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Editorial

We end the year 2009, our fourth year of existence, with three state-of-the-art papers and two technical papers. In the first formal paper, Liebschner describes current efforts in identifying mechano-biological principles that are believed to guide tissue formation based on biomechanical loading. The goal of the research is to discuss a reverse engineering solution in a strategy that starts with the final product, in this case, a human trabecular bone tissue, and determines the required scaffold micro-architecture and features in order to achieve that goal. Computer models of dissected human trabecular bone samples are generated, their micro-mechanical environment analysed and results used as design goals.

In the second paper, Pouzada proposes hybrid moulds as a case of integration of alternative materials and rapid prototyping for tooling. This work reviews some of the outcomes of research activity on specific issues of manufacturing and utilisation of these tools. Most of the results refer to moulding blocks produced in epoxy composites that were manufactured using the vacuum casting technique. Some references are also made to rapid tooling techniques based on laser sintering.

Biomanufacturing in tissue engineering is the topic of review by Bartolo *et al*. In recent years, the use of rapid prototyping techniques in the fabrication of tissue engineering scaffolds has generated a lot of interest. This paper presents a state-of-the-art review of all such research activities and attempts to give a crystal ball forecast of the future trends in this growing field.

Besides the above three review papers, there are two other technical papers. In the first technical paper, Sansoni *et al.* apply both virtual and physical prototyping to facial prosthetic reconstruction by means of a 3D optical digitizer. The proposed method is illustrated by the development of a nose prosthesis and the case study of a virtual ear modelling.

Finally, Rianmora *et al.* propose an alternative approach for direct reverse engineering-rapid prototyping integration. The motivation behind their research is the presence of large point cloud data which contain redundancies that must be reduced to avoid unnecessary difficulty in subsequent surface reconstruction steps. An image-processing algorithm is developed to recommend the scanning positions based on the part complexity to minimise the number of scans.

As 2009 comes to a close, we want to thank all our contributors, readers and reviewers, and convey to all of you our best wishes for the year ahead!

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