



Foundations and Opportunities of Biometrics

A Guide to Technology, Applications,
and Regulations

Dario Salice
Jennifer Salice

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For our daughter, Anna.

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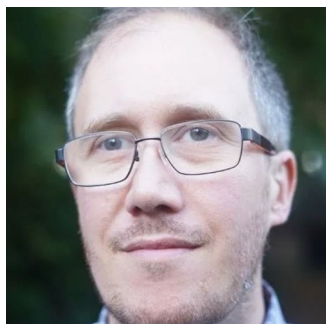
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About the Authors



Dario Salice is a technologist with over 20 years of experience in a broad range of roles. Originally from Switzerland, he spent time living and working in Silicon Valley before moving to the United Kingdom. His previous employers include Swisscom, Google, and Facebook/Meta, where he held roles around product management and cybersecurity. Dario represented Facebook/Meta on the board of the FIDO Alliance—an industry standardization body for authentication. Currently working as a freelance technologist, Dario consults with organizations on product development and cybersecurity.



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Massimo Nardone has more than 22 years of experience in security, web and mobile development, cloud, and IT architecture. His true IT passions are security and Android. He has been programming and teaching how to program with Android, Perl, PHP, Java, VB, Python, C/C++, and MySQL for more than 20 years. Massimo also holds a Master of Science degree in computing science from the University of Salerno, Italy. He has worked as a project manager, software engineer, research engineer, chief security architect, information security manager, PCI/SCADA auditor, and senior lead IT security/cloud/SCADA architect for many years. His technical skills include security, Android, cloud, Java, MySQL, Drupal, Cobol, Perl, web and mobile development, MongoDB, D3, Joomla, Couchbase, C/C++, WebGL, Python, Pro Rails, Django CMS, Jekyll, Scratch, etc. Massimo currently works as Chief Information Security Officer (CISO) for Cargotec Oyj. He worked as visiting lecturer and supervisor for exercises at the Networking Laboratory of the Helsinki University of Technology (Aalto University). He holds four international patents (PKI, SIP, SAML, and proxy areas).

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Introduction

Your phone scans your face to give you access. Your laptop uses your fingerprint. Your smart speaker recognizes your voices and answers questions based on which user asked them. These are just a few of the ways biometric data is used in our everyday lives. In your personal and professional life, you might encounter situations where a good understanding of biometrics smoothes communication and helps create shared understanding with your peers.

The idea of writing this book came a few years ago when Dario began teaching an introductory module about Biometrics at HWZ in Switzerland. The module was part of a larger course titled “Disruptive Technologies,” in which professionals in non-technical roles learned about the basics of disruptive technologies.

Welcome to this book about biometric data. The purpose of this book is to provide you with a foundational understanding of what biometrics are, what they’re used for, how they work, and the limitations and responsibilities of using them. We hope that it will give you insights you expected and surprise you in other ways. We wanted to create a foundational book to help readers connect the dots between buzzwords, technology, risks, and opportunities. We hope this book proves useful in providing you with a solid overview of the topic.

Visit biometrics.jenario.com for information about this.

PART I

Laying the Foundation

CHAPTER 1

The Growing Use of Biometrics

Did you know? If you visit someone or deliver to a US home, there's a 16%¹ chance that your face will be detected and analyzed by a video-enabled doorbell.

The use of biometrics in our lives is increasing exponentially. For the vast majority of us, our biometric data is being used multiple times each day. In this chapter, we will look at the path biometrics has taken through science fiction and historical use to bring us to our current-day experience with biometric data.

Biometrics in Film and Literature

Long before we could open our phones by scanning our face, we dreamed of the possibilities our particular body signals might unlock. As with many other technologies and innovations, the idea of using human characteristics to solve problems of security, access, and a host of others

¹ Prevalence of video-enabled doorbell cameras in the US: www.telecompetitor.com/video-doorbell-research-amazon-ring-tops-in-market-share-with-16-of-households-opting-in.