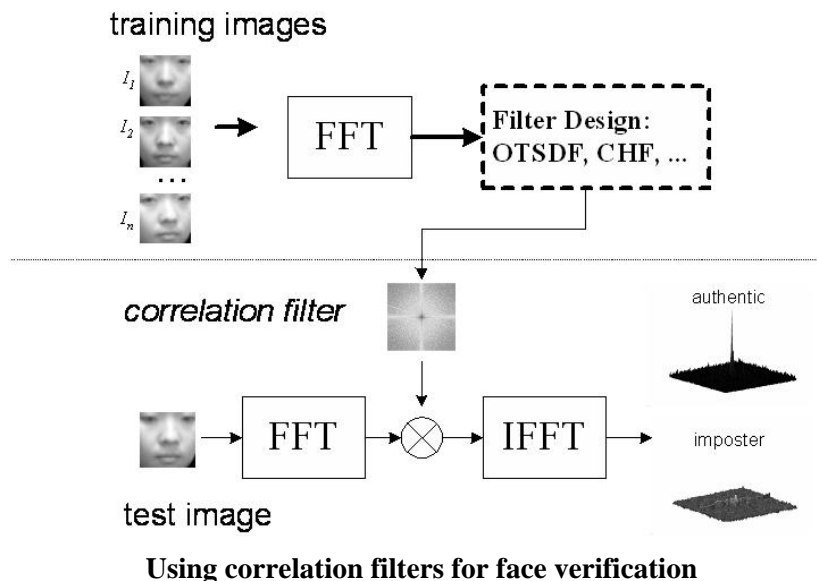


Face Recognition using Correlation Filters

Prof. Vijayakumar Bhagavatula
Data Storage Systems Center (DSSC)
Carnegie Mellon University, Pittsburgh, PA, USA

Human face recognition is currently a very active research area [1, 2] with focus on ways to perform robust identification. However, face recognition is a challenging task because of the variability of the appearance of face images even for the same subject as it changes due to expression, occlusion, illumination, pose, aging etc. Most approaches to face recognition are in the image domain whereas we believe that there are more advantages to work directly in the spatial frequency domain. By going to the spatial frequency domain, image information gets distributed across frequencies providing tolerance to reasonable deviations and also providing graceful degradation against distortions to images (e.g., occlusions) in the spatial domain. Correlation filter technology [3] is a basic tool for frequency domain image processing. In correlation filter methods, normal variations in authentic training images can be accommodated by designing a frequency-domain array (called a correlation filter) that captures the consistent part of training images while de-emphasizing the inconsistent parts (or frequencies). Object recognition is performed by cross-correlating an input image with a designed correlation filter using fast Fourier transforms (FFTs).

The Face Recognition Grand Challenge (FRGC) [4] has been organized to facilitate the advancement of face recognition processing across the broad range of topics including pattern recognition algorithm design, sensor design, and in general for advancing the field of face recognition. We are developing correlation filters [5-6] that have been shown to exhibit better tolerance to noise and illumination variations than many space domain methods. Correlation-filter based methods have performed very well in FRGC experiments [7].



References

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