

CALL FOR PAPERS

Special issue of Computer-Aided Design
on

Point-based Computational Techniques

Guest-editors:

Xiaoping Qian (corresponding editor), Illinois Institute of Technology, the United States
Imre Horváth, Delft University of Technology, the Netherlands

Rapidly advancing 3D sensing technologies provide us with dense and accurate point cloud data. Reverse engineering techniques are based on point clouds scanned from the real-world objects. In addition, the increasingly complex 3D geometric models, which are widely used in product development, have spurred the growing need for point-based computational techniques. Point-based computational techniques support the use of points as a basic geometric primitive in computer-aided design, analysis and manufacturing, bypassing laborious and error-prone CAD model reconstruction typically involved in the current product development processes. Research on point-based computational techniques can potentially lead to quantum-leap progress in bringing physical objects into digital space for direct engineering processing. In this emerging area, concepts from applied mathematics, computer science, and engineering are used to design computational techniques for acquiring, processing and simulating complex point-based 3D models. The growing applications of such computational techniques include product development in automotive, aerospace, biomedical, and consumer product industries, mass customization, and many other 3D sensing applications such as digital archival and animation.

Herewith we announce a Special Issue on **Point-based Computational Techniques**. Objectives are to survey and merit affording technologies, computational solutions, and best applications from an industry perspective, and to explore scientific development tracks into the future. Emphasis will be on computational techniques related to the use of points as a basic primitive in modeling, processing, analysis and application of acquired geometry. Researchers and experts from academia, government, and industry are invited to share their knowledge and experience, by submitting survey, research and application papers for this Special Issue.

We invite authors to submit fully reported and sufficiently validated papers related to, but not limited to, the following topics in point-based computational techniques:

- Point acquisition and processing
- Geometric and physical modeling using point primitives
- Sampling, approximation and interpolation
- Transmission and compression of point-sampled geometry
- Interactive techniques with point-sampled geometry
- Geometry processing of point models

- Topological properties of point clouds
- Hybrid representations and algorithms
- Point-based CAD/CAM/CAE
- Product development and other real-world applications such as bio-medical computing, architectural design, digital archival, and scientific computing from acquired point cloud data

We welcome contributions from geometric modeling, CAD/CAE/CAM, product development, as well as from other domains.

Deadlines are as follow:

Submission of full papers:	15 April 2008
First decision notification:	15 June 2008
Submission revised papers:	30 July 2008
Final decision notification:	01 September 2008
Estimated publication date:	30 January 2009

Submission instructions:

All prospective authors are invited to obtain early feedback on possible submissions by e-mailing an abstract to the Guest Editors. All papers will be rigorously refereed peer reviewers of the Journal. Submission of a manuscript to this special issue of JCAD implies that no similar paper is already accepted or will be submitted to any other conference or journal. Authors should consult the "Instructions for Authors", which are available online and printed at the back of most issues of Computer-Aided Design, for information about preparation of their manuscripts. Papers of an appropriate standard not included in the special issue may be considered for publication in a regular issue of Computer-Aided Design. Manuscripts should be submitted through the Elsevier publication management system for the CAD Journal: <http://ees.elsevier.com/cad/>. Please prepare your paper following the Guide for Authors available from the Author Gateway, <http://authors.elsevier.com/journal/cad>. Please submit your paper via <http://ees.elsevier.com/cad>, choosing **Point-based Computational Techniques** as the Article Type (reference: **PBCT**).

Dr. Xiaoping Qian
qian@iit.edu

Dr. Imre Horváth
i.horvath@tudelft.nl