Assignment 2 : **Pedestrian Tracking, Prediction, Analysis**

This assignment will be on analyzing pedestrian motion, tracking them and attempting to solve some issues related to pedestrian tracking (which we discussed in the class today). Our baseline tracker will be a blob-detection code (without any motion model information).

1) Please download the code (C++/Python) from this github website
- https://github.com/spmallick/learnopencv/tree/master/BlobDetector
(You can use any other open source blob tracking code you want in **any language**)

2) Please download these three low-density pedestrian/crowd dataset (from different sources). All the datasets have annotated pedestrian trajectories (ground-truth) but we will use that only for the last question (Bonus Question). Some of the datasets have camera parameters, you can ignore them for this assignment and assume that all data is camera corrected.
Download link - http://www.cs.unc.edu/~ab/Datasets/Datasets.zip

Once you've done setting up, you will need to do the following tasks. Please also write **3-4 lines** for every task describing -

- *Your approach*
- *Why it will work?*
- *Where will it fail? Can you think of specific scenarios?*
- *What more could you have done if you had more time?*

Task 1: While tracking, many of the pedestrians will be incorrectly tracked (the tracker tracking something else). What is the major reason for that and attempt to solve it.

Task 2: In some cases, when the pedestrians are occluded by other pedestrians or static obstacles, tracker loses accuracy. What can you do to solve or improve accuracy for both these cases separately.

Task 3: Build a baseline prediction algorithm for pedestrians using a constant velocity motion model (estimate future paths assuming that pedestrians are moving in a constant velocity).

Task 4: Use **Task 3** to improve tracking accuracy (reduce loss of tracking when pedestrian is partially/fully occluded).

Task 5: Analyse trajectories. Build baseline high-level trajectory understanding models (analyze positions and velocities to detect if people are standing, if two or more people are moving in a group etc)

Task 6 (Bonus): Compute accuracy of the tracker before and after the improved prediction (**Task 3**). Use a simple approach like distance between consecutive positions etc. (tracked vs ground-truth).

If you have any questions, feel free to ask. It is due by **23:59 EST on Oct 30**. Please organize your submission zip file by task. Attach your code snippets, answers and output videos.

Good luck :-)

You will **NOT** be evaluated on how good or bad your tracking results look but based on how well you answer the five questions!!!