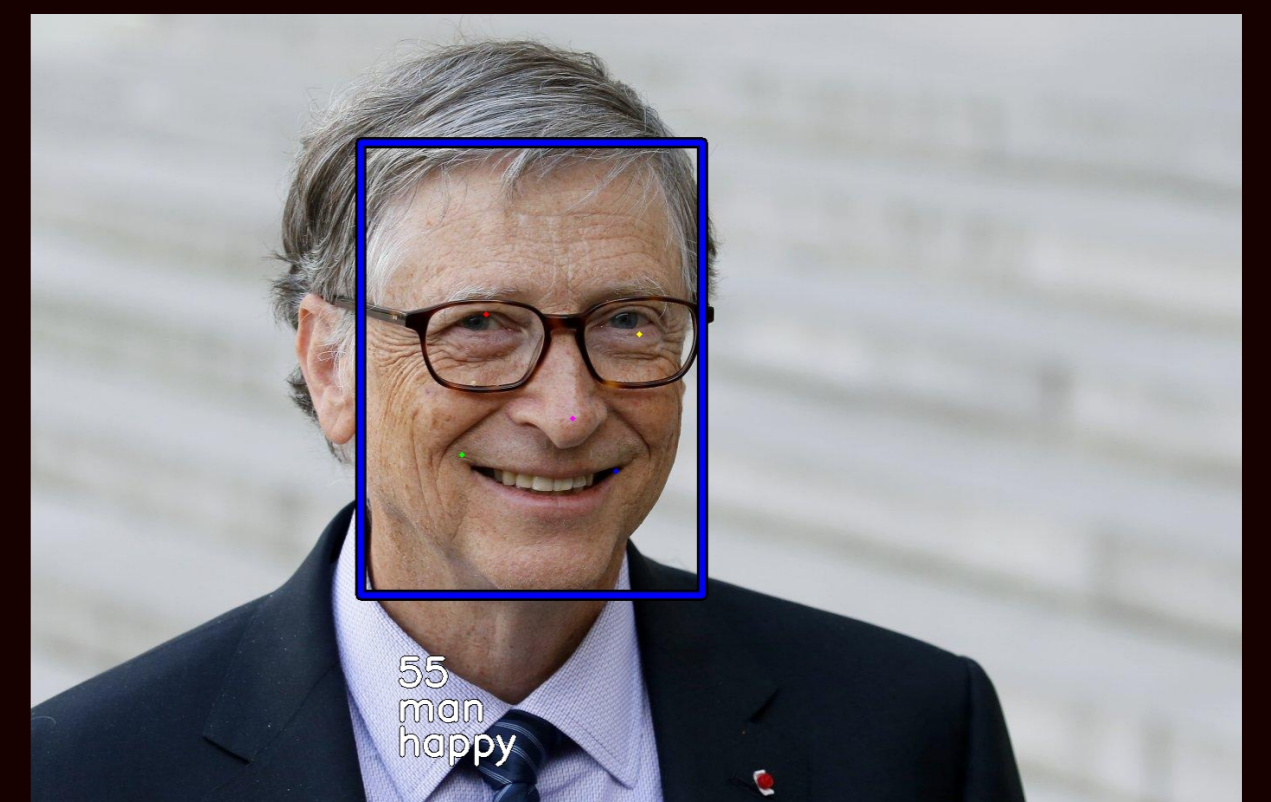
Binary class CNN architecture classifying into labels: woman and man

Emotion

Multiple class CNN architecture classifying into labels: angry, disgust, happy, sad, surprise and neutral

Output

Face: Detected
Age: 55
Gender: man
Emotion: happy



Age estimation

CORAL: Consistent RANk Logits

A CNN architecture for ordinal regression problems. Age estimation is treated as a set of binary classification tasks. Sum of outputted task predictions equals to predicted age.

Modification with LSTM

Adding 2 LSTM layers between concatenated output of ResNet - 34 and final linear classification layer, lets CORAL improve its age estimation.

New video data set

To train and test LSTM layer new data set is made from videos of people of various ages in range 1-100 years.

Time sequence of single face consists of 20 frames. Sequences act as input to modified CORAL CNN.

