

## IMAGE PROCESSING AND ANALYSIS IN BIOMEDICAL ENGINEERING

**João Manuel R. S. Tavares\***, **R. M. Natal Jorge\*** and **Yongjie Zhang<sup>†</sup>**

\*Instituto de Ciência e Inovação em Engenharia Mecânica e Engenharia Industrial, Departamento de Engenharia Mecânica, Faculdade de Engenharia, Universidade do Porto, Portugal, Rua Dr Roberto Frias s/n, 4200-265 - Porto, Portugal, tavares@fe.up.pt, rnatal@fe.up.pt

<sup>†</sup>Carnegie Mellon University, Scaife Hall 303, 5000 Forbes Avenue, Pittsburgh, PA 15213 USA, jessicaz@andrew.cmu.edu

### MINI SYMPOSIUM PROPOSAL

**Keywords:** *Medical Imaging, Image Segmentation, Shape Reconstruction, Motion/Deformation Analysis*

#### 1 MINI SYMPOSIUM PROPOSAL

In recent years, extensive research has been performed to evaluate living structures from images, involving various areas of knowledge, as medicine, physics, mathematics, engineering and computer sciences. For instance, in biomedicine, it is possible to use computational procedures of image processing and analysis to model and visualize human organs from medical images. These procedures can have different goals, such as shape 3D reconstruction, segmentation, motion and deformation analysis, registration, simulation, enhanced visualization and biomechanical simulation.

The main goal of this symposium is to bring together researchers involved in the related fields (image acquisition, signal processing, image processing and analysis, medical imaging, scientific visualization, software development, grid computing, etc.), in order to set the major lines of development for the near future.

Therefore, the proposed symposium will consist of researchers representing various fields related to computational vision, computer graphics, computational mechanics, mathematics, statistics, medical imaging, biomedicine, bioengineering, etc. Thus, it endeavours to make a contribution to achieving better solutions for more realistic computational “living” models from images, and attempts to establish a bridge between clinicians, researchers and hardware manufacturers from these diverse fields.

In the symposium will be considered topics of (not limited to):

- Image Processing and Analysis in Biomedicine;
- 3D Reconstruction, Motion and Deformation Analysis based on Biomedical Images;
- Biomedical Image Acquisition and Processing;
- Visualization and Virtual Reality for Biomedicine;
- Computer Aided Diagnosis, Surgery, Therapy, Treatment and Telemedicine Systems;
- Software Development for Biomedical Images;
- Grid and High Performance Computing for Biomedical Images.