Facial Recognition

Challenge Question for McGill CodeJam 2014

Overview

A company specialising in personal security and authentication is working on a way to unlock devices such as your phone or laptop quickly, reliably and securely. They have put out word that they need consulting on this matter to develop a powerful application that will do just that. You and your team have decided to take on this challenge in hopes of being signed for a contract.

The company has published specifications for the program which are detailed below. They have put emphasis on the need for the program to be fast and reliable. It must have the lowest percentage of false positives as possible while being able to recognize faces in the most difficult of conditions.

You are provided with an extensive database of faces to train your program and improve on your algorithm's recognition patterns. Explicitly, the company requests that you do the following:

Put together a program that uses facial recognition to quickly and reliably recognize an individual from a set database.

The company will hold a judging session and invite a top set of teams to demonstrate their program's success at a live demo.

Your success will be judged based on the following criteria:

- The ability of your program to **recognize** an individual.
- The amount of **time** it takes for your program to recognize a face.
- The ability for your program to recognize faces in real time (extra).

It is recommended that you start thinking about the live demo and incorporating those concepts into your code from the beginning. You will however have time to tweak your code before the closing ceremonies if you're one of the top teams.

Specifications

In your System Image, have your final program as a compiled executable named “facerecognition” in the following directories:
Windows: C:\CodeJam
Ubuntu: /CodeJam

Compiled executable command usage:
facerecogntion subjectID_imageID.gif

Output will be the *subjectID*

Restrictions

Your program will have to follow a few restrictions:

- It must be able to run without internet access.
- It must not use any pre-built libraries or open source code that directly relates to facial recognition. The algorithm must be original and made by YOU. If you’re concerned that your code may violate this term since it is quite vague, please e-mail us.
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Database

The face database is released to you on behalf of Meltem Demirkus, PhD, with the following conditions:

- It must not be redistributed
- It is to be used for the purposes of this competition only.

Submissions

To submit their challenge solutions this year, CodeJam requests participants to use vagrant to download a VM image, develop their solution, and submit the entire VM image.

Install vagrant from here, you must also install virtualbox, and ensure ssh is available on your path. Once those utilities are installed, you must add VBoxManage program (from VirtualBox) to your Path.

When everything is set up (vagrant, VBoxManage, and ssh are on your path). Execute the following commands:

Install an Ubuntu VM	Install a Windows VM
1. vagrant init chef/ubuntu-14.04 (append -i386 for 32-bit) 2. vagrant up 3. vagrant ssh	1. vagrant init https://drive.google.com/file/d/0B9HtUd4p9BuLSmEyUW1HTGJxWnc/view?usp=sharing 2. Replace generated VagrantFile with this one 3. vagrant up 4. vagrant rdp

Note: the default user is named vagrant and the password is vagrant

To submit the VM, you are required to find the folder where virtualbox has the VM stored, and submit that.