

Final Project

Marie Lattelais



Do you know these people?



F.R.I.E.N.D.S

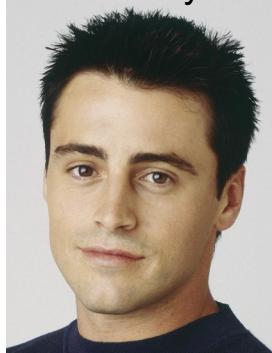
Rachel



Chandler



Joey



Phoebe



Monica

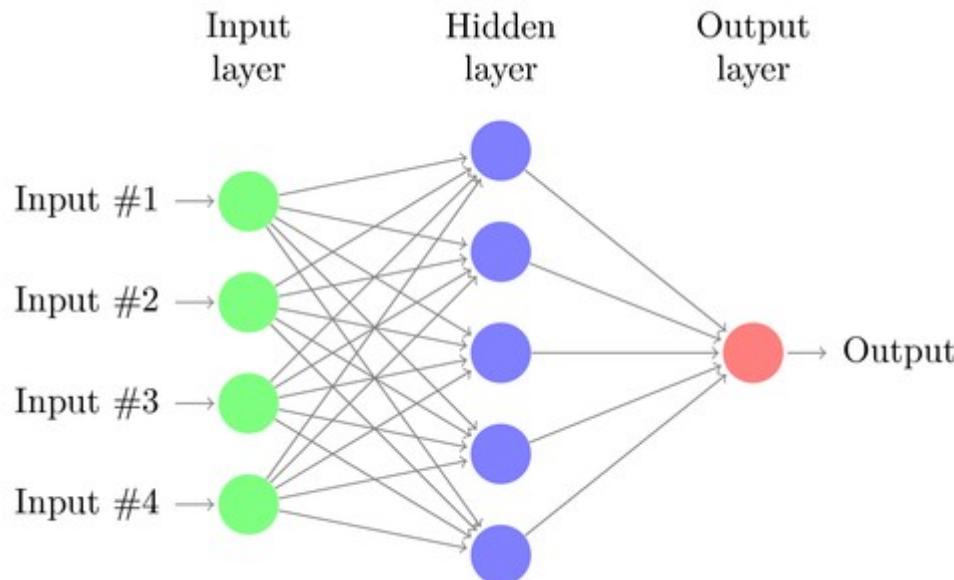


Ross



How can my computer recognize images?

Neural Network (NN)



First Approach: Building and training my NN

1. Prepare data

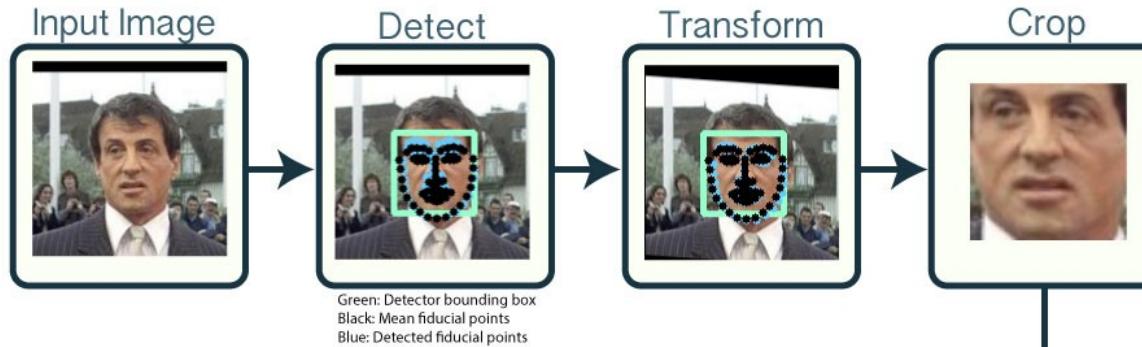
- Needs a big dataset:
 - Web Scraping images on IMDB
(BeautifulSoup)



First Approach: Building and training my NN

1. Prepare data

- Needs a big dataset:
 - Web Scraping images on IMDB
- Find and crop faces
 - Using already trained convolutional NN *(PyTorch, OpenCV)*

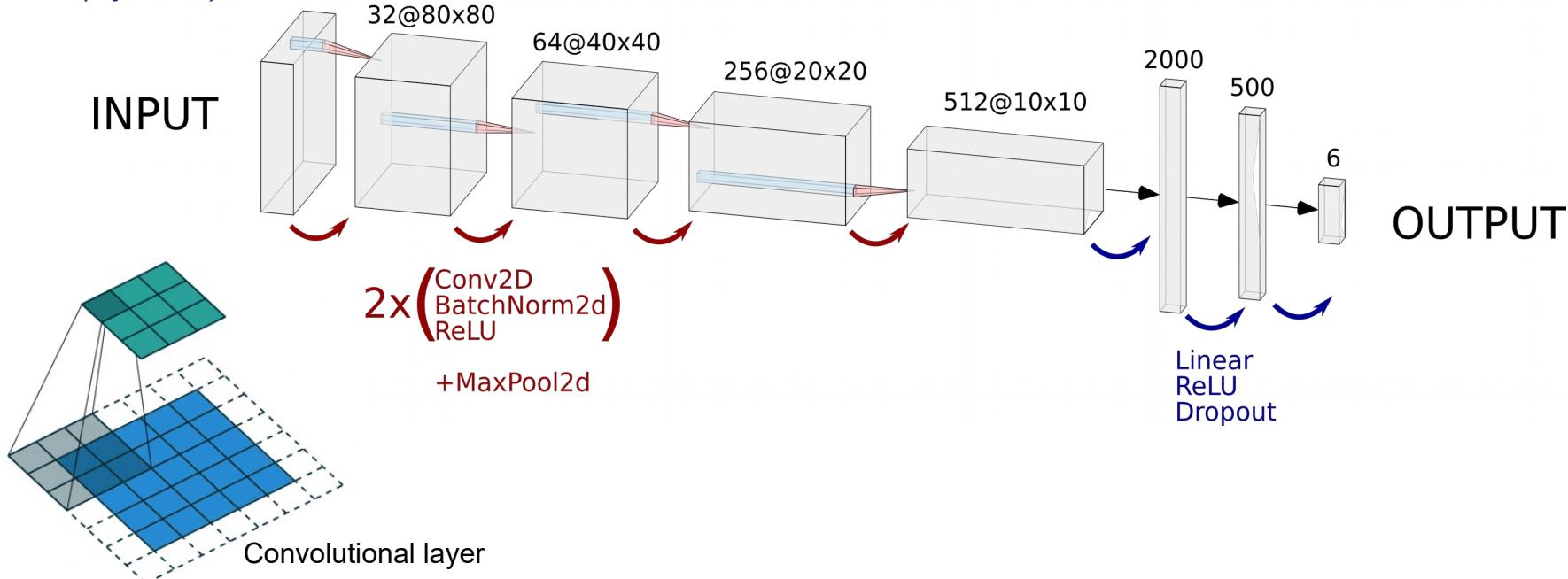


<https://github.com/timesler/facenet-pytorch>

First Approach: Building and training my NN

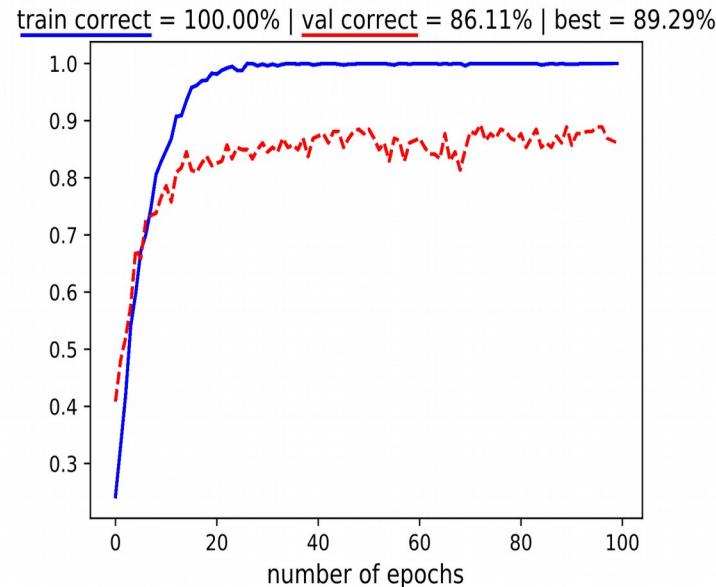
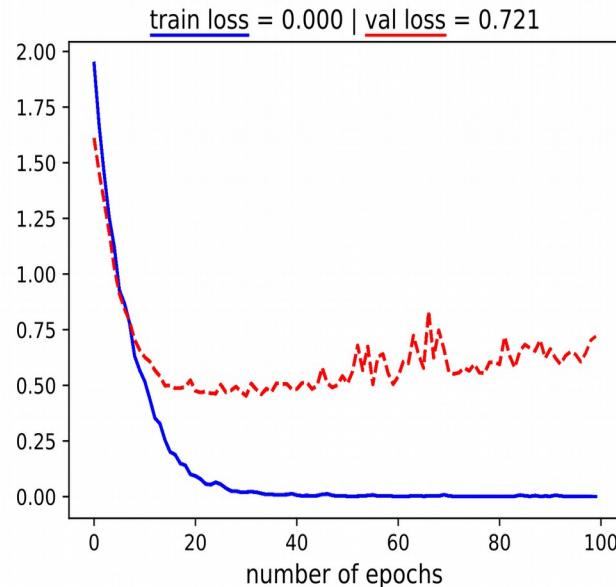
2. Build NN

(PyTorch) 3@160x160



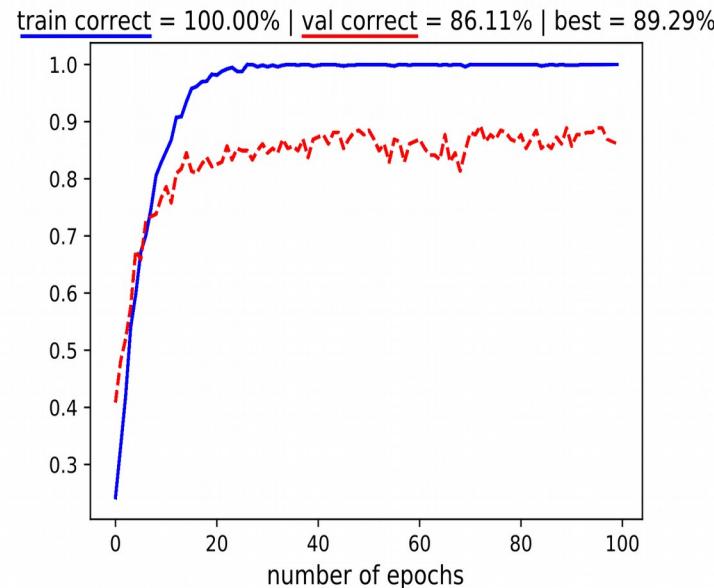
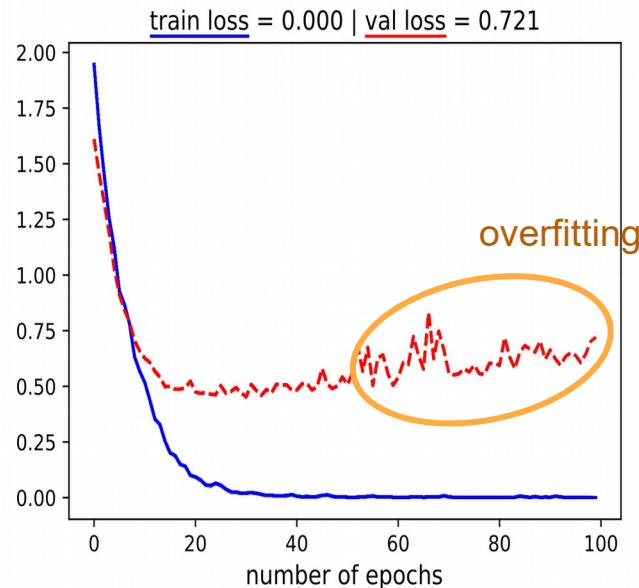
First Approach: Building and training my NN

3. Train NN



First Approach: Building and training my NN

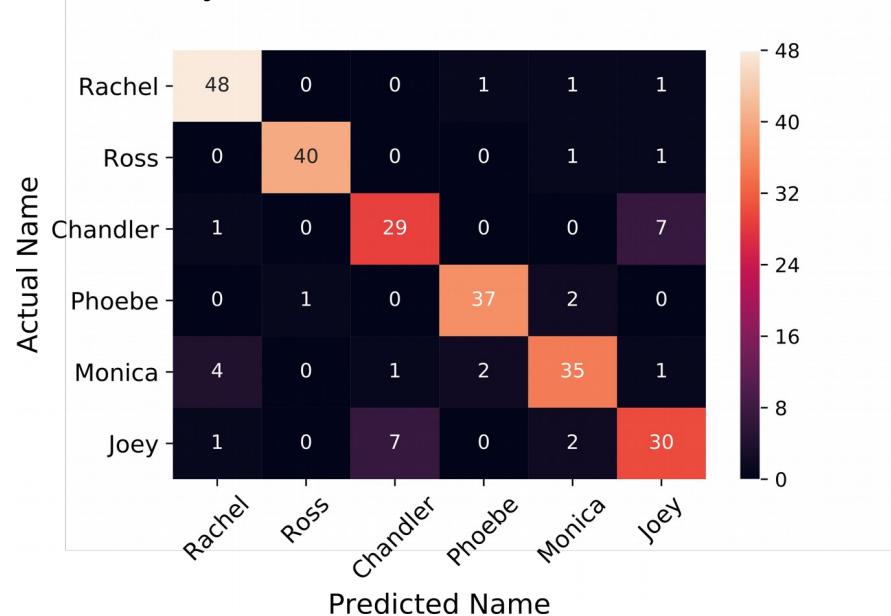
3. Train NN



First Approach: Building and training my NN

4. Evaluate model (*Scikit-Learn, Seaborn*)

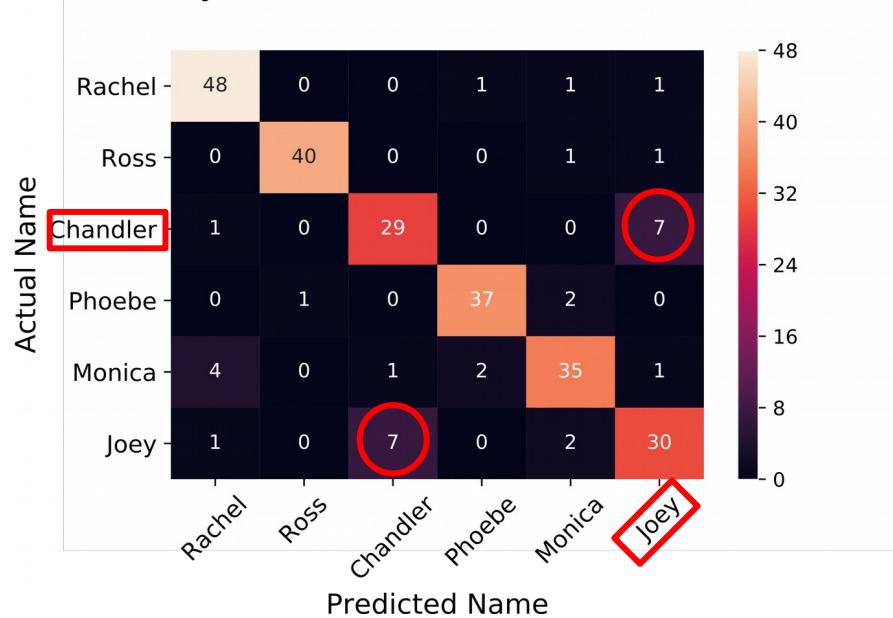
Accuracy: 86.56 %



First Approach: Building and training my NN

4. Evaluate model (*Scikit-Learn, Seaborn*)

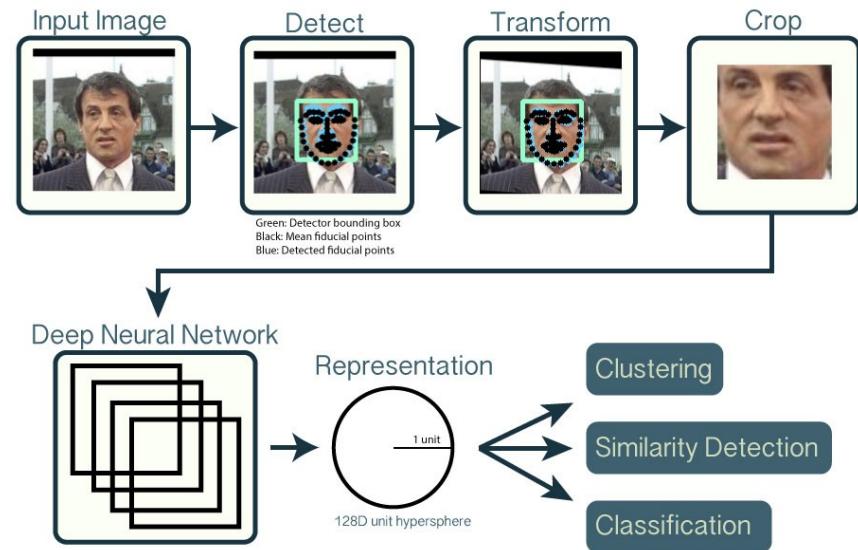
Accuracy: 86.56 %



Second Approach: Using a trained NN + classification

1. Prepare data (*PyTorch, OpenCV*)

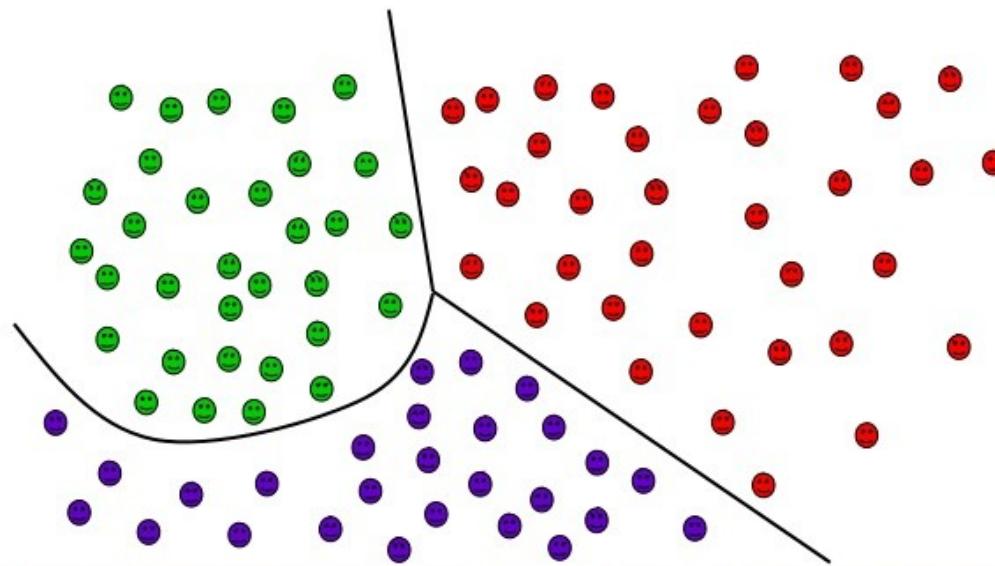
- Needs a much smaller dataset:
 - 20 pictures of each character alone
- Find and crop faces
 - Using already trained convolutional NN
- Get a vector encoding face features
 - Using pre-trained Deep NN
 - Maximizes distances between “people”



<https://github.com/timesler/facenet-pytorch>

Second Approach: Using a trained NN + classification

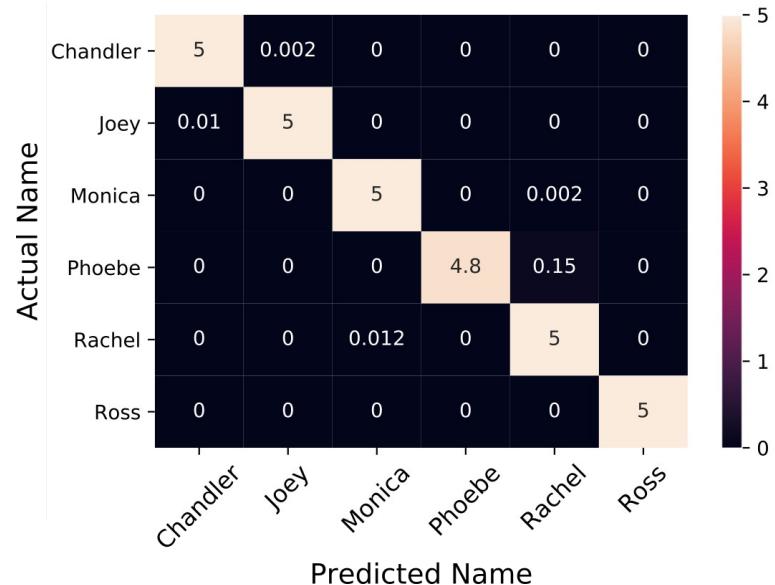
2. Classify vectors with Support Vector Machine (SVM) *(Scikit-Learn)*



Second Approach: Using a trained NN + classification

3. Evaluate model: K-Fold Cross validation *(Scikit-Learn / Seaborn)*

Average accuracy: 99.39%



Demo



```
[4] MINGW64:/f/Final_Project/demo
```

```
Marie@Marie-PC MINGW64 /f  
$ cd Final_Project/  
(base)  
Marie@Marie-PC MINGW64 /f/Final_Project (master)  
$ cd demo/  
(base)  
Marie@Marie-PC MINGW64 /f/Final_Project/demo (master)  
$ python demo_final_project.py  
Please wait while I download the files  
Name of the file? F7.jpg■
```

c:\ MINGW64:/f/Final Project/demo

```
Marie@Marie-PC MINGW64 /f
$ cd Final_Project/
(base)
Marie@Marie-PC MINGW64 /f/Final_Project (master)
$ cd demo/
(base)
Marie@Marie-PC MINGW64 /f/Final_Project/demo (master)
$ python demo_final_project.py
Please wait while I download the files
Name of the file? F7.jpg
```



MINGW64:f/Final_Project/demo

Marie@Marie-PC MINGW64 /f/Final_Project/demo (master)

\$ python demo_final_project ...

Please wait while I download

Name of the file? F7.jpg

Loading the picture...

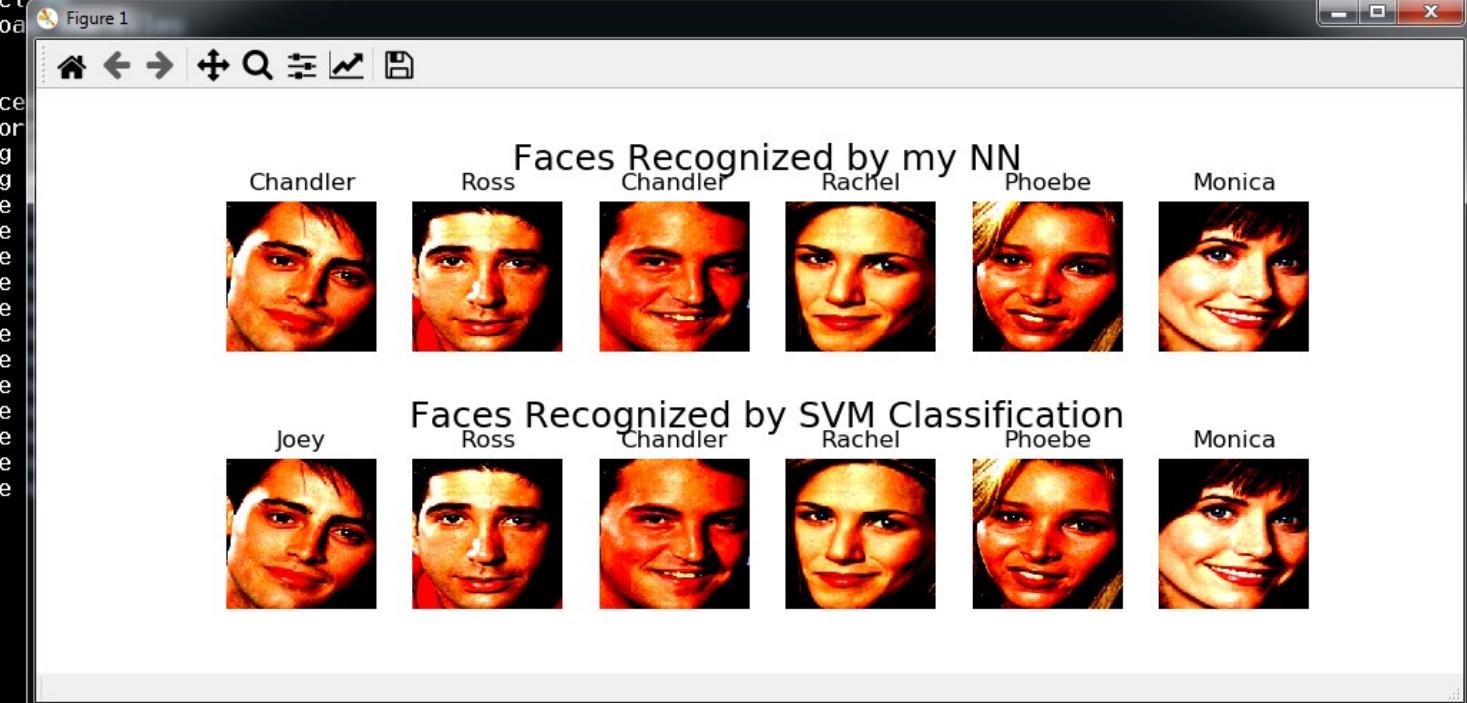
Detecting and cropping face

Calculating the vectors cor

Predicting the names using

Predicting the names using

Clipping input data to the



MINGW64:f/Final_Project/demo

Marie@Marie-PC MINGW64 /f/Final_Project/demo (master)

\$ python demo_final_project ...

Please wait while I download

Name of the file? F7.jpg

Loading the picture...

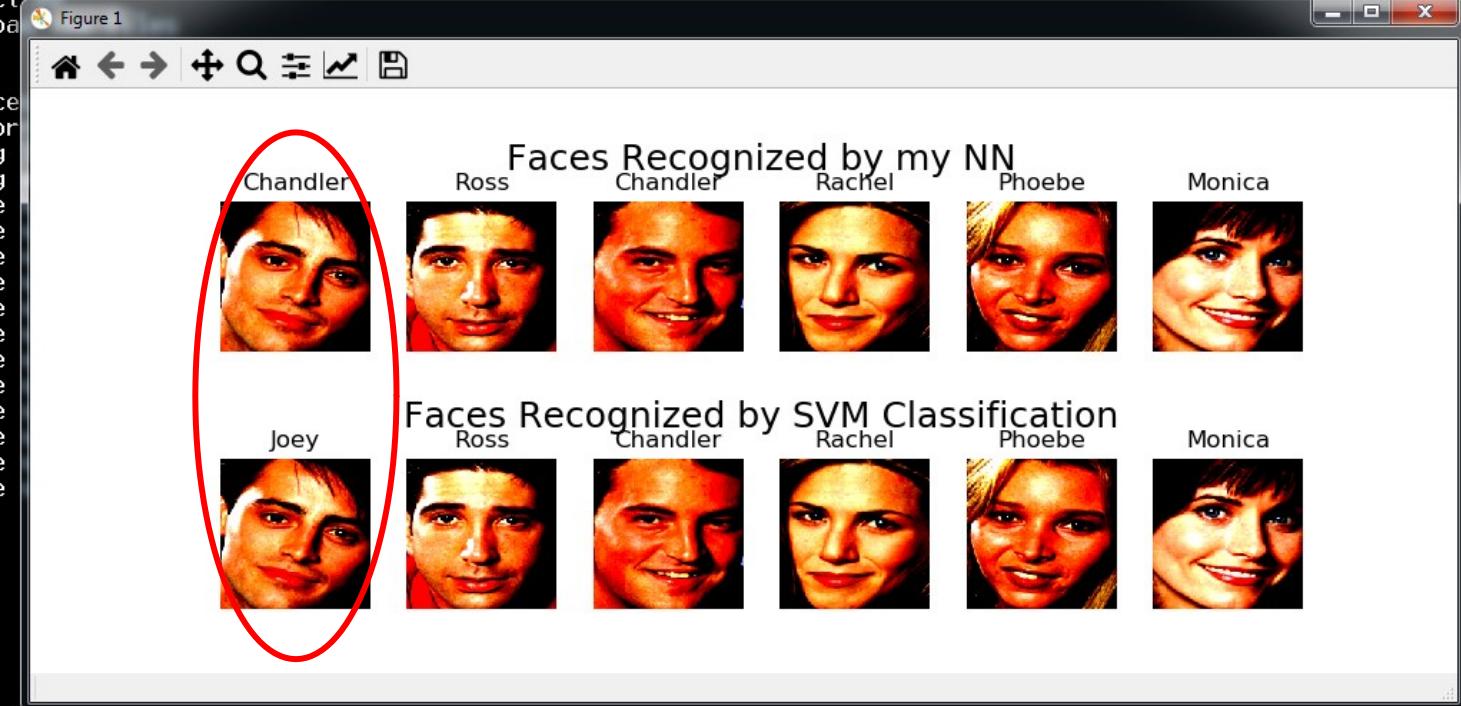
Detecting and cropping face

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Thank you!

