



Indian Institute of Science Education and Research
Bhopal
Computer Vision(DSE/EECS-312)
Assignment-3

Deadline: 18-11-2024, 11:59 PM

Max mark: 12

Please follow the instructions carefully.

1. All questions are mandatory. Plagiarism and copying from anywhere (similar submission) can debar you from this course and invite the academic dishonesty policy.
 2. Implement all algorithms purely in Python without using specialized libraries like OpenCV or PIL for the processing. You may use libraries for basic operations (like loading an image), but the algorithms should be coded from scratch.
 3. Comment on your code extensively to explain your logic and the steps you are implementing.
 4. Display both the original and processed images to compare results.
 5. Make a short 7-minute video and explain your code.
 6. A report reflecting on what you have learned. Visualization of the output must be there along with other necessary details.
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1. Apply the filters mentioned below on the image attached and analyze their impact. Describe what you found after applying each filter and why certain phenomena occur. (**Marks:6**)
 - SHIFT
 - Bag of Words
 - HOG

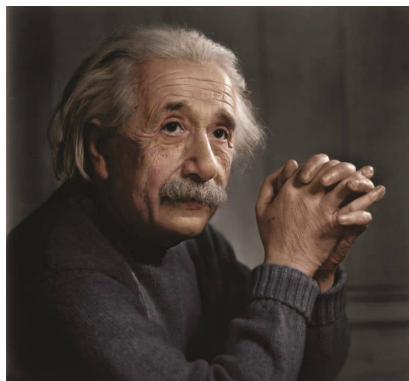


Figure 1: Image of Albert Einstein.

2. Imagine you're monitoring pedestrian movement at a crosswalk. Your task is to track the direction and speed of pedestrians in a video using optical flow analysis. Use OpenCV's built-in video `vtest.avi`, which simulates real-world pedestrian movement. **(Marks:6)**

- Using the Lucas-Kanade method, track specific points in the video to capture the movement of pedestrians.
- Visualize the direction of movement using arrows to indicate the flow direction at each point.
- Provide a brief summary: What patterns do you observe in pedestrian movement? Are there any areas where pedestrians tend to cluster or move faster?