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## ACCEPTED MANUSCRIPT

### Wavelet-based gender detection on off-line handwritten documents using probabilistic finite state automata

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#### Abstract

Detection of gender from handwriting of an individual presents an interesting research problem with applications in forensic document examination, writer identification and psychological studies. This paper presents an effective technique to predict the gender of an individual from off-line images of handwriting. The proposed technique relies on a global approach that considers writing images as textures. Each handwritten image is converted into a textured image which is decomposed into a series of wavelet sub-bands at a number of levels. The wavelet sub-bands are then extended into data sequences. Each data sequence is quantized to produce a probabilistic finite state automata (PFSA) that generates feature vectors. These features are used to train two classifiers, artificial neural network and support vector machine to discriminate between male and female writings. The performance of the proposed system was evaluated on two databases, QUWI and MSHD, within a number of challenging experimental scenarios and realized classification rates of up to 80%. The ex-

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