

Computational vision and image processing applied to Dental Medicine

Thematic Session within VipIMAGE2015

V ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing

Tenerife, Canary Islands, Spain

www.fe.up.pt/vipimage

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Description

Evolution of dental imaging and computerized technologies (based on Digital Images Processing, Pattern Recognition and Artificial Intelligence techniques) applied to Dentistry has increased over the last years. Many companies have developed hardware and software based on new imaging hardware and new image processing techniques, that can be applied in any field of Dentistry, from Implantology, to Oral Surgery, Periodontology, Prosthodontics, or Orthodontics.

In the radiology field, the cone-beam CT scans (CBCT) are the latest advance, and many dental practices are using them in order to plan, for example, a prosthetic rehabilitation supported by dental implants. This hardware/software generate DICOM files that can be easily exported to dental implants planning software, or any other DICOM viewer, and in this way calculate Hounsfield Units, measure distances and dimensions of different structures, and even plan the fixed prosthetic rehabilitations that will be performed. In this way, it is possible to optimize the diagnosis and the treatment planning.

Besides radiology, images processing techniques have also advanced with optical/laser scanning of dental preparations for fixed prosthodontics, with immediately 3D reconstruction, CAD (computer aided design) and CAM (computer aided manufacturing) rehabilitations. Nowadays, many dentists and dental technicians are already using CAD-CAM systems to design and machine dental structures. This interaction between engineering techniques and dental procedures is essential in the modern dental practice.

However, the studies on this technologies applied to Dentistry are still scarce. More studies are necessary concerning the evaluation of the usability, integration and functionality in the clinical dental practice. Also, it is important to study and develop engineering / dental informatics methods and techniques, in order to evaluate and optimize the clinical treatments. These CAD-CAM dental systems allow the design and the machining of dental structures, but cannot perform (yet) stress analysis and optimization, which is easily achieved with engineering software.

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

1. Dental Radiology
2. Intra-oral scanning techniques
3. Extra-oral scanning techniques
4. CAD-CAM applied to Dentistry
5. Image processing techniques related to evaluation of oral structures
6. Dental radiology
7. Dental clinical decision support systems
8. Stress analysis techniques and optimization of oral rehabilitations

Publications

Extended abstracts (for submission): 2 to 4 (recommended) A4 pages must be considered. All extended abstracts submitted will be subjected to a review process by two members of the conference scientific committee.

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

A book with 20 invited 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 dedicated to VipIMAGE 2015.

Important dates (Postponed)

- Submission of Extended Abstracts (2-4 pages): April 20, 2015
- Authors Notification: May 15, 2015
- Deadline for Papers: July 1, 2015

Organizers

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