Secure Identity Verification

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Abstract: Biometrics are an inherent link to our identity and useful for a number of applications including access control and online transactions. Keeping this information secure is a primary concern. However, biometric data is noisy and secure matching of this data poses new security challenges. This talk will examine two approaches for secure identity verification. The first scheme considers the application of distributed source coding techniques to cope with noisy biometric measurements. A Slepian-Wolf coding system is used to provide robust biometric verification for genuine users, while guarding against attacks from imposters. A formal quantification of the tradeoff between security and robustness is provided as a function of the Slepian-Wolf coding rate. The second approach addresses the same problem with privacy-preserving protocols for secure distance computations. These protocols exploit the properties of homomorphic encryption and are developed for a variety of functions including Hamming distance, L2-norm and L1-norm. The benefits and drawbacks of these two different approaches will also be discussed.

Bio: Anthony Vetro received the B.S., M.S. and Ph.D. degrees in Electrical Engineering from Polytechnic University, Brooklyn, NY. He joined Mitsubishi Electric Research Labs, Cambridge, MA, in 1996, where he is currently a Group Manager with responsibility for research and development in the area of multimedia and information coding. He has published more than 150 papers on video coding, display processing, biometric security and multimedia adaptation. He has also been an active member of the MPEG and ITU-T standardization committees, where he has served as editor and ad-hoc chair for several projects. He was a key contributor to the Multiview Video Coding extension of the H.264/AVC standard, and serves as Vice-Chair of the US delegation to MPEG. Dr. Vetro is active in various IEEE conferences, technical committees and editorial boards. He has also received several awards for his work on transcoding, including the 2003 IEEE Circuits and Systems CSVT Transactions Best Paper Award. He is a Senior Member of the IEEE.