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Sensor fusion for a biometric system using gait

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We consider a multimodal biometric system which authenticates people based on their gait. Computationally efficient techniques were developed to extract characteristic gait features from ground reaction force and video data of the walking subject. Specifically, the data consists of one classifier based on the ground reaction force and three based on visual features. A new variant of the generalized principal component analysis is used to efficiently reduce data dimensionality and to optimize class separability. A technique based on the Bayes risk criterion subsequently integrates the multiple classifiers. The proposed multimodal approach significantly increases recognition robustness and reliability. Experimental results showed an equal error rate of less than 0.3% which makes the method applicable for medium security applications.

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