

Problem 3: Gender classification in video: Given a video, detect people (can be faces, heads, clothes, etc.) and label in real time each detected person's gender.

1. The complete source code/implementation folder that can be compiled on a Windows 10 64-bit PC.
2. A video recording that demos how your system works and the features and highlights of your system.
3. Report that contains

• **Methodology/Approach:** how did you solve the problem/project, how did you evaluate the solution and your justification, etc.

A cropped data set (cvlib) of face regions is used for training a smaller VGGnet from scratch on 2200 images containing faces. The training and test was in a ratio of 80:20 %).

Training:

loss: 0.0389 - acc: 0.9844 - val_loss: 0.2358 - val_acc: 0.9416

Our training script output (last epoch in black and white color above) shows that our keras CNN for gender detection has obtained an accuracy of 98.44% on training set and 94.16% on test set. Figure one shows

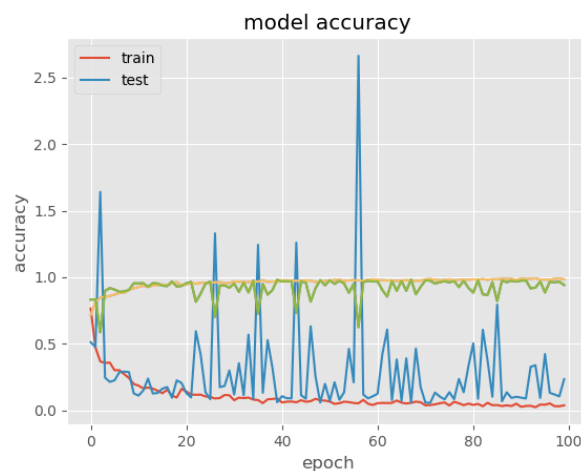


Figure 1 shows the training model accuracy based on training loss, training accuracy and testing loss and testing accuracy. The red line is training loss, blue line is test loss, the yellow line is training accuracy and green line is test accuracy for 100 epochs.

Also clearly mention the libraries/frameworks that you used and which are original parts.

I used Python 3.7 with the following libraries,

Tensorflow, keras, matplotlib, numpy, scikit-learn, opencv-python, cvlib

- Results: may include PR/ROC curves, accuracies, speed (also include the specifications of PC where you measured the speed), confusion matrices.

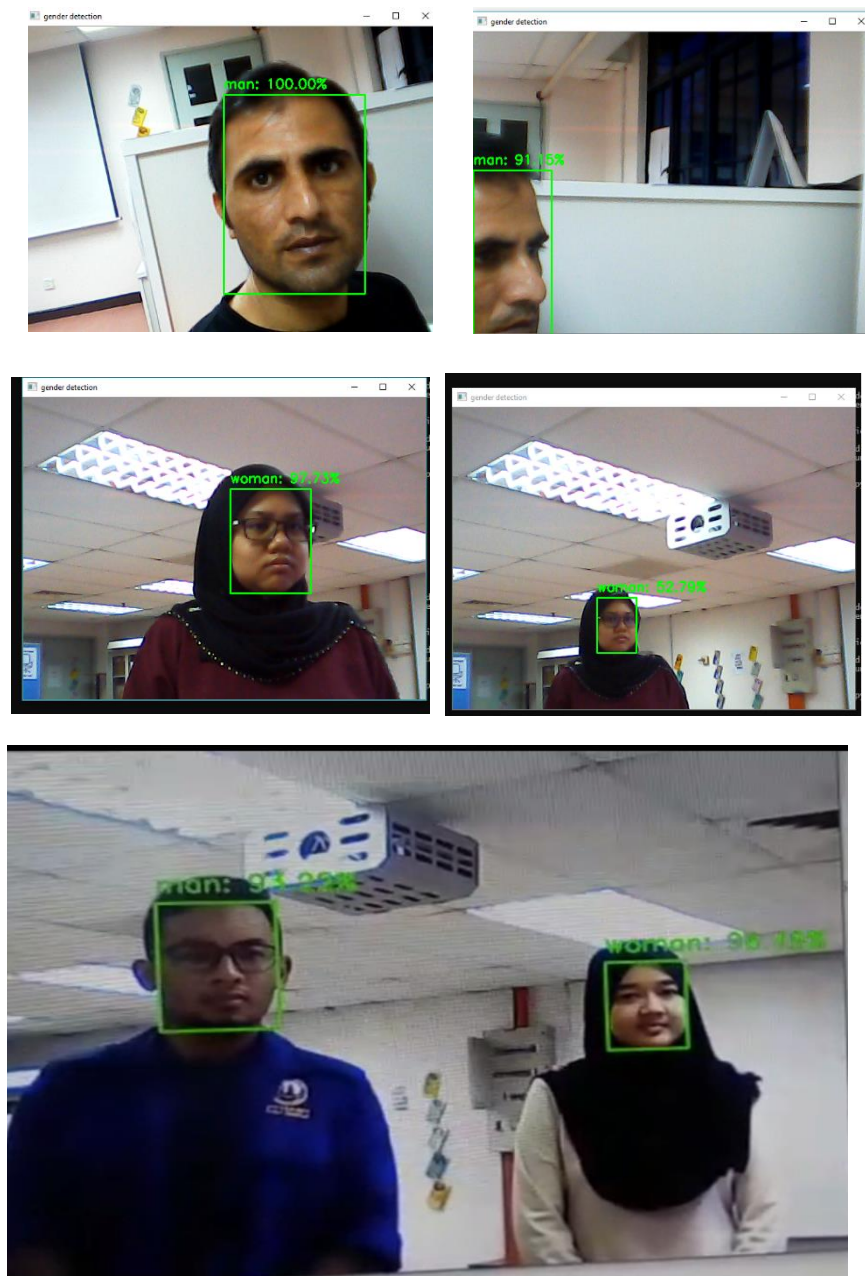


Figure 2: show the detection output of our model

It can be seen from the training as well detection results that our keras model based on smallerVGGnet can easily and fastly detect and classify the gender in different position w.r.t camera.

The accuracy are 98.44% on training set and 94.16% on test set. I got **ROC AUC: 0.903786**

I used Dell XPS with processor Intel core i7 for training and testing the model.

- Discussion: interpretation of results, challenges you faced and how you overcame them, which parts of the project you couldn't solve, etc.

Challenges: I tried to evaluate the model for Confusion Matrix but due to time shortage I couldn't.