Summer School and Workshop on Imaging Sciences and Medical Applications

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The *Summer School and Workshop on Imaging Sciences and Medical Applications* was an initiative of the UTAustin|Portugal Program, for Mathematics, in partnership with CIM (Center for International Mathematics). It took place at the Department of Mathematics at the University of Coimbra Faculty of Sciences and Technology, in Coimbra, Portugal, on June 15-23, 2010. This event had also the scientific support of CMUC (Centre for Mathematics, University of Coimbra), and two Portuguese medical associations, the *Brain Imaging Network* and the *Society of Digestive Endoscopy*.

The choice of the topic (and, *a posteriori*, its location) was motivated by the fact that, currently, we have a research project (reference UTAustin/MAT/0009/2008), in the framework of the UTAustin|Portugal Program (for Mathematics), and one of the project main subjects is precisely image processing of medical images, more exactly, endoscopic images in gastroenterology. Moreover, this *Summer School and Workshop on Imaging Sciences and Medical Applications* was also, in some sense, a natural consequence (and a continuation) of the *Workshop on Mathematical Aspects of Imaging, Modeling and Visualization in Multiscale Biology*, in which we were directly and strongly involved, and that took place at the ICES (Institute for Computational Engineering and Sciences), of the University of Texas, at Austin, USA, from March 31st to April 4th 2009.

The main goal of the *Summer School and Workshop on Imaging Sciences and Medical Applications* was, obviously, to promote new collaborations, to exchange and share new ideas and scientific results, and simultaneously, to give an opportunity to PhD students and young researchers for improving their scientific knowledge, in such a complex area as imaging sciences, which has strong interdisciplinary features.

The *Summer School* featured five excellent short courses, each one with the duration of five hours, presented by brilliant speakers, experts in imaging sciences: *Image segmentation*, by Sung Ha Kang (Georgia Institute of Technology, Atlanta, USA), *Flexible algorithms for image registration*, by Jan Modersitzki (McMaster University, Canada), *Image reconstruction in tomography*, by Alfred K. Louis (Saarland University, Germany), *Highly accurate image restoration and matching*, by Andrés Almansa (Télécom Paris Tech, France), and *Variational models in image inpainting*, by Selim Esedöglu (University of Michigan, USA).

In the *Workshop* there were nine plenary lectures, with a predominance of Portuguese guest speakers : *Interest point detection and matching for 3D reconstruction in medical endoscopy*, by João Pedro Barreto (University of Coimbra, Portugal), *Unmixing of positive sources in hyperspectral imaging*, by José Bioucas (Instituto Superior Técnico, Lisbon, Portugal), *From models of brain function to clinical applications: new challenges in neuroimaging*, by Miguel Castelo-Branco (University of Coimbra, Portugal), *CAGE - Computer assisted gastroenterology examination*, by Miguel Coimbra (University of Porto, Portugal), *A combinatorial point of view for non-linear evolutions*, by Jérôme Darbon (Ecole Normale Supérieure de Cachan, France), *Removing non-additive noise using variable splitting and augmented lagrangian optimization*, by Mário Figueiredo (Instituto Superior Técnico, Lisbon, Portugal), *Spatially adapted regularization in total variation based image restoration*, by Michael Hintermüller (Humboldt-University of Berlin, Germany), *New trends in photogrammetry and computer vision applied to 3D city modeling and culturage heritage*, by Marc Pierrot-Deseilligny (Laboratoire MATIS, IGN, France), and *Tracking moving objects in image sequences*, by João Manuel R. S. Tavares (University of Porto, Portugal). The *Workshop* also included four sessions of contributed talks and one poster session, which gave the possibility to young researchers to report their on going work and results.

A broad audience of sixty participants attended this event. It included mathematicians, electrical and computer engineers, mechanical engineers, biomedical engineers, geographical engineers, computer scientists and a neuroscientist.

This was a remarkable event, with distinguished guest speakers, who have strongly contributed to a top level scientific atmosphere, promoting and encouraging interactions and collaborative research among all the participants.

[Note - For more information visit the event website http://www.mat.uc.pt/~isma2010/?menu=home]