

Imaging of Biological Flows: trends and challenges

Thematic Session within VipIMAGE 2013

IV ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing

Melia Madeira Mare Hotel, Funchal, Madeira, Portugal, 14-16 October 2013

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Description

Biological flows is an interdisciplinary subject that demands an integration of several research fields such as biotechnology, engineering, medicine, chemistry, informatics and optics. Over the years, flow visualization techniques based on image processing and analysis have been applied in an effort to make the invisible visible with the help of experimental and computational technology. Hence, flow visualization techniques have become an indispensable tool to understand the flow behavior of several kinds of biological fluids (e.g. DNA solutions, blood and other physiological fluids) in living systems and biomedical devices. Doppler ultrasound, computer tomography (CT) and magnetic resonance imaging (MRI) are the most commonly used medical instruments to investigate physiological flow both in vivo and in vitro. However, due to limited spatial resolution and signal noise, it is difficult to obtain quantitative flow information. In recent years, as a result of advances in computers, optics, fluorescent probes and image analysis, several new visualization techniques have been developed. One example of success is the micro-scale particle image velocimetry (PIV) technique, which can be used to quantify the velocity field of biological flows. This thematic session will provide an opportunity to the bioengineering and biomedical community to exchange knowledge and information on the latest advances and challenges in visualization technologies and its application to biological flow research and industry. We hope to bring together researchers who are interested in the general field of flow visualization, especially in its applications to biomedical areas.

Topics of interest include (but are not restricted to):

- Biomedical Signal, Image Processing and Analysis for Biological Flows
- Visual Computing and Visualization Techniques for Biological Flows
- Diagnostic Imaging based on Biological Flow Analysis
- Cellular and Molecular Imaging
- Computational bioengineering and Biofluid Mechanics
- Cardiovascular Fluid Dynamics Analysis from Images
- Hematology, Biorheology, Hemorheology Imaging
- Biomedical devices, BioMEMS, Lab-on-chip and Microfluidics for Biological Flows Analysis

Publications

The **proceedings book** will be published by the **Taylor & Francis Group**, and indexed by **Thomson Reuters Conference Proceedings Citation Index**, **IET Inspect** and **Elsevier Scopus**.

A book with **20 invited extended works** from the most important ones presented in the conference will be published by **Springer** under the book series “[Lecture Notes in Computational Vision and Biomechanics](#)”.

A dedicated special issue of the **Taylor & Francis International Journal** “[Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization](#)” will be published with extended versions of the best works presented in VipIMAGE 2013.

Important dates

- **Submission of extended abstracts: April 15, 2013**
- Authors Notification: May 1, 2013
- Final Papers: July 1, 2013

Organizers

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