



Volume 31

Issue 3

June 2007

ISSN 0097-8493

# COMPUTERS & GRAPHICS

An international journal of systems  
& applications in computer graphics

Algorithms and techniques for interaction,  
multimedia, modelling and visualization

**EDITOR-IN-CHIEF: J. L. Encarnaçã**



*In this issue the special topic is*

**VISUAL ANALYTICS**

*Guest Editors: Jörn Kohlhammer, Daniel Keim, Dave Ebert*

AVAILABLE AT  
[www.ComputerScienceWeb.com](http://www.ComputerScienceWeb.com)

POWERED BY SCIENCE @ DIRECT®

*In this issue the special topic is*  
**CALLIGRAPHIC INTERFACES**  
*Guest Editors: Thomas Stahovich, Mario Costa Sousa*

		<i>EDITORIAL</i>
Joaquim Jorge	537	Editorial
		<i>SPECIAL SECTION: CALLIGRAPHIC INTERFACES</i>
Thomas F. Stahovich	538	Introduction
Joseph J. LaViola Jr.	540	An initial evaluation of MathPad <sup>2</sup> : A tool for creating dynamic mathematical illustrations
WeeSan Lee, Levent Burak Kara and Thomas F. Stahovich	554	An efficient graph-based recognizer for hand-drawn symbols
Matthew Kaplan and Elaine Cohen	568	Reconstructing the frontal geometry of drawings of arbitrary surfaces
Levent Burak Kara, Kenji Shimada and Sarah D. Marmalefsky	580	An evaluation of user experience with a sketch-based 3D modeling system
Suyu Hou and Karthik Ramani	598	Classifier combination for sketch-based 3D part retrieval
		<i>TECHNICAL SECTION</i>
Cameron Browne	610	Efficient Pythagorean trees: Greed is good
Ning Chen and Clifford A. Reiter	617	Best analogs for replacing missing image data
R.G. Laycock, G.D.G. Ryder and A.M. Day	625	Automatic generation, texturing and population of a reflective real-time urban environment
Jing Li, Wencheng Wang and Enhua Wu	636	Point-in-polygon tests by convex decomposition

(continued)

---

Indexed in GMT Abstr, Cam Sci Abstr, Comput Cont, Curr Cont,<sup>®</sup> Research Alert<sup>®</sup>, Curr Cont/CompuMath, Curr Cont/Eng Tech & Applied Sci, Curr Cont SCISEARCH<sup>®</sup> Data, Eng Ind, Ergon Abstr, Info Sci, Abstr, INSPEC Data, PIRA, SSSA/CISA/ECA/ISMEC

ISSN 0097-8493

---

TYPESET BY MACMILLAN INDIA LTD., BANGALORE-25  
PRINTED IN GREAT BRITAIN BY POLESTAR WHEATONS LTD, EXETER

371



ELSEVIER



0097-8493(200708)31:4;1-C