

Dear Candidate:

Here is the C++ Coding Assignments –

Assignment #1 -

Instruction – please comment your code clearly

a) Download and Use this source footage -

https://drive.google.com/file/d/10SFV1l9sxac0N7zctc_kAa_j_Qjxw_od/view?usp=sharing

b) Set-up and deploy openCV.

c) Detect facial landmarks for each frame and save the video output. You can use any existing landmark detection method. When you play the output video, you will see that, because it find landmarks for each frame, they are not in the exactly same position on the face, which leads to severe jitters in the 3D mesh.

d) One way to resolve or mitigate the instability is to use temporal smoothing to the landmarks.

Here is a paper that implements the temp smoothing to resolve the same issue.

https://drive.google.com/file/d/1la_Gpgxoq2WtlvxFdmQx5e3ATQjjCPG/view?usp=sharing

It is in Section 6.3 Pose and Lighting (page 9-10) under the pseudo code.

NOTE – This does not require generating 3D mesh. Please only find and work with landmarks and only implement only the temporal smoothing. Please feel free ask any questions.

Output to send to us – 1) initial landmarks output video, 2) final landmarks output video with temporal smoothing, 3) source code.

Assignment #2 –

Currently a program takes a video file and converts into individual frame images. It, however, has the following naming convention as frame_1, frame_2, etc.

But this is incorrect. Instead we want a program to take the number of frames in the video, take the number of digits and place leading zeroes to each frame number. So for a video that has, for example 1357, it will automatically name each frame

Frame_0001, frame_0002 ,frame_0003,frame_1000, frame_1001, frame_10002,frame_1356, frame_1357 etc

Here is a source clip that has over several thousand frames. Please use this clip and number the frames using this convention.

<https://drive.google.com/file/d/13wT1hsSwt4Ylx3vqJsQJ5FlfEfVKVour/view?usp=sharing>

We are looking for an efficiency here. Thank you.

Output to send to us – 1) Source code, and 2) a folder containing - first 10 frames and 10 frames 0999 to frame 1010 and the last 10 frames.