

Lecture Notes in Computer Science

2683

Edited by G. Goos, J. Hartmanis, and J. van Leeuwen

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Anand Rangarajan Mário Figueiredo
Josiane Zerubia (Eds.)

Energy Minimization Methods in Computer Vision and Pattern Recognition

4th International Workshop, EMMCVPR 2003
Lisbon, Portugal, July 7-9, 2003
Proceedings



Springer

Series Editors

Gerhard Goos, Karlsruhe University, Germany
Juris Hartmanis, Cornell University, NY, USA
Jan van Leeuwen, Utrecht University, The Netherlands

Volume Editors

Anand Rangarajan
University of Florida
Dept. of Computer and Information Science and Engineering
Gainesville, FL, US 32611-6120, USA
E-mail: anand@cise.ufl.edu

Mário Figueiredo
Instituto Superior Técnico
Torre Norte, Piso 10, Av. Rovisco Pais, 1049-001 Lisboa, Portugal
E-mail: Mario.Figueiredo@lx.it.pt

Josian Zerubia
INRIA
Sophia-Antipolis, France
E-mail: Josiane.Zerubia@sophia.inria.fr

Cataloging-in-Publication Data applied for

A catalog record for this book is available from the Library of Congress

Bibliographic information published by Die Deutsche Bibliothek
Die Deutsche Bibliothek lists this publication in the Deutsche Nationalbibliografie;
detailed bibliographic data is available in the Internet at <<http://dnb.ddb.de>>.

CR Subject Classification (1998): I.5, I.4, I.2.10, I.3.5, F.2.2, F.1.1

ISSN 0302-9743

ISBN 3-540-40498-8 Springer-Verlag Berlin Heidelberg New York

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Springer-Verlag Berlin Heidelberg New York
a member of BertelsmannSpringer Science+Business Media GmbH

<http://www.springer.de>

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Printed in Germany

Typesetting: Camera-ready by author, data conversion by DA-TeX Gerd Blumenstein
Printed on acid-free paper SPIN 10927793 06/3142 5 4 3 2 1 0

Preface

This volume consists of the 33 papers presented at the International Workshop on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR 2003) which was held at Instituto Superior Técnico (IST), the Engineering School of the Technical University of Lisbon, Portugal during July 7–9, 2003. This workshop was the fourth in the series which started with EMMCVPR 1997 held in Venice, Italy in May 1997 and continued with EMMCVPR 1999 held in York, UK in July 1999 and EMMCVPR 2001 held in Sophia-Antipolis, France in September 2001.

Many problems in computer vision and pattern recognition (CVPR) are couched in the framework of optimization. The minimization of a global quantity, often referred to as the energy, forms the bulwark of most approaches in CVPR. Disparate approaches, such as discrete and probabilistic formulations on the one hand and continuous, deterministic strategies on the other, often have optimization or energy minimization as a common theme. Instances of energy minimization arise in Gibbs/Markov modeling, Bayesian decision theory, geometric and variational approaches and in areas in CVPR such as object recognition and retrieval, image segmentation, registration, reconstruction, classification and data mining.

The aim of the EMMCVPR workshops is to bring together researchers with interests in these disparate areas of CVPR but with an underlying commitment to some form of energy minimization. Although the subject is traditionally well represented in major international conferences on CVPR, this workshop provides a forum wherein researchers can report their recent work and engage in more informal discussions.

We received 66 submissions, from 23 countries, each of which was reviewed by three members of the program committee and the co-chairs. Based on the reviews, 24 papers were accepted for oral presentation and 9 for poster presentation. In this volume, no distinction is made between papers that were presented orally or as posters. The book is organized into six sections with section titles corresponding to the workshop sessions: *Unsupervised Learning and Matching*, *Probabilistic Modelling*, *Segmentation and Grouping*, *Shape Modelling*, *Restoration and Reconstruction*, and *Graphs and Graph-Based Methods*.

EMMCVPR 2003 also included keynote talks by three distinguished scientists: William Freeman (MIT), Alfred Hero (Univ. of Michigan), and Panos Pardalos (Univ. of Florida). The invited talks focused on recent results in the areas of Bayesian networks, entropy-based methods and global optimization, respectively. These researchers have played leading roles in the fields of optimization, computer vision, image processing and pattern recognition.

We would like to thank Marcello Pelillo and Edwin Hancock for their pioneering efforts in launching this series of successful workshops with EMMCVPR 1997 and for much subsequent advice, organizational tips and encouragement.

We also thank Anil Jain (co-chair of EMMCVPR 2001) for his support. We thank the program committee for careful and timely reviews which made our task easier.

We acknowledge and thank the following organizations that have provided support for EMMCVPR: the International Association for Pattern Recognition (IAPR) for sponsoring the workshop and providing publicity, Instituto Superior Técnico (IST) for hosting the workshop, Instituto de Telecomunicações (IT) for providing organizational support, and finally Springer-Verlag for including EMMCVPR under the LNCS rubric.

May 2003

Anand Rangarajan
Mário Figueiredo
Josiane Zerubia

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