CERIAS

the center for education and research in information assurance and security

Filter Selection Schema for Improved Face Recognition

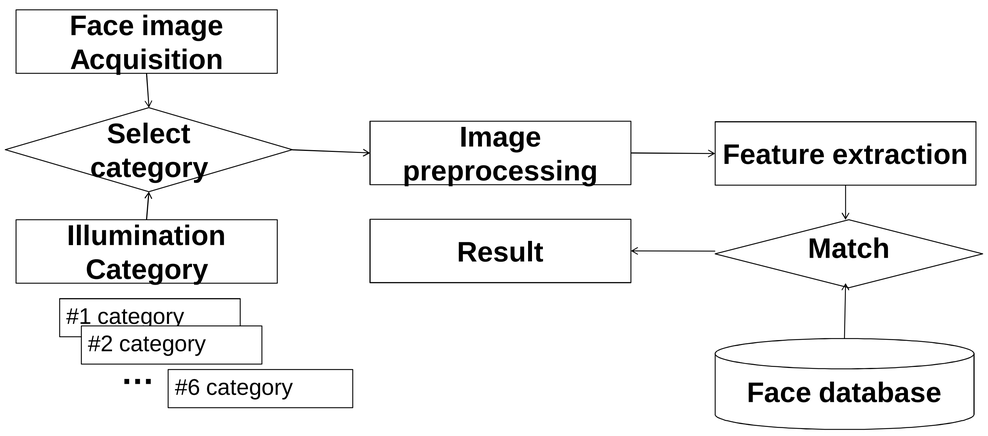
I.J., Jun, Ph.D, S.K., Modi , Ph.D & S.J., Elliott, Ph.D.

Biometric Standards, Performance and Assurance Laboratory, Department of Industrial Technology

Introduction

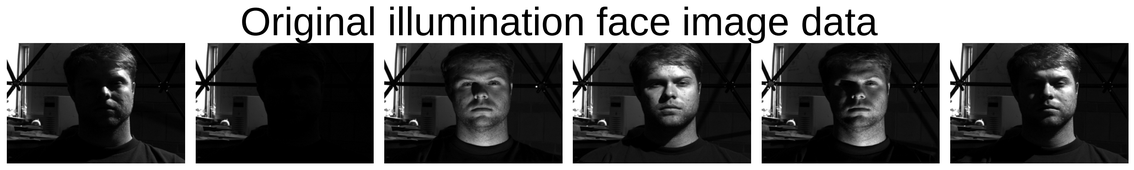
- Face recognition is a convenient method of authentication because facial characteristics are easy to capture
- However recognition algorithms are impacted by various illumination levels and face feature visibility
- The proposed schema can adapt to changing illumination conditions by selecting the most optimal filter for a specific illumination condition

Methodology

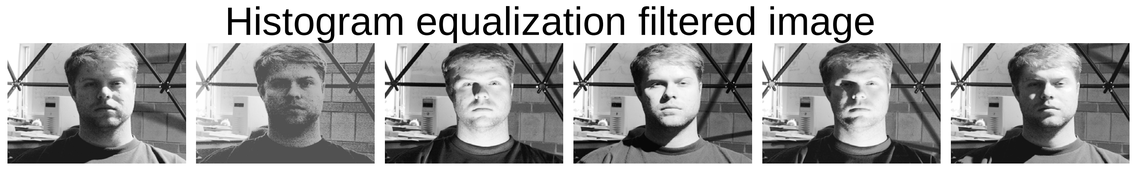


Face Database : Original & Modified Images

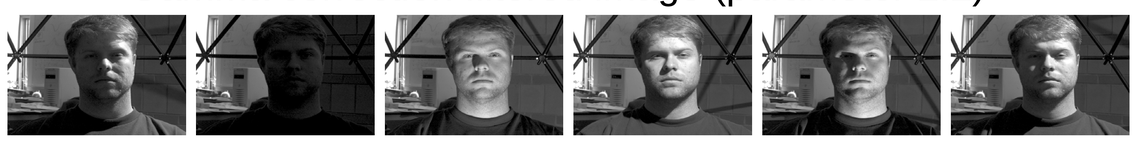
Original illumination face image data



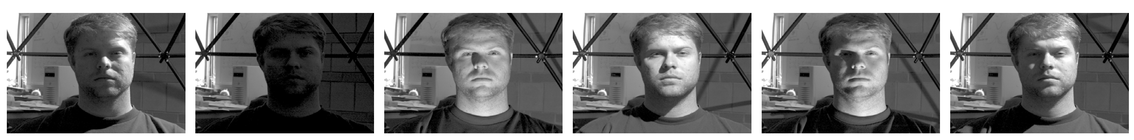
Histogram equalization filtered image



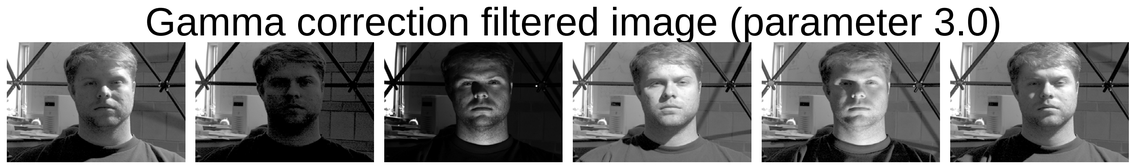
Gamma correction filtered image (parameter 2.2)



Gamma correction filtered image (parameter 2.6)

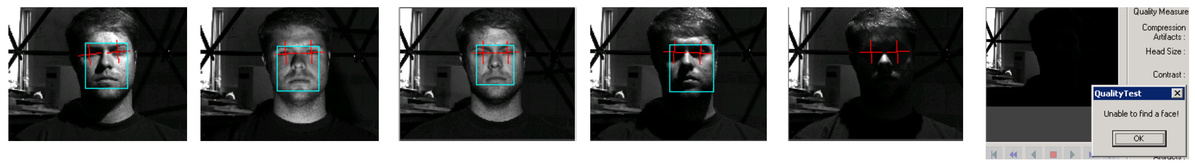


Gamma correction filtered image (parameter 3.0)



Face Detection at Illumination Levels

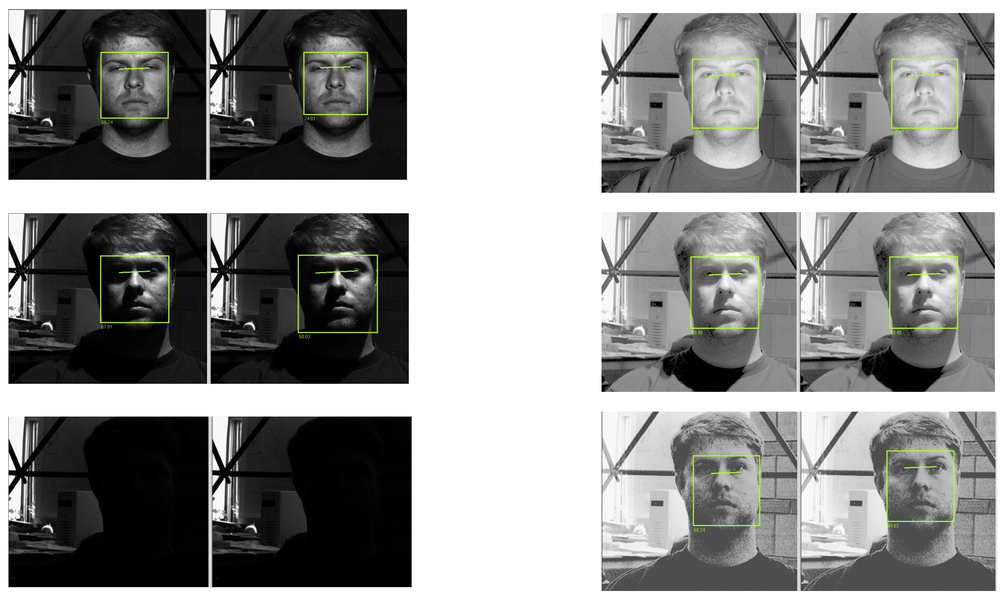
level 1 level 2 level 3 level 4 level 5 level 6



Results

Original enrollment rate : 0.58
Original image FRR : 0.28

Filtered enrollment rate : 0.96
Filtered image FRR : 0.30



Enrollment & Verification Error Rate

Conclusions

- The proposed scheme can adapt itself to changing environment illumination by filter selection method.
- There is an increase in enrollment rate for different illumination levels
- Future work is to improve recognition error rate

PURDUE UNIVERSITY

CERIAS

Discovery Park e-Enterprise Center