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Facial Recognition Software that Processes Videos

GithubLink: https://github.com/YafuDeng/481FinalProject_YafuDeng_TonyDo

User installation:

This project is using dlib library along with cmake since dlib library is written in C++, and our project is written in Python. Dlib is a modern C++ toolkit containing machines learning algorithms and tools for creating complex software in C++ to solve real world problems.

Our project is running on Ubuntu system, but the following setup code should also work on Mac.

Python version we are using: 3.6.8

Clone the code from Github:

```
git clone https://github.com/davisking/dlib.git
```

Build the main dlib Library:

```
cd dlib
mkdir build; cd build; cmake ..; cmake --build .
```

Build and install the Python extensions:

```
cd ..
python3 setup.py install
```

After that, pip3 install face_recognition to download this powerful facial recognition library. It is built based on dlib library and provides every possible features you can think of about facial recognition.

Project Goal:

The goal of this project is to process a video and output another video with all faces circled with a red rectangle on the original video. We are making it possible for the project to recognize all 11 sample people we've put into the training library. In addition, the project will label all unknown faces as unknown, which you can see in the attached pictures at the end of this documentation.

Limitation:

Although the project recognizes known faces really accurately, due to the following reasons, the project will have a hard time recognize a face or label it correctly:

1) Angle of the face: This one is easy to understand since the training data we provided to the project is front face and actor in the video will not always show their front faces all the time.

2) Light: This one holds the similar reason to the first reason. It will change the shape of the face and makes it really hard for the project to recognize the faces. Also, extreme expressions will also give the project hard time recognizing faces.

3) Distance: the distance here means the distance between the actor's face and the camera. This will cause the total pixels in the picture used to present the faces change dramatically, and that will influence the accuracy of the project.

Training video:

https://www.youtube.com/watch?v=F463aM90ZPM

Actors' face picture used for training:

Wentworth Miller, Dominic Purcell, William Fichtner, Lane Garrison, Peter Stormare, Wade Williams, Stacy Keach, Robin Tunney, Sarah Wayne Callies, Robert Knepper, Amaury Nolasco.

Outcome samples:

"Prison Break" (2005-09; 2017)
20th Television

watchmojo

Robert Knepper

Uknown

Amaury Nolasco

watchmojo

Sarah Wayne Callies

Stacy Keach

Wentworth Miller

Uknown