

Computer Simulations and Visualization Applied to Tissue Engineering

Thematic Session within VipIMAGE 2019

VII ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing

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Description

In recent years the tissue engineering field has been gain an important role in medicine. As shown in recent papers published in this field, there is a substantial enthusiasm surrounding the strategies and methodologies used on regenerative medicine. Generally, it is possible to divide the tissue engineering in three main areas, i. e., the Fundamentals of Tissue Engineering, Enabling Technologies, and Tissue Engineering Applications. Fundamentals of Tissue Engineering studies the properties of primary cells, stem cells, growth factors, and extracellular matrix as well as their impact on the development of tissue-engineered devices. Enabling Technologies emphases upon those approaches usually integrated into tissue-engineered devices or applied in their development. Tissue Engineering Applications comprises synthetic tissues and organs-on-chip that are presently under development for regenerative medicine applications. A common engineering methodology used when designing any kind of manufacturing process or product is the use of in silico models. These models are based on physical or mechanical equations/laws and/or experimental data, that are often used to optimize the overall process, minimize the variability, and increase both the quality and reliability of the results. The tissue engineering applications will vary from blood vessels to cartilage and bone to scaffolds.

This thematic session intends to present and discuss several modelling and visualization techniques related to the design of Tissue Engineering products and processes.

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

- Computational and visualization tools for product design in tissue engineering
- Computational and visualization tools for process design in tissue engineering
- Computational and visualization tools to study in vivo and in vitro processes
- Hyperelastic and viscoelastic modeling
- Computational methods to model scaffolds for tissue engineering
- Computational methods to analyze histological sections
- Computational methods to analyze tissue's microstructure
- Continuum modeling of in vitro tissue engineering
- Flow visualizations in tissue engineering
- Mathematical modeling of regeneration
- Modeling of vascular disease
- Computational modeling of the biomechanical behavior in cartilage and bone tissue
- Computational modeling of mass and heat transport

Publications

The **proceedings book** will be **published by Springer** under the book series "[Lecture Notes in Computational Vision and Biomechanics](#)" and **indexed by Elsevier Scopus**.

A **special issue** of the Taylor & Francis international journal "[Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization](#)", indexed in Clarivate Analytics Emerging Sources, Elsevier Scopus and dblp, **will be published**. All authors of works presented in VipIMAGE 2019 will be invited to submit an extended version to the special issue.

Important dates

- **Submission of extended abstracts: May 31, 2019** (final deadline)
- Final Papers (non-mandatory): July 15, 2019

Organizers

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