

Foreword

Over the last 13 years, recognition processes involving the use of biometric technology have received increasing interest from both the scientific community and ICT industrial companies. One of the reasons is because, with the increased integration of computers and Internet into our everyday lives, it is necessary to protect sensitive and personal data as well as access to critical services. The main factor spurring the adoption of biometric identification is that it offers several advantages over traditional methods using ID cards (tokens) or PIN numbers (passwords). Indeed, unlike biometric traits, PINs or passwords may be forgotten or suffer sniffing as well as cracking attacks, while passports and drivers' licenses may be forged, stolen, or lost. The combination of biometrics and PINs can potentially prevent unauthorized physical or logical access in a more robust way.

The selection of a particular biometrics for use in a specific application involves a weighting of several factors, and usually no single biometric trait will meet all the requirements of every possible application. As a result, biometric systems, deployed to enhance security and reduce fraud in real-time recognition, can handle various traits, separately or in multimodal architectures, as for example face, iris, and fingerprint. Among those biometrics, face seems to be the weaker one even if it is the easiest to collect.

Face is a dynamic biometrics whose anatomic elements can change both rapidly, on the time scale of seconds during modification of expression and/or pose and/or illumination, and more slowly over time due to ageing. Despite this, identification frameworks involving the use of face recognition technology are expanding rapidly worldwide. Some respond to specific needs, such as in forensics for criminal identification. However, the recent progresses in both biometric sensors and detection/recognition algorithms have led to the deployment of several systems based on face recognition in a large number of civilian and government applications. Those include computer log-in/log-off, financial transactions, international border crossing, national ID cards, physical access control, and welfare disbursement, just to cite a few. The above considerations have inspired this book.

Although a lot of books, monographs, journal special issues, surveys, and papers on face recognition have been and continue to be published, demonstrating an ever-growing interest of the scientific community from one side, and the continuous advancements and new achievements on the other side, this book provides an innovative perspective that analyzes the theoretical and practical aspects of the problem. In this scenario, the interest of the research has focused on the new frontier of face recognition, where degraded data are acquired in the visible wavelength and uncontrolled setups, with subjects moving and with possibly widely varying capture distance, expression, pose, illumination, and resolution.

Recently, several progresses have been achieved in face recognition, and the chapters of this book demonstrate this. In practice, as you can read in the book, modern deployed face recognition systems have proven their effectiveness and robustness in relatively uncontrolled scenarios, exploiting interoperability among different capture devices operating with different resolution and sometimes combining 2D and 3D modalities.

The editors' efforts were therefore focused on selecting a collection of contributions from leading researchers in the context of face recognition in order to cover all the topics that I believe are the most challenging. Therefore, in my opinion, the theoretical and practical results reported here form the basis for current and future research on face-based identification, so they can serve as a point of reference for both young researchers, who approach biometrics for the first time, as well as for experts.

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Mislav Grgic received B.Sc., M.Sc., and Ph.D. degrees in electrical engineering from the University of Zagreb, Faculty of Electrical Engineering and Computing (FER), Zagreb, Croatia, in 1997, 1998, and 2000, respectively. Since July 1997, he has worked at the Department of Wireless Communications at FER. He was a visiting researcher at the University of Essex, Colchester, United Kingdom (1999-2000). In June 2010, he was promoted to Full Professor. Since October 2010, he has served as a Vice Dean for Research at FER. He has participated in several scientific projects and published more than 180 papers in books, journals, and conference proceedings in the area of image and video compression, content-based image retrieval, face recognition, and digital mammography (computer-aided detection and diagnosis of breast cancer). Prof. Grgic is a full member of the Croatian Academy of Engineering (HATZ).