Preface

The constantly changing landscape of Biometrics makes it challenging for experts and practitioners to stay informed of the field’s most up-to-date research. That is why Information Science Reference is pleased to offer this three-volume reference collection that will empower students, researchers, and academicians with a strong understanding of critical issues within Biometrics by providing both broad and detailed perspectives on cutting-edge theories and developments. This reference is designed to act as a single reference source on conceptual, methodological, technical, and managerial issues, as well as provide insight into emerging trends and future opportunities within the discipline.

*Biometrics: Concepts, Methodologies, Tools and Applications* is organized into six distinct sections that provide comprehensive coverage of important topics. The sections are:

1. Fundamental Concepts and Theories;
2. Tools and Technologies;
3. Utilization and Application;
4. Organizational and Social Implications;
5. Critical Issues; and

The following paragraphs provide a summary of what to expect from this invaluable reference tool.

Section 1, “Fundamental Concepts and Theories,” serves as a foundation for this extensive reference tool by addressing crucial theories essential to the understanding of Biometrics. Introducing the book is *Biometric: Authentication and Service to Cloud* by Ajay Rawat and Shivani Gambhir; a great foundation laying the groundwork for the basic concepts and theories that will be discussed throughout the rest of the book. Section 1 concludes, and leads into the following portion of the book with a nice segue chapter, *Cellular Automata Algorithms for Digital Image Processing* by Petre Anghelescu.

Section 2, “Tools and Technologies,” presents extensive coverage of the various tools and technologies used in the implementation of Biometrics. Section 2 begins where Section 1 left off, though this section describes more concrete tools at place in the modeling, planning, and applications of Biometrics. The first chapter, *Image Data Mining Based on Wavelet Transform for Visualization of the Unique Characteristics of Image Data* by Gebeyehu Belay Gebremeskel, Yi Chai, Zhou Shangbo, and Su Xu, lays a framework for the types of works that can be found in this section. The section concludes with *iCellFusion: Tool for Fusion and Analysis of Live-Cell Images from Time-Lapse Multimodal Microscopy* by João Santinha, Leonardo Martins, Antti Häkkinen, Jason Lloyd-Price, Samuel M. D. Oliveira, Abhishekh Gupta, Teppo
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Annila, Andre Mora, Andre S. Ribeiro, and Jose Ribeiro Fonseca. This section described specific tools and technologies at the disposal of practitioners, the next section describes the use and applications of the tools and frameworks discussed in previous sections.

Section 3, “Utilization and Application,” describes how the broad range of Biometrics efforts has been utilized and offers insight on and important lessons for their applications and impact. The first chapter in the section is titled Multiple Description Coding for Multipath Video Streaming written by Pedro Correia, Pedro A. Amado Assuncao, and Vitor Silva. This section includes the widest range of topics because it describes case studies, research, methodologies, frameworks, architectures, theory, analysis, and guides for implementation. The breadth of topics covered in the chapter is also reflected in the diversity of its authors, from countries all over the globe. The section concludes with A Hybrid Scheme for Breast Cancer Detection using Intuitionistic Fuzzy Rough Set Technique by Chiranji Lal Chowdhary and D. P. Acharjya, a great transition chapter into the next section.

Section 4, “Organizational and Social Implications,” includes chapters discussing the organizational and social impact of Biometrics. The section opens with Comparative Analysis of Efficient Platforms: Scalable Algorithms and Parallel Paradigms for Large Scale Image Processing by Khawaja Tehseen Ahmed, Mazhar Ul-Haq, Arsalan Ahmed Shaikh, and Raihan ur Rasool. Where Section 3 focused on the broad, many applications of Biometrics technology, this section focuses exclusively on how these technologies affect human lives, either through the way they interact with each other, or through how they affect behavioral/workplace situations. The section concludes with Dataveillance in the Workplace: Privacy Threat or Market Imperative? by Regina Connolly.

Section 5, “Critical Issues,” presents coverage of academic and research perspectives on Biometrics tools and applications. The section begins with Biometric Security by Muzhir Shaban Al-Ani. Chapters in this section will look into theoretical approaches and offer alternatives to crucial questions on the subject of Biometrics. The section concludes with Veillance: Beyond Surveillance, Dataveillance, Ubervellance, and the Hypocrisy of One-Sided Watching by Steve Mann.

Section 6, “Emerging Trends,” highlights areas for future research within the field of Biometrics, opening with Improving the Security of Digital Images in Hadamard Transform Domain Using Digital Watermarking by V. Santhi and D. P. Acharjya. This section contains chapters that look at what might happen in the coming years that can extend the already staggering amount of applications for Biometrics. The final chapter of the book, Advances in Biometrics for Secure Human Authentication System: Biometric Authentication System by Jagannath Mohan, Adalarasu Kanagasabai, and Vetrivelan Pandu, looks at an emerging field within Biometrics.

Although the primary organization of the contents in this multi-volume work is based on its six sections, offering a progression of coverage of the important concepts, methodologies, technologies, applications, social issues, and emerging trends, the reader can also identify specific contents by utilizing the extensive indexing system listed at the end of each volume. As a comprehensive collection of research on the latest findings related to using technology to providing various services, Biometrics: Concepts, Methodologies, Tools and Applications, provides researchers, administrators and all audiences with a complete understanding of the development of applications and concepts in Biometrics. Given the vast number of issues concerning usage, failure, success, policies, strategies, and applications of Biometrics in countries around the world, Biometrics: Concepts, Methodologies, Tools and Applications addresses the demand for a resource that encompasses the most pertinent research in technologies being employed to globally bolster the knowledge and applications of Biometrics.