

Handbook of Face Recognition

Stan Z. Li • Anil K. Jain
Editors

Handbook of Face Recognition

Second Edition

 Springer

Editors

Stan Z. Li
Institute of Automation, Center Biometrics
Research & Security
Chinese Academy of Science
Room 1227, No. 95 Zhongguancun East Rd
Beijing 100190
People's Republic of China
szli@cbsr.ia.ac.cn

Anil K. Jain
Dept. Computer Science & Engineering
Michigan State University
East Lansing, MI 48824-1226
USA
jain@cse.msu.edu

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Preface

Face recognition is one of the most important abilities that we use in our daily lives. There are several reasons for the growing interest in automated face recognition, including rising concerns for public security, the need for identity verification for physical and logical access, and the need for face analysis and modeling techniques in multimedia data management and digital entertainment. Research in automatic face recognition started in the 1960s. Recent years have seen significant progress in this area and a number of face recognition and modeling systems have been developed and deployed. However, accurate and robust face recognition still offers a number of challenges to computer vision and pattern recognition researchers, especially under unconstrained environments.

This book is written with two primary motivations. The first is to compile major approaches, algorithms, and technologies available for automated face recognition. The second is to provide a reference book to students, researchers, and practitioners.

The book is intended for anyone who plans to work in face recognition or who wants to become familiar with the state-of-the-art in face recognition. It also provides references for scientists and engineers working in image processing, computer vision, biometrics and security, computer graphics, animation, and the computer game industry. The material contained in the book fits the following categories: advanced tutorial, state-of-the-art survey, and a guide to current technology.

This second edition consists of twenty seven chapters, with additions and updates from the sixteen chapters in the first edition. It covers all the subareas and major components necessary for developing face recognition algorithms, designing operational systems, and addressing related issues in large scale applications. Each chapter focuses on a specific topic or system component, introduces background information, reviews up-to-date techniques, presents results, and points out challenges and future directions.

The twenty seven chapters are divided into four parts according to the main problems addressed. Part I, *Face Image Modeling and Representation*, consists of ten chapters, presenting theories in face image modeling and facial feature representation. Part II, *Face Recognition Techniques*, also consists of ten chapters, presenting techniques for face detection, landmark detection, and face recognition in static face

images, in video, in non-visible spectrum images, and in 3D. Part III, *Performance Evaluation: Machines and Humans*, consists of three chapters, presenting methods and programs for face recognition evaluation and also studies and comparisons with human performance. Part IV, *Face Recognition Applications*, consists of four chapters, presenting various applications of face recognition and related issues.

A project like this requires the efforts and support of many individuals and organizations. First of all, we would like to thank all the authors for their outstanding contributions which made this edition possible. We also thank Wayne Wheeler and Simon Rees, the Springer editors for their support and patience during the course of this project. Thanks are also due to a number of individuals who have assisted us during the editing phase of this project, including Shikun Feng, Shengcai Liao, Xi-angsheng Huang, Brendan Klare, Unsang Park, Abhishek Nagar, and not the least Kim Thompson for her careful proofreading of the manuscript. Stan Z. Li would like to acknowledge the support of the Chinese National Natural Science Foundation Project #61070146, the National Science and Technology Support Program Project #2009BAK43B26, the AuthenMetric R&D Funds, and the TABULA RASA project (<http://www.tabularasa-euproject.org>) under the Seventh Framework Programme for research and technological development (FP7) of the European Union (EU), grant agreement #257289. Anil Jain's research was partially supported by the WCU (World Class University) program funded by the Ministry of Education, Science and Technology through the National Research Foundation of Korea (R31-10008) to the Brain & Cognitive Engineering Department, Korea University where he is an Adjunct Professor.

Beijing, People's Republic of China
East Lansing, USA

Stan Z. Li
Anil K. Jain

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Contributors

Mongi Abidi Imaging, Robotics, and Intelligent Systems Lab, University of Tennessee, Knoxville, TN 37996, USA, abidi@utk.edu

Jörgen Ahlberg Division of Information Systems, Swedish Defence Research Agency (FOI), P.O. Box 1165, 583 34 Linköping, Sweden, jorahl@foi.se

Brian Amberg Department of Mathematics and Computer Science, University of Basel, Bernoullistrasse 16, 4056 Basel, Switzerland, brian.amberg@unibas.ch

Heinrich H. Bühlhoff Max Planck Institute for Biological Cybernetics, Spemannstrasse 38, 72076 Tübingen, Germany, heinrich.buelthoff@tuebingen.mpg.de; Department of Brain and Cognitive Engineering, Korea University, Seoul, Korea

Simon Baker Robotics Institute, Carnegie Mellon University, Pittsburgh, PA 15213, USA, simonb@cs.cmu.edu

Ronen Basri The Weizmann Institute of Science, Rehovot 76100, Israel, ronen.basri@weizmann.ac.il

Wei Bian Centre for Quantum Computation & Intelligence Systems, FEIT, University of Technology, Sydney, NSW 2007, Australia, wei.bian@student.uts.edu.au

Volker Blanz Universität Siegen, Hölderlinstrasse 3, 57068 Siegen, Germany, blanz@mpi-sb.mpg.de

Michael Brauckmann L-1 Identity Solutions AG, Bochum, Germany, MBrauckmann@l1id.com

Christoph Busch Hochschule Darmstadt/Fraunhofer IGD, Darmstadt, Germany, christoph.busch@igd.fraunhofer.de

Hong Chang Imaging, Robotics, and Intelligent Systems Lab, University of Tennessee, Knoxville, TN 37996, USA, hchang2@utk.edu

Rama Chellappa Department of Electrical and Computer Engineering, Center for Automation Research, University of Maryland, College Park, MD 20742, USA, rama@umiacs.umd.edu

D. Chu Computational Biomedicine Lab, Department of Computer Science, University of Houston, Houston, TX 77204, USA

Jeffrey F. Cohn Department of Psychology, University of Pittsburgh, Pittsburgh, PA 15260, USA, jeffcohn@pitt.edu

Tim Cootes Imaging Science and Biomedical Engineering, University of Manchester, Manchester, UK, t.cootes@man.ac.uk

Douglas W. Cunningham Max Planck Institute for Biological Cybernetics, Spemannstrasse 38, 72076 Tübingen, Germany, douglas.cunningham@tu-cottbus.de; Brandenburg Technical University, 03046 Cottbus, Germany

Xiaoqing Ding State Key Laboratory of Intelligent Technology and Systems, Tsinghua National Laboratory for Information Science and Technology, Department of Electronic Engineering, Tsinghua University, Beijing 100084, China, dingxq@tsinghua.edu.cn

Ming Du Department of Electrical and Computer Engineering, Center for Automation Research, University of Maryland, College Park, MD 20742, USA, mingdu@umiacs.umd.edu

E. Efraty Computational Biomedicine Lab, Department of Computer Science, University of Houston, Houston, TX 77204, USA

Ralph Gross Robotics Institute, Carnegie Mellon University, Pittsburgh, PA 15213, USA, rgross@cs.cmu.edu

Patrick Grother National Institute of Standards and Technology, Gaithersburg, MD 20899, USA, pgrother@nist.gov

Baining Guo Microsoft Research Asia, Beijing 100080, China, bainguo@microsoft.com

Abdenour Hadid Machine Vision Group, Department of Electrical and Information Engineering, University of Oulu, P.O. Box 4500, 90014 Oulu, Finland, hadid@ee.oulu.fi

Thomas Huang University of Illinois at Urbana-Champaign, Urbana, IL 61801, USA, huang@ifp.uiuc.edu

David Jacobs University of Maryland, College Park, MD 20742, USA, djacobs@umiacs.umd.edu

Anil K. Jain Michigan State University, East Lansing, MI 48824, USA, jain@cse.msu.edu

I.A. Kakadiaris Computational Biomedicine Lab, Department of Computer Science, University of Houston, Houston, TX 77204, USA, ioannisk@grip.cis.upenn.edu

Takeo Kanade Robotics Institute, Carnegie Mellon University, Pittsburgh, PA 15213, USA, tk@cs.cmu.edu

Reinhard Knothe Department of Mathematics and Computer Science, University of Basel, Bernoullistrasse 16, 4056 Basel, Switzerland, reinhard.knothe@unibas.ch

Andreas Koschan Imaging, Robotics, and Intelligent Systems Lab, University of Tennessee, Knoxville, TN 37996, USA, akoschan@utk.edu

Joni-Kristian Kämäräinen Machine Vision and Pattern Recognition Laboratory, Lappeenranta University of Technology, Lappeenranta, Finland, Joni.Kamarainen@lut.fi

Stan Z. Li Center for Biometrics and Security Research & National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, Beijing, China, szli@cbsr.ia.ac.cn

Xiaoming Liu Visualization and Computer Vision Lab, GE Global Research, Niskayuna, NY 12309, USA, liux@ge.com

Zicheng Liu Microsoft Research, Redmond, WA 98052, USA, zliu@microsoft.com

J. Birgitta Martinkauppi Department of Electrical Engineering and Automation, University of Vaasa, Wolffintie 34, 65101 Vaasa, Finland, birmar@uwasa.fi

Iain Matthews Robotics Institute, Carnegie Mellon University, Pittsburgh, PA 15213, USA, ianm@cs.cmu.edu

Ross Micheals National Institute of Standards and Technology, Gaithersburg, MD 20899, USA, rossm@nist.gov

Baback Moghaddam Mitsubishi Electric Research Labs, Cambridge, MA 02139, USA, baback@merl.com

Alice J. O'Toole School of Behavioral and Brain Sciences, The University of Texas at Dallas, 800 W. Campbell Rd., Richardson, TX 75083-0688, USA, otoole@utdallas.edu

Igor S. Pandzic Faculty of Electrical Engineering and Computing, University of Zagreb, Unska 3, 10000 Zagreb, Croatia, igor.pandzic@fer.hr

Sharathchandra Pankanti IBM Research, Yorktown Heights, NY 10598, USA, sharat@us.ibm.com

Unsang Park Michigan State University, East Lansing, MI 48824, USA, parkunsa@cse.msu.edu

G. Passalis Computational Biomedicine Lab, Department of Computer Science, University of Houston, Houston, TX 77204, USA; Computer Graphics Laboratory, Department of Informatics and Telecommunications, University of Athens, Ilisia 15784, Greece

P. Perakis Computational Biomedicine Lab, Department of Computer Science, University of Houston, Houston, TX 77204, USA; Computer Graphics Labora-

tory, Department of Informatics and Telecommunications, University of Athens, Ilisia 15784, Greece

Vladimir Petrović Imaging Science and Biomedical Engineering, University of Manchester, Manchester, UK

P. Jonathon Phillips National Institute of Standards and Technology, Gaithersburg, MD 20899, USA, jonathon@nist.gov

Matti Pietikäinen Machine Vision Group, Department of Electrical and Information Engineering, University of Oulu, P.O. Box 4500, 90014 Oulu, Finland, mkp@ee.oulu.fi

Sami Romdhani Department of Mathematics and Computer Science, University of Basel, Bernoullistrasse 16, 4056 Basel, Switzerland, sami.romdhani@unibas.ch

Andrew W. Senior Google Research, New York, NY 10011, USA, andrewsenior@google.com

S. Shah Computational Biomedicine Lab, Department of Computer Science, University of Houston, Houston, TX 77204, USA

Gregory Shakhnarovich Computer Science and Artificial Intelligence Laboratory, MIT, Cambridge, MA 02139, USA, gregory@ai.mit.edu

Nicole A. Spaun Forensic Audio, Video and Image Analysis Unit, Federal Bureau of Investigation, Quantico, VA, USA, Nicole.Spaun@us.army.mil; United States Army Europe Headquarters, Heidelberg, Germany; USAREUR, CMR 420, Box 2872, APO AE 09036, USA

Dacheng Tao Centre for Quantum Computation & Intelligence Systems, FEIT, University of Technology, Sydney, NSW 2007, Australia, dacheng.tao@uts.edu.au

Chris Taylor Imaging Science and Biomedical Engineering, University of Manchester, Manchester, UK

T. Theoharis Computational Biomedicine Lab, Department of Computer Science, University of Houston, Houston, TX 77204, USA; Computer Graphics Laboratory, Department of Informatics and Telecommunications, University of Athens, Ilisia 15784, Greece

Yingli Tian Department of Electrical Engineering, The City College of New York, New York, NY 10031, USA, ytian@ccny.cuny.edu

G. Toderici Computational Biomedicine Lab, Department of Computer Science, University of Houston, Houston, TX 77204, USA

Phil Tresadern Imaging Science and Biomedical Engineering, University of Manchester, Manchester, UK

Peter H. Tu Visualization and Computer Vision Lab, GE Global Research, Niskayuna, NY 12309, USA, tu@ge.com

Pavan Turaga Department of Electrical and Computer Engineering, Center for Automation Research, University of Maryland, College Park, MD 20742, USA, pturaga@umiacs.umd.edu

Thomas Vetter Department of Mathematics and Computer Science, University of Basel, Bernoullistrasse 16, 4056 Basel, Switzerland, thomas.vetter@unibas.ch

Christian Wallraven Max Planck Institute for Biological Cybernetics, Spemannstrasse 38, 72076 Tübingen, Germany, wallraven@korea.ac.kr; Department of Brain and Cognitive Engineering, Korea University, Seoul, Korea

Liting Wang State Key Laboratory of Intelligent Technology and Systems, Tsinghua National Laboratory for Information Science and Technology, Department of Electronic Engineering, Tsinghua University, Beijing 100084, China, wangltmail@tsinghua.edu.cn

Yang Wang Carnegie Mellon University, Pittsburgh, PA 15213, USA, wangy@cs.cmu.edu

Frederick W. Wheeler Visualization and Computer Vision Lab, GE Global Research, Niskayuna, NY 12309, USA, wheeler@ge.com

Jianxin Wu School of Computer Engineering, Nanyang Technological University, Singapore, Singapore, jxwu@ntu.edu.sg

Ziyou Xiong United Technologies Research Center, East Hartford, CT 06108, USA, xiongz@utrc.utc.com

Yi Yao Visualization and Computer Vision Lab, GE Global Research, Niskayuna, NY 12309, USA, yi.yao@ge.com

Dong Yi Center for Biometrics and Security Research & National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, Beijing, China, dyi@cbsr.ia.ac.cn

Zhenqiu Zhang University of Illinois at Urbana-Champaign, Urbana, IL 61801, USA, zzhang6@uiuc.edu

Shaohua Kevin Zhou Siemens Corporate Research, 755 College Road East, Princeton, NJ 08540, USA, kzhou@scr.siemens.com