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Segmentation and Separation of Overlapped Latent Fingerprints

Algorithms, Techniques, and Datasets

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B.S.: To the memory of my father.
O.M.: For Ingrid, with love and appreciation.
A.N.: For George and Milan—my lovely kids.

Preface

The field of biometrics is well situated in the research community and has intrigued researchers for many years. Although there are numerous biometric modalities in use today, fingerprints remain the dominant one, because of its noninvasive nature and ease of applicability. This is especially important when it comes to security and forensic applications. A very challenging task in fingerprint recognition is overlapped latent fingerprint processing, which includes segmentation and separation processes prior to (individual) fingerprints matching.

This book presents an overview of problems and technologies behind segmentation and separation of overlapped latent fingerprints. Written from a technical perspective, and yet using language and terminology accessible to non-experts, it describes the technologies, introduces relevant datasets, highlights the most important research results in each area, and outlines the most challenging open research questions.

It is targeted at a scientific audience and enthusiasts interested in the field of fingerprints matching, in particular, and biometrics, in general. By offering a structured overview of the most important approaches currently available, putting them in perspective, and suggesting numerous resources for further exploration, the book gives its readers a clear path for learning new topics and engaging in related research.

We expect that the book will fulfill its goal of serving as a preliminary reference on the subject. Readers who want to deepen their understanding of specific topics will find more than 100 references to additional sources of related information.

We want to express our gratitude to the Vlatacom Research and Development Institute, Belgrade, Serbia—management, scientific council, and personnel—for their encouragement and support during overlapped latent fingerprint research process and writing this book.

This book represents a part of the doctoral dissertation of Dr. Branka Stojanović at the School of Electrical Engineering, University of Belgrade. It is also one of the results of a joint research project between Florida Atlantic University and Vlatacom Research and Development Institute.