

Akshara Joshi

11011858

## **Automatic Offline Handwritten Signature Verification**

Handwritten signatures are processed with brightness threshold with threshold value 127. For processed image sobel filter is applied to obtain gradient values along x and y axis. Intensity and angle are calculated using formula with  $g_x$  and  $g_y$  values. The feature extraction using gradient values is done using decomposition of gradient vector (4- chain code direction) method 1. Down-sampling of image into  $9 \times 9$ . Concatenating the gradient feature from each block to form a vector feature values with multi-dimensionality. Cosine angle between these two gradient feature vectors is calculated. Based on the value we can determine the similarity between two signatures.