

Tutorial Information

1. *An Introduction to Biometrics*

8:30-16:30

Marriott Waterside, Room 6

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Abstract – Biometrics refers to the automatic identification (or verification) of an individual (or a claimed identity) by using certain physical or behavioral traits associated with the person. By using biometrics it is possible to establish an identity based on 'who you are', rather than by 'what you possess' (e.g., an ID card) or 'what you remember' (e.g., a password). Therefore, biometric systems use fingerprints, hand geometry, iris, retina, face, vasculature patterns, signature, gait, palmprint, or voiceprint to determine a person's identity.

The purpose of this tutorial is two-fold: (a) to introduce the fundamentals of biometric technology from a pattern recognition and signal processing perspective by discussing some of the prominent techniques used in the field; and (b) to convey the recent advances made in this field especially in the context of security, privacy and forensics. To this end, the design of a biometric system will be discussed from the viewpoint of four commonly used biometric modalities - fingerprint, face, hand, and iris. Various algorithms that have been developed for processing these modalities will be presented. Methods to protect the biometric templates of enrolled users will also be outlined. In particular, the possibility of performing biometric matching in the cryptographic domain will be discussed. The tutorial will also introduce concepts in biometric fusion (i.e., multibiometrics) in which multiple sources of biometric information are consolidated. Finally, there will be a discussion on some of the challenges encountered by biometric systems when operating in a real-world environment and some of the methods used to address these challenges.

Topics Covered:

- What is Biometrics
- Biometric Traits
- Biometric Applications
- Designing a Biometric System
- Performance Evaluation
- Case Studies
- Multibiometrics
- Application in Forensics
- Securing Biometric Templates
- Challenges in Biometrics