Vg101: Introduction to Computer and Programming

Spring 2021

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Task 5 C++ Programming: Catch your face

You are advised to use C++ to solve Task 4, but it is really up to you which programming language you want to choose for this task.

1. Introduction

Face recognition is a method of identifying or verifying the identity of an individual using their faces. It is a very active research topic in the research of Artificial Intelligence.
In order to recognize a face, we first need to catch the face/s on a photo. There are wide range of tools which can be used for face detection. This lab task is to facilitate some third part library/libraries to catch faces from a given photo.

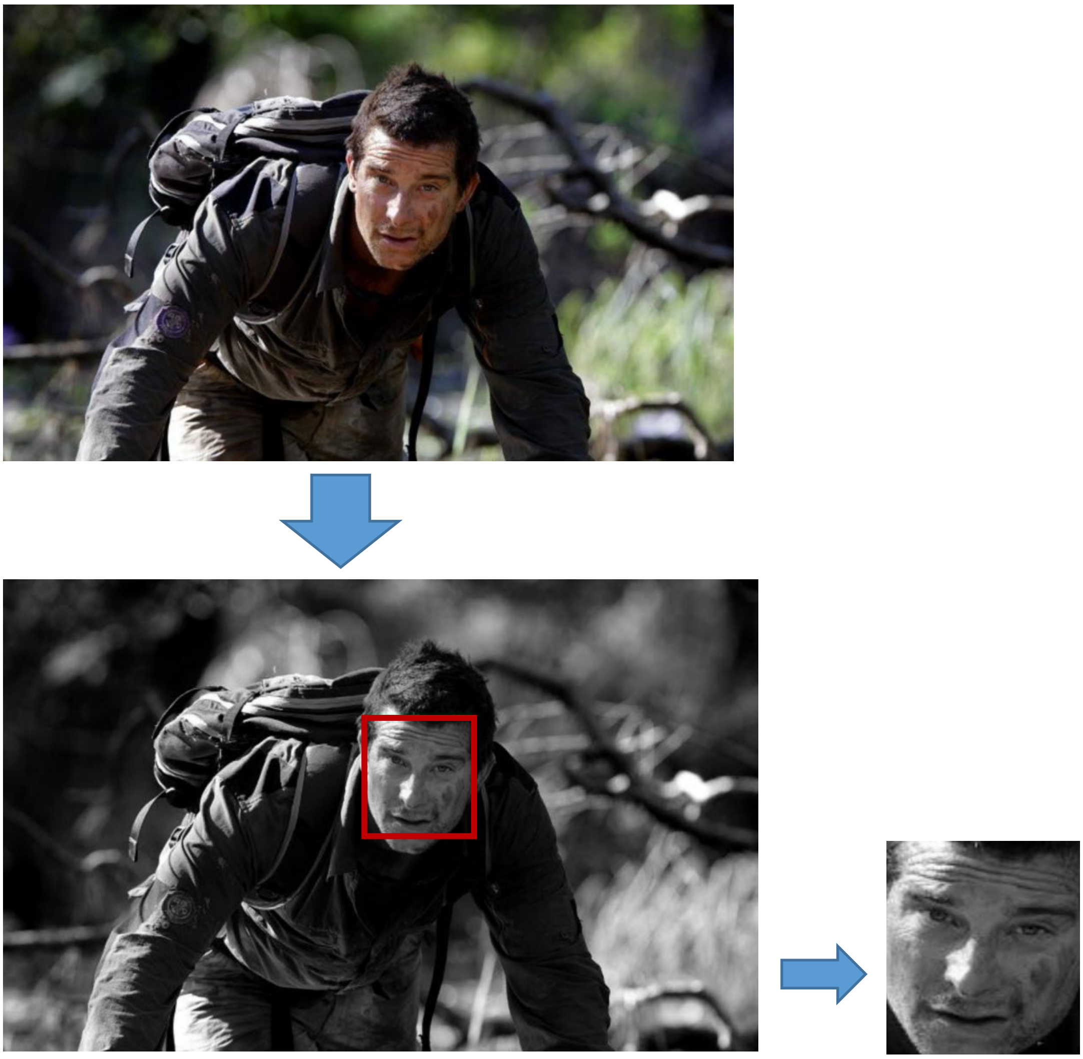
2. Task explanation

It is not easy to design and implement an algorithm for face detection starting with a clean slate. Fortunately, we never need to do that, as there are a number of libraries which can be used directly to conduct nice face detection.
Following issues need to be considered in this lab task:

a) Learn how to use a third-part library in your IDE (e.g. VS2019)
b) Choose a library or libraries wisely. Issues for considering:
   i. Can provide the functions you need;
   ii. Well documented or easy to get online support, e.g online tutorials, well explained documents, example code, etc.
c) In your future study or career (but maybe not for this lab task), Github might be a good place to find some similar projects which you can use with minor changes.
d) OpenCV can be a good choice for you. There also exist some alternatives, such as Dlib, MTCNN, etc..
e) To simplify the task, you are not asked to using any deep learning approaches for face detection. OpenCV Haar-Cascade or Dlib HOG-SVM is recommended.

Requirements:

a) For a given photo, detect the area of face(s) in the photo. The library may request you to convert your colored photo to gray-scale image.
b) Cropping the face(s) out and saving it(them) as 32x32 gray-scale image(s).
c) Following figures illustrate the requirements
d) Try your own photo, with the program you create. :-)



3. Assessment
    a) On-site demo and explanation will be required; (20)
    b) Code should be well commented and correctly named;(20)
    c) Functionalities implemented;(60)

4. Submission

Demo: on the last week of our lab session. (Friday afternoon, Week 15)

Code: should be submitted before the demo. (deadline)

Naming conventions:

[studentID]_[name].cpp (if you use C++) or [studentID]_[name].zip (if you want to hand in multiple files)

e.g. 202012345_张三丰.cpp or 202012345_张三丰.zip

Please explain external libraries used, in your comments.

DO NOT submit your project files.

Expecting to receive an All-In-One zip file for each class.