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Sommario/riassunto	Biometrics, the science and practice of automated person recognition based on physical or behavioral traits, is a critical technology for many contemporary applications ranging from mobile phone unlock to international border control. This textbook introduces the fundamental concepts and techniques used in biometric recognition to students, practitioners, and non-experts in the field. Specifically, the book describes key methodologies used for sensing, feature extraction, and matching of commonly used biometric modalities such as fingerprint,

face, iris, and voice. In addition, it presents techniques for fusion of biometric information to meet stringent accuracy requirements, also discussing various security issues and associated remedies involved in the deployment of biometric systems. Furthermore, this second edition captures the progress made in the field of biometric recognition, with highlights including: Lucid explanation of core biometric concepts (e.g., individuality and persistence), which builds a strong foundation for more in-depth study and research on biometrics A new chapter on deep neural networks that provides a primer to recent advancements in machine learning and computer vision Illustrative examples of how deep neural network models have contributed to the rapid evolution of biometrics in areas such as robust feature representation and synthetic biometric data generation A new chapter on speaker recognition, which introduces the readers to person recognition based on the human voice characteristics Presentation of emerging security threats such as deepfakes and adversarial attacks and sophisticated countermeasures such as presentation attack detection and template security <While this textbook has been designed for senior undergraduate students and first-year graduate students studying a course on biometrics, it is also a useful reference guide for biometric system designers, developers, and integrators. Anil Jain, Arun Ross, and Thomas Swearingen are associated with Michigan State University, East Lansing, Michigan, USA. Anil Jain is a University Distinguished Professor, Arun Ross is the Martin J. Vanderploeg Endowed Professor. Karthik Nandakumar is an Associate Professor at Mohamed Bin Zayed University of Artificial Intelligence, Abu Dhabi, United Arab Emirates. Thomas Swearingen is a Ph.D. student.
