

## **Multiple Traits for People Identification**

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Present biometric systems mostly rely on a single physical or behavioral feature for either identification or verification. However, day to day use of single biometrics in massive or uncontrolled scenarios still has several shortcomings. These can be due to complex or unstable hardware settings, to changing environmental conditions or even to immature software procedures: some classification problems are intrinsically hard to solve. Possible spoofing of single biometric features is an additional issue. Last but not least, some features may occasionally lack the requisite of universality. As a consequence, biometric systems based on a single feature often have poor reliability, especially in applications where high security is needed.

Multimodal systems, i.e., systems that concurrently exploit multiple features, are a possible way to achieve improved effectiveness and reliability. There are several issues that must be addressed when designing such a system, including the choice of the set of biometric features, the normalization method, the integration schema and the fusion process, and the use of a measure of reliability for each subsystem on a single response basis. This chapter describes the state of the art regarding such issues and sketches some suggestions for future work.