

# Classification of gait patterns based on fourier descriptor and support vector machine

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## ABSTRACT

The integration of human motion analysis and biometrics in intelligent video surveillance system (IVSS) has become a new research topic during the past years. Among the technologies in IVSS, the most important one is automatic human identification, which can be reliably achieved using biometric characteristics such as iris, fingerprints, signatures, and voice patterns for identification. However, these biometrics methodologies are either intrusive or constrained to many well-controlled scenarios. As a new biometrics method, gait recognition aims to identify persons by their walking styles. Compared with other biometrics such as iris and fingerprints that are widely used in some security-sensitive applications, human gait has many advantages of being non-intrusive and lower requirement of image resolution. In this paper, we present a novel method for gait recognition of different groups of pedestrians based on Fourier descriptors (FDs) and support vector machine (SVM). The proposed method involves the procedures of background modeling, extraction of gait silhouettes by background subtraction, shadow removal, representation of gait shapes using the FDs, and recognition of human gaits by an SVM Classifier. To confirm the robustness of the proposed method, 5 different groups with 15 image sequences, including the pregnant, the child, the adult, the people with a walking stick, and the aged, are utilized. Experimental results show that the correct recognition rate (CRR) of 81% using only the first 20 coefficients of FDs can be achieved, indicating the feasibility of the proposed method. Moreover, another representation of gait silhouettes using shape boundary points of  $K=64$  is used to achieve a correct recognition rate of 79%.

Keywords : Gait recognition、 Support vector machine

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