Announcing the Final Examination of Taif Al Obaidi for the degree of Doctor of Philosophy

Time & Location: March 22, 2018 at 11:00 AM in HARRIS CORPORATION ENGINEERING CENTER (HEC) 113

Title: DIFFERENT FACIAL RECOGNITION TECHNIQUES IN TRANSFORM DOMAINS

The human face is frequently used as the biometric signal presented to a machine for identification purposes. Several challenges are encountered while designing face identification systems. The challenges are either caused by the process of capturing the face image itself, or occur while processing the face poses. Since the face image not only contains the face, this adds to the data dimensionality, and thus degrades the performance of the recognition system. Face Recognition (FR) has been a major signal processing topic of interest in the last few decades. Most common applications of the FR include, forensics, access authorization to facilities, or simply unlocking of a smart phone. The three factors governing the performance of a FR system are: the storage requirements, the computational complexity, and the recognition accuracy. The typical FR system consists of the following main modules in each of the Training and Testing phases: Preprocessing, Feature Extraction, and Classification. The ORL, YALE, FERET, FEI, Cropped AR, and Georgia Tech datasets are used to evaluate the performance of the proposed systems. The proposed systems are categorized into Single-Transform and Two-Transform systems. In the first category, the features are extracted from a single domain, that of the Two-Dimensional Discrete Cosine Transform (2D DCT). In the latter category, the Two-Dimensional Discrete Wavelet Transform (2D DWT) coefficients are combined with those of the 2D DCT to form one feature vector. The feature vectors are either used directly or further processed to obtain the persons' final models. The Principle Component Analysis (PCA), the Sparse Representation, Vector Quantization (VQ) are employed as a second step in the Feature Extraction Module. Additionally, a technique is proposed in which the feature vector is composed of appropriately selected 2D DCT and 2D DWT coefficients based on a residual minimization algorithm.

Major: Electrical Engineering

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Bachelor's of Electrical Engineering, BS, 2006, Al-Mustansiriya University
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Master's of Electrical Engineering, MS, 2015, University of Central Florida

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Approved for distribution by Wasfy Mikhael, Committee Chair, on February 8, 2018.

The public is welcome to attend.