

## **Abstract**

This Dissertation includes work on face recognition using a novel technique based on Fisher's discriminant analysis and fuzzy rough set. Different challenges in face recognition are identified. FDA is used to increase the distances between classes and reduces the distances within classes. That makes proposed method more efficient. Anomalies due to different light conditions are normalized at preprocessing stage. Histogram equalization is used to deal with huge light variation in individual image and then global normalization is done.

Features extracted by FDA are reduced by fuzzy rough set. Fuzzy rough set provides a remarkable amount of reduction. These features are from different face images. So, we used Neural Network with back-propagation for classification. Only one neural network is with  $N$  (number of classes) outputs is used.

UMIST and Yale face dataset are being used for testing purpose. UMIST dataset contains profile and frontal face images with different poses and Yale dataset contains frontal images with huge light variation. 15 images are used to for training and other 15 images are used for testing.

Good results are obtained on both datasets. For UMIST recognition rate is 89.3% and for Yale dataset it is 86.6%.