Guest Editorial

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This issue of JMIV is the result of a Call For Papers sent to all selected speakers of the fifth conference on Mathematics and Image Analysis (MIA'04) which took place in Paris on September 6–9, 2004. The first two meetings were organized in Luminy, near Marseilles, France, in November 1997 and April 1999 and the third and fourth in Paris in September 2000 and 2002. These conferences were initiated by the committee of the CNRS French research cluster called GDR MSPC, for Mathematics of Cognitive and Perceptive Systems, created by Robert Azencot (ENS Cachan). The first two conferences were organized mainly by Laurent Younes (then at ENS Cachan), Alain Trouvé (then at University Paris 13), and myself.

Since MIA'00, the conferences took a larger scale. For MIA'04, we also had as sponsors INRIA, GET, Thales Air Defence and DGA. There were about 200 participants attending the 29 talks, among which eight long talks. Most participants were from France, but half of the speakers were from other countries in Europe, Israel and USA. The Organizing Committee of MIA'04 was composed of Frédéric Barbaresco (Thales), Laurent Cohen (Ceremade, University Paris Dauphine), Rachid Deriche (INRIA), Nicolas Rougon (INT), Alain Trouvé (ENS Cachan) and Laurent Younes (Johns Hopkins). The complete list of speakers with abstracts and program committee is available on the web site http://www.ceremade.dauphine.fr/∼cohen/mia2004.

The goal of these conferences and the research cluster (GDR) behind is to enhance a trend which started about 15 years ago to give a mathematical framework to many fields of computer vision. This involves nowadays researchers all around the world at the interface between applied mathematics and new developments in various areas of computer vision and Image Processing.

Concerning this special issue, all papers submitted were reviewed as usual for JMIV by two referees, and nine papers were selected. We thank by the way all the referees that helped in the editorial work to realize this special issue. The papers presented make use of variational methods and Partial Differential Equations or Statistical Methods. Various problems solved mainly with variational methods and PDE's are presented in the first six papers dealing with surface segmentation, shape from shading, shape matching, shape analysis, zooming and segmentation and tracking. The next two papers bring new contributions to motion analysis. The last paper is motivated by the processing of Diffusion Tensor MRI.

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