**Algorithm:**

1. I have cut the template image manually from given images and tried to run my algorithm on multiple template as well. I did not find much difference in the results.
2. Used the same algorithm formula provided in the problem descriptions for sum of squared difference, cross correlation and normalized cross correlation.
3. SSD (Sum of square difference): In this function I used the template from step 1 and move over the complete image pixel by pixel. Calculate the SSD scores and store the sum of square difference values in different array and finally find the minimum value from that array. Most of the time it matches the template and detect the object (face in this case) in the template.
4. NCC (Normalized Cross Correlation): Normalized cross correlation (NCC) algorithm is based on finding the cross correlation between two consecutive frames in an image and the template. If the two consecutive frames are exactly same, then the value of Normalized cross correlation is maximum. For the moving object in the image sequence, means the two consecutive frames are not exactly same, with respect to positions of the pixel values. In that case the value of Normalized cross correlation is less than maximum value obtained.
5. CC (Cross Correlation): Cross Correlation is basically like Normalized Cross Correlation. The main difference is that we do not divide the score with normalized value.
6. Finally draw a rectangle on all the images using the best score and combine those images to make the video.

Please find the attached jupyter notebook for more details.

**Results**:

I found that the results for sum of squared difference and normalized cross correlation are far better than the cross-correlation images for template matching. It catches the template (face) in most of the cases. Only when the object is moving (coming in and going out) or partial occlusion, sometimes it failed to detect the template in the image.

Also, the results seem little affected if I change the template.

Please find some of the intermediate results images attached below:

 SSD  CC  NCC

Please find the complete video of the face detection for all algorithm in the zip file (\*avi).