Direct Digital Fabrication in Medicine: from digital data to physical models

Thematic Session within VipIMAGE 2019

VII ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing

Porto, Portugal, 16-18 October 2019

www.fe.up.pt/vipimage

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Description

Additive manufacturing is a growing technology and has been become part of mankind's daily life, namely at a technological, economic and social level. It's a main topic of university lectures worldwide and its applied in every industrial sector, but it has been in the medical field where it's impact has increased and more and more systems are being acquired and developed for healthcare applications. A medical device is an instrument, apparatus, implant, in vitro reagent, or similar or a related article that is used to diagnose, prevent, or treat diseases or other medical conditions, and does not achieve its purposes through chemical actions within or on the body such as drugs. The main goal of any medical device is to improve the patient's daily quality of life, or well-being during diagnosis, treatment and/or medication.

Due to its capability of producing complex geometric parts directly from medical imaging data in biomedical raw materials, additive manufacturing is now considered to be a key technology that any medical clinic or hospital should have. Currently, additive manufacturing systems are being used to produce either external (prosthesis, exoskeletons, or orthosis) or internal (permanent or temporary tissue implants) medical applications.

In the production of temporary tissue implants, also designated as tissue engineering scaffolds, additive manufacturing systems have been modified to incorporate biomaterials, growth factors and pharmaceutical drugs to produce three dimensional constructs in order to proliferate and differentiate cells and produce an extra cellular matrix for either a soft or hard tissue application.

The focus of this Thematic Session within VipIMAGE 2019 is to gather together all the key players that are involved in the process from the conversion of digital medical data to physical 3D models.

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

- Medical image processing
- Medical imaging segmentation
- Voxel data conversion
- STL file processing
- STL file slicing
- Biomaterials
- Numerical simulations
- Simple biomechanical design
- Functional biomechanical design
- Biomanufacturing technologies

- Bioprinting technologies
- Additive manufacturing technologies

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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