Face Detection

1. **Face detection approaches:**
    a. Haar Classifier
    b. Dlib (Hog, CNN)
    c. UltraLight Face detection
    d. Yolo Face
    e. Many more

2. **Problems in face recognition**

3. **A comparison of different face detection algorithms**

Tasks:

1. Study different face detection algorithms
2. A comparative study of different face detection algorithms
3. Implementation of face detection algos (Haar cascade and Dlib in particular)

References:

1. Haar Cascade explanation and implementation - https://opencv-python-tutroals.readthedocs.io/en/latest/py_tutorials/py_objdetect/py_face_detection/py_face_detection.html
2. Detailed HoG explanation with code snippets - https://www.learnopencv.com/histogram-of-oriented-gradients/
3. How HoG works - https://medium.com/analytics-vidhya/a-take-on-h-o-g-feature-descriptor-e839ebba1e52
4. Face detection -Haar, Dlib and DL- https://www.learnopencv.com/face-detection-opencv-dlib-and-deep-learning-c-python/

5. Dlib detection - https://towardsdatascience.com/cnn-based-face-detector-from-dlib-c3696195e01c
6. Ultra Light face detection (Most robust face detection method till now for small edge devices) - https://medium.com/syncedreview/smaller-is-better-lightweight-face-detection-for-smartphones-bcd27a1a1a82
7. Ultralight face detection implementation - https://github.com/Linzaer/Ultra-Light-Fast-Generic-Face-Detector-1MB

Fig1. This image uses Ultra Light face detection model which can be run on CPU. Gives amazing results. (recommended to try)