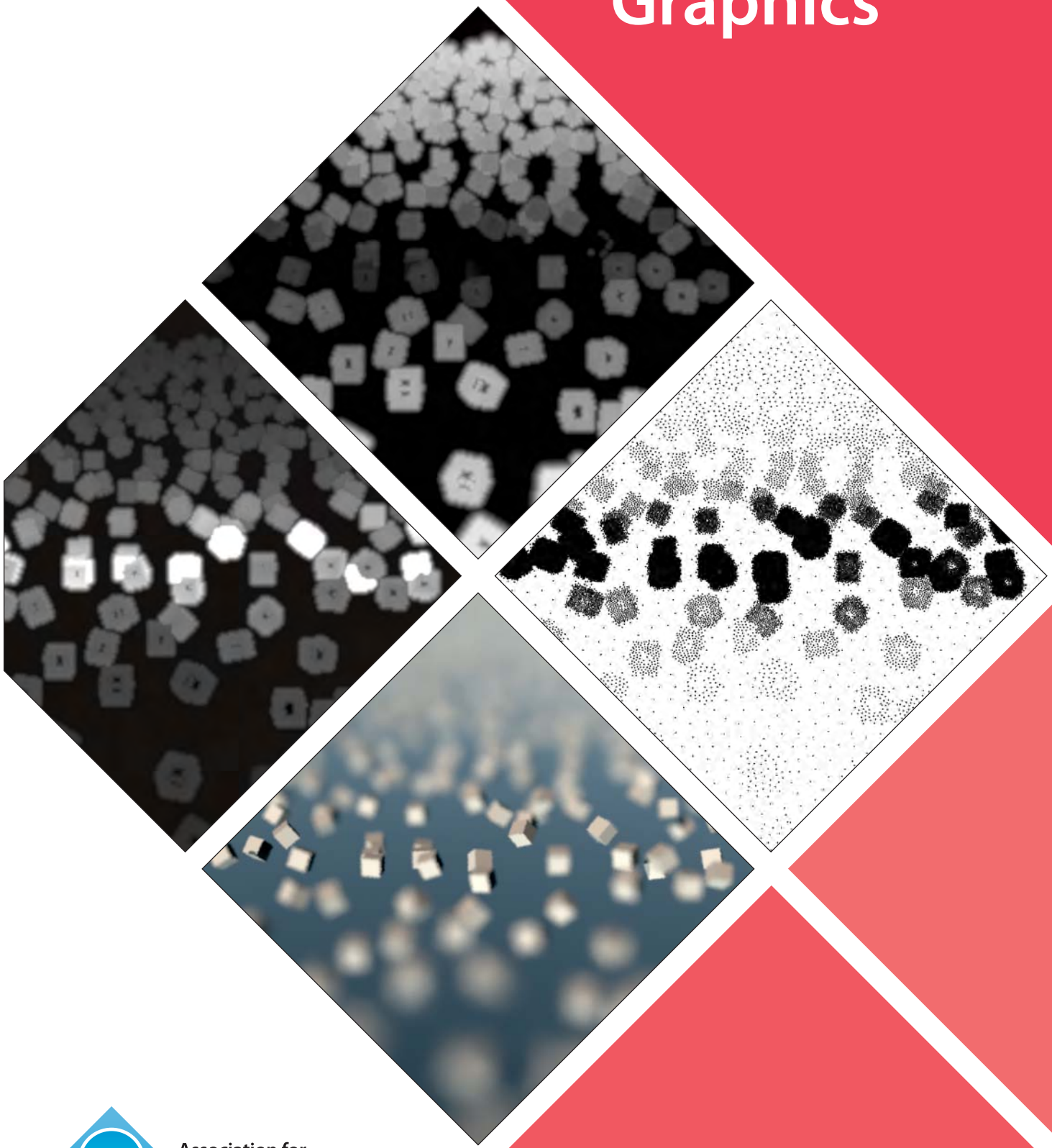
2009
Volume 28, Number 2

ACM Transactions on

Graphics



Association for
Computing Machinery

Advancing Computing as a Science & Profession

ACM Transactions on Graphics

2009 • Vol. 28 • No. 2

Articles 12-20

Article 12 (8 pages)	**A. J. Weber** **G. Gornowicz**	Collision-Free Construction of Animated Feathers Using Implicit Constraint Surfaces
Article 13 (19 pages)	**Q. Li** **J. Tian**	2D Piecewise Algebraic Splines for Implicit Modeling
Article 14 (17 pages)	**B. Sun** **R. Ramamoorthi**	Affine Double- and Triple-Product Wavelet Integrals for Rendering
Article 15 (15 pages)	**M. Wand** **B. Adams** **M. Ovsjanikov** **A. Berner** **M. Bokeloh** **P. Jenke** **L. Guibas** **H.-P. Seidel** **A. Schilling**	Efficient Reconstruction of Nonrigid Shape and Motion from Real-Time 3D Scanner Data
Article 16 (14 pages)	**M. Kobilarov** **K. Crane** **M. Desbrun**	Lie Group Integrators for Animation and Control of Vehicles
Article 17 (24 pages)	**A. J. P. Gomes** **J. F. M. Morgado** **E. S. Pereira**	A BSP-Based Algorithm for Dimensionally Nonhomogeneous Planar Implicit Curves with Topological Guarantees
Article 18 (12 pages)	**C. Soler** **K. Subr** **F. Durand** **N. Holzschuch** **F. Sillion**	Fourier Depth of Field
Article 19 (10 pages)	**J. Hasselgren** **J. Munkberg** **T. Akenine-Möller**	Automatic Pre-Tessellation Culling
Article 20 (10 pages)	**M. Alexa** **A. Adamson**	Interpolatory Point Set Surfaces—Convexity and Hermite Data

ACM Transactions on
Graphics

ACM
2 Penn Plaza, Suite 701
New York, NY 10121-0701
Tel.: (212) 869-7440
Fax: (212) 869-0481

TOG Home Page: http://www.acm.org/pubs/tog

Editor-in-Chief

Hugues Hoppe	Microsoft Research

Past Editor-in-Chief

John C. Hart	University of Illinois at Urbana-Champaign / http://graphics.cs.uiuc.edu/~jch/papers/

Associate Editors

Nina Amenta	University of California at Davis / email: amenta@cs.ucdavis.edu / http://www.cs.ucdavis.edu/~amenta/pubs/pubs.html
Daniel Cohen-Or	Tel Aviv University / email: dcor@tau.ac.il / http://www.cs.tau.ac.il/~dcor/
Doug DeCarlo	Rutgers University / email: decarlo@cs.rutgers.edu / http://www.cs.rutgers.edu/~decarlo/publications.html
Mathieu Desbrun	California Institute of Technology / email: mathieu@caltech.edu / http://www.geometry.caltech.edu/pubs.html
Julie Dorsey	Yale University / email: dorsey@cs.yale.edu / http://graphics.cs.yale.edu/julie/index.html
Michael Gleicher	University of Wisconsin / email: gleicher@cs.wisc.edu / http://pages.cs.wisc.edu/~gleicher/cgi-bin/list.py?ScriptStuff/papers.html
Cindy Grimm	Washington University / email: cmg@wustl.edu / http://www.cse.wustl.edu/~cmg/
Radek Grzeszczuk	Intel Corporation / email: radek.grzeszczuk@nokia.com / http://research.nokia.com/people/radek_grzeszczuk/
Aaron Hertzmann	University of Toronto / email: hertzman@dgp.toronto.edu / http://www.dgp.toronto.edu/~hertzman/
Christoph Hoffmann	Purdue University / email: cmh@cs.purdue.edu / http://www.cs.purdue.edu/homes/cmh/distribution/index.html
Takeo Igarashi	University of Tokyo / email: takeo@acm.org / http://www-ui.is.s.u-tokyo.ac.jp/~takeo/
Doug James	Cornell University / email: djames@cs.cornell.edu / http://www.cs.cornell.edu/~djames/
Henrik Wann Jensen	University of California San Diego / email: henrik@cs.ucsd.edu / http://graphics.ucsd.edu/~henrik/
Dani Lischinski	Hebrew University of Jerusalem / email: danix@cs.huji.ac.il / http://www.cs.huji.ac.il/%7Edanix/
Dinesh Manocha	UNC Chapel Hill / email: dm@cs.unc.edu / http://www.cs.unc.edu/~dm/
Nelson Max	University of California at Davis / email: max@cs.ucdavis.edu / http://www.cs.ucdavis.edu/people/faculty/max.html
Jorg Peters	University of Florida / email: jorg@cise.ufl.edu / http://www.cise.ufl.edu/research/SurfLab/pubs.shtml
Hanspeter Pfister	Harvard University / email: pfister@seas.harvard.edu / http://gvi.seas.harvard.edu/pfister
Zoran Popovic	University of Washington / email: zoran@cs.washington.edu / http://www.cs.washington.edu/homes/zoran/
Ravi Ramamoorthi	UC Berkeley / email: ravir@cs.columbia.edu / http://www.cs.columbia.edu/~ravir/
Thomas Sederberg	Brigham Young University / email: tom@cs.byu.edu / http://tom.cs.byu.edu/~tom/pub_sig.html
Francois Sillion	INRIA / email: francois.sillion@imag.fr / http://artis.inrialpes.fr/Publications/index.php?idAuthor=26&pg=-1
Jos Stam	Autodesk Inc. / email: jos.stam@autodesk.com / http://www.dgp.toronto.edu/~stam/reality/Research/pub.html
Joe Warren	Rice University / email: jwarren@cs.rice.edu / http://www.cs.rice.edu/~jwarren/research/index.html
Denis Zorin	New York University / email: dzorin@mrl.nyu.edu / http://www.mrl.nyu.edu/~dzorin/

Headquarters Staff

Jono Hardjowirogo	Publisher, Associate Director of Publications
Irma Strolia	Editorial Assistant
Media Content Marketing	Production

ACM Transactions on Graphics (ISSN: 0730-0301) is published quarterly in Spring, Summer, Fall, and Winter by the Association for Computing Machinery (ACM), 2 Penn Plaza, Suite 701, New York, NY 10121-0701. Periodicals class postage paid at New York, NY 10011, and at additional mailing offices. Printed in the U.S.A. POSTMASTER: Send address changes to *ACM Transactions on Graphics*, ACM, 2 Penn Plaza, Suite701, New York, NY 10121-0701.

For manuscript submissions, subscription, and change of address information, see inside backcover.

Copyright © 2009 by the Association for Computing Machinery (ACM). Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists, requires prior specific permission and/or a fee. Request permission to republish from: Publications Department, ACM, Inc. Fax +1 212-869-0481 or email permissions@acm.org.

For other copying of articles that carry a code at the bottom of the first or last page or screen display, copying is permitted provided that the per-copy fee indicated in the code is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

Association for Computing Machinery

Advancing Computing as a Science & Profession

Cover images from "Fourier Depth of Field," by C. Soler, K. Subr, F. Durand, N. Holzchuch, and F. Sillion, in this issue.

ACM Transactions on Graphics

http://www.acm.org/pubs/tog

ACM Transactions on Graphics publishes papers of significant and lasting value in all the subfields of computer graphics.

Guide to Manuscript Submission

Submission to the *ACM Transactions on Graphics* is done electronically through http://acm.manuscriptcentral.com. Once you are at that site, you can create an account and password with which you can enter the ACM Manuscript Central manuscript review tracking system. From a drop-down list of journals, choose *ACM Transactions on Graphics* and proceed to the Author Center to submit your manuscript and your accompanying files.

You will be asked to create an abstract that will be used throughout the system as a synopsis of your paper. You will also be asked to classify your submission using the ACM Computing Classification System through a link provided at the Author Center. For completeness, please select at least one primary-level classification followed by two secondary-level classifications. To make the process easier, you may cut and paste from the list. Remember, you, the author, know best which area and sub-areas are covered by your paper; in addition to clarifying the area where your paper belongs, classification often helps in quickly identifying suitable reviewers for your paper. So it is important that you provide as thorough a classification of your paper as possible.

The ACM Production Department prefers that your manuscript be prepared in either LaTeX or Ms Word format. Style files for manuscript preparation can be obtained at the following location: http://www.acm.org/pubs/submissions/submission.htm. For editorial review, the manuscript should be submitted as a PDF or Postscript file. Accompanying material can be in any number of text or image formats, as well as software/documentation bundles in zip or tar-gzipped formats.

Questions regarding editorial review process should be directed to the Editor-in-Chief. Questions regarding the post-acceptance production process should be addressed to the Publisher, Jono Hardjowirogo, at jono@hq.acm.org.

Subscription, Single Copy, and Membership Information.

Send orders to:

ACM
P.O. Box 12114
Church Street Station
New York, NY 10257

For information, contact:

Mail: ACM Member Services Dept.
2 Penn Plaza, Suite 701
New York, NY 10121-0701
Phone: +1-212-626-0500
Fax: +1-212-944-1318
Email: acmhelp@acm.org
Catalog: http://www.acm.org/catalog

Subscription rates for *ACM Transactions on Graphics* are $44 per year for ACM members, $39 for students, and $165 for nonmembers. Single copies are $18 each for ACM members and $40 for nonmembers. Your subscription expiration date is coded in four digits at the top of your mailing label; the first two digits show the year, the last two show the month of expiration.

About ACM. ACM is the world's largest educational and scientific computing society, uniting educators, researchers and professionals to inspire dialogue, share resources and address the field's challenges. ACM strengthens the computing profession's collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the professional growth of its members by providing opportunities for life-long learning, career development, and professional networking.

Visit ACM's Web site: http://www.acm.org.

Change of Address Notification. To notify ACM of a change of address, use the addresses above or send an email to coa@acm.org.

Please allow 6–8 weeks for new membership or change of name and address to become effective. Send your old label with your new address notification. To avoid interruption of service, notify your local post office before change of residence. For a fee, the post office will forward 2nd- and 3rd-class periodicals.