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Energy Minimization Methods in Computer Vision and Pattern Recognition

5th International Workshop, EMMCVPR 2005
St. Augustine, FL, USA, November 9-11, 2005
Proceedings

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Preface

This volume consists of the 42 papers presented at the International Workshop on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR 2005), which was held at the Hilton St. Augustine Historic Bayfront, St. Augustine, Florida, USA, during November 9–11, 2005. This workshop is the fifth in a series which began with EMMCVPR 1997 held in Venice, Italy, in May 1997 and continued with EMMCVPR 1999 held in York, UK, in July 1999, EMMCVPR 2001 held in Sophia-Antipolis, France, in September 2001 and EMMCVPR 2003 held in Lisbon, Portugal, in July 2003.

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 this workshop was to bring together researchers with interests in these disparate areas of CVPR but with an underlying commitment to some form of not only energy minimization but global optimization in general. Although the subject is traditionally well represented in major international conferences on CVPR, recent advances—information geometry, Bayesian networks and graphical models, Markov chain Monte Carlo, graph algorithms, implicit methods in variational approaches and PDEs—deserve an informal and focused hearing in a workshop setting.

We received 120 submissions 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 18 for poster presentation. In this volume, no distinction is made between papers that were presented orally or as posters. EMMCVPR from its inception has focused on complementary (but sometimes adversarial) optimization approaches to image analysis—both in problem formulation and in solution methodologies. This “coopetition” is depicted as a mandala in Fig. 1.

The book is organized into four sections with the section titles being *Probabilistic and Informational Approaches*, *Combinatorial Approaches*, *Variational Approaches* and *Other Approaches and Applications*. The section titles follow the basic categories depicted in Figure 1 with the title “Other Approaches” used to lump together methodologies that do not easily fit into the above opponent-quadrant format.

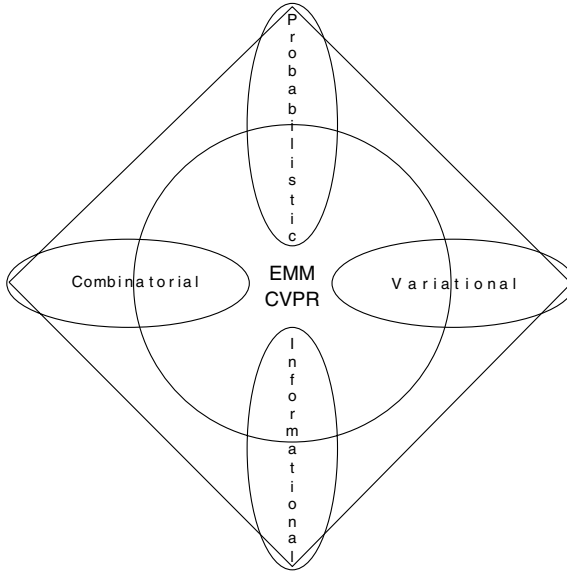


Fig. 1. The four dominant approaches to EMMCVPR arranged in an opponent-quadrant format

EMMCVPR 2005 also included keynote talks by three distinguished scientists: David Mumford (Brown University, USA), Christopher Small (University of Waterloo, Canada), and Demetri Terzopoulos (New York University, USA). The invited talks spanned the areas of differential geometry, shape analysis and deformable models. These three researchers have played leading roles in the fields of algebraic geometry, shape theory and image analysis, respectively.

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), Josiane Zerubia (Co-chair of EMMCVPR 2001 and EMMCVPR 2003) and Mário Figueiredo (Co-chair of EMMCVPR 2001 and EMMCVPR 2003) for their support. We thank the Program Committee (and numerous un-named graduate students and postdocs who were drafted as reviewers in the 11th hour) for careful and timely reviews which made our task easier.

We acknowledge and thank the University of Florida for providing organizational and financial support to EMMCVPR 2005, the International Association of Pattern Recognition (IAPR) for sponsoring the workshop and providing publicity, and finally Springer for including EMMCVPR under the LNCS rubric.

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