

Curriculum Vitae for
Mark A. Duchaineau

PRESENT POSITION:

Google, Inc.
1600 Amphitheatre Parkway,
Mountain View, CA 94043

PERSONAL:

Citizenship: U.S.

PROFESSIONAL MEMBERSHIPS:

Association for Computing Machinery
Institute for Electrical and Electronics Engineers
Society for Industrial and Applied Mathematics

EDUCATION:

9/1987-6/1996, University of California, Davis, CA, M.S. and Ph.D. (Computer Science)
9/1979-6/1981, 4/1985-6/1987, California State University, Hayward, CA, B.S. (Mathematics
and Computer Science)

EXPERIENCE:

Software Engineer, Geo Commerce, Google Inc., 3/2012-present
Computer Scientist, Center for Applied Scientific Computing, LLNL, 11/1996–3/2012
Graduate Research Assistant and Technical Staff Member, Los Alamos National Laboratory,
9/1995–11/1996
Research Assistant and Instructor, University of California, Davis, 9/1987–9/1995
Research and Development Manager, Anzac Computer Equipment Corp, Fremont, CA,
3/1986–9/1987
Self-Employed Software Consultant (DBA “Bitworks”), 6/78–5/1996

HONORS:

LLNL Global Security Gold Award, Sept. 2011, member of the Persistics Project
LLNL Chemistry and Materials Science Publication Award, 2006, with E. Bringa et al. Best
Paper Award, IEEE Visualization Conference, 2004, co-recipient
Program Committee, IEEE Visualization Conference, 2003, 2004, 2005, 2009
Outstanding Innovation Award, Los Alamos National Laboratory, 2001, co-recipient
Gordon Bell Prize for Best Performance, 1999 co-recipient
Outstanding Senior Award both in Mathematics and in Computer Science, California State
University, Hayward, 1977
Dean’s List Honors, 1986 and 1987, California State University, Hayward

RESEARCH/DESIGN EXPERTISE:

Geometric modeling/computer-aided geometric design, image synthesis, scientific
visualization, high-performance physics simulations and data analysis, wavelets/multi-
resolution methods, spatial data compression, aerial video processing, electronic design,
embedded/real-time processing, electro-optical systems, printer emulation, software copy
protection/digital rights management, high-performance i/o drivers, video game design and
artwork, audio synthesizer design, procedural natural phenomena, procedural audio,

graphical user interface systems, software development tools, agricultural automation, greenhouse design, plant breeding

FUNDING AND PROJECT LEADERSHIP:

Chief Scientist, Persistics Program (\$20M FY11-12, \$16M FY10-11, \$3.5M FY09); PI, VidCharts scalable video processing project (LDRD FY07 \$500K, LDRD FY08 \$595K, LDRD FY09 \$~500K, DOE NA-22 FY08 \$400K); Technical Lead, large-scale aerial video processing on GPUs (IC/DoD agency, FY06-07, \$400k); Research Team Leader, Advanced Strategic Computing Pre- and Post-Processing Environment, 2003-present (~2 full-time equivalent positions managed); PI, SAVAnTS large-scale scientific visualization project (LDRD FY99-01, ~\$500k/year).

TOP 10 CITED RESEARCH PAPERS (via Google Scholar Mar. 2012):

897: ROAMing terrain: Real-time Optimally Adapting Meshes [lead author]

104: Simulating materials failure by using up to one billion atoms and the world's fastest computer: Brittle fracture

103: Very High Resolution Simulation of Compressible Turbulence on the IBM-SP System

96: Simulating materials failure by using up to one billion atoms and the world's fastest computer: Work hardening

76: Bicubic subdivision-surface wavelets for large-scale isosurface representation and visualization

74: Interactive view-dependent rendering of large isosurfaces

58: Shock deformation of face-centered cubic metals on subnanosecond timescales

41: Atomic plasticity: description and analysis of a one-billion atom simulation of ductile materials failure

40: Real-time optimal adaptation for planetary geometry and texture: 4-8 tile hierarchies

39: Adaptive 4-8 texture hierarchies

GRADUATE STUDENTS SUPERVISED:

Shawn Recker, PhD Candidate, U.C. Davis; Quinn Hunter, Masters 2011, U.C. Davis; Nick Leaf, PhD Candidate, U.C. Davis; Hyojin Kim, PhD Candidate, U.C. Davis; Jan Prokaj, PhD Candidate, USC; Daniel Knoblauch, PhD 2011, U.C. San Diego; Robert Hero, PhD Candidate, U.C. Davis; Mauricio Hess-Flores, PhD 2011, U.C. Davis; Michael J. Goldman, Masters 2008, U.C. Davis; Stephen Cluff, Masters 2009, BYU; John C. Anderson, PhD 2009, U.C. Davis; Jason Kimball, PhD Candidate, U.C. Irvine; Christopher Co, PhD 2006, U.C. Davis; Joshua Senecal, PhD 2005, U.C. Davis; Serban Porumbescu, PhD 2005, U.C. Davis; Ilja Friedel, PhD 2005, Cal Tech; Lok Hwa, Masters 2004, U.C. Davis; Benjamin Gregorski, PhD 2004, U.C. Davis; Daniel Laney, PhD 2002, U.C. Davis; Falko Kuester, PhD 2001, U.C. Davis; Kathleen Bonnell, Masters 2001, U.C. Davis; Eric LaMar, PhD 2000, U.C. Davis; Martin Bertram, PhD 2000, U.C. Davis; Alex Pomeranz, Masters 2000, U.C. Davis.

OPEN SOURCE SOFTWARE:

Mark Duchaineau, copyrighted software and associated web site, <http://www.cognigraph.com>, 1991-2012, tarball 2012-03-25 md5sum=54a178763c131265c6bb51ad53779ea8.

A large collection of freely-redistributable software is provided as the LibGen source code. The distribution includes: a C preprocessing and build system (called Lib), a variety of low-level system wrapper libraries, a windowing system wrapper, mesh modeling code, terrain and texture hierarchy support (the ROAM Algorithm), image processing/computer vision (hierarchical image correspondence, mosaicing, video stabilization, super-resolution),

atomistic simulation support (compressed I/O, visualization and analysis code), regular-grid large-scale simulation support code, scripting languages (Loon and EI), and more.

INTELLECTUAL PROPERTY:

Charles Aldrich (Santa Fe, NM), Mark Duchaineau (Livermore, CA), Mark C. Miller (Davis, CA), Mark B. Mineev-Weinstein (Los Alamos, NM), David E. Sigeti (Los Alamos, NM), Murray Wolinsky (Santa Fe, NM), Patent 6208997, "Rapid production of optimal-quality reduced-resolution representations of very large databases", March 27, 2001.

Murray Wolinsky, James F. Reus, Mark Duchaineau, incorporated as CogniGraph Inc. in New Mexico, Proprietary methods for unifying software development, documentation generation and user interfaces, run-time heterogeneous parallel computing and type systems, 1996.

Mark Duchaineau, Proprietary software and hardware methods for copy protection and rapid disk i/o, 1978-1995.

Mark Duchaineau, Trademark "Spiradisc" for copy protection and rapid i/o system, 1981.

Mark Duchaineau, Proprietary software for video game content creation, compression, disk database layout and access, animation, sound and music generation, user interaction, rapid display, 1978-1995.

Mark Duchaineau, Copyrighted video games "Questworld" and "Target: Jihad", 1982.

Drew Harrington and Mark Duchaineau, Copyrighted video game "Gopher Broke", 1982.

PUBLICATIONS AND OTHER PAPERS:

Shawn Recker, Mauricio Hess-Flores, Mark Duchaineau, Kwan-Liu Ma, Kenneth I Joy, "Visualization of Uncertainty in Multi-View Scene Reconstruction", in submission.

Mauricio Hess-Flores, Mark Duchaineau, Kenneth I. Joy, "Parallax Path Constraints for Robust Multi-View 3D Reconstruction", in submission.

Hyojin Kim, Quinn Hunter, Mark Duchaineau, Kenneth Joy, and Nelson Max, "GPU-Friendly Multi-View Stereo for Outdoor Planar Scene Reconstruction", VISAPP 2012, part of VISIGRAPP: International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications, February 24-26, 2012, Rome, Italy, to appear.

Hyojin Kim, Mark Duchaineau, and Nelson Max, "GPU-based Scalable Volumetric Reconstruction for Multi-view Stereo", IVCNZ 2011, Twenty-sixth International Conference Image and Vision Computing New Zealand, November 29 - December 1, 2011, Auckland, New Zealand, 6 pages.

Daniel Knoblauch, Mauricio Hess-Flores, Mark A. Duchaineau, Kenneth I. Joy, Falko Kuester: Non-Parametric Sequential Frame Decimation for Scene Reconstruction in Low-Memory Streaming Environments. ISVC (1) 2011: 359-370.

Mauricio Hess-Flores, Daniel Knoblauch, Mark A. Duchaineau, Kenneth I. Joy, Falko Kuester, "Ray Divergence-Based Bundle Adjustment Conditioning for Multi-View Stereo", The Fifth Pacific-Rim Symposium on Image and Video Technology (PSIVT2011), Gwangju Institute of Science and Technology, South Korea, 20-23 November 2011, pp 153-164. LLNL-CONF-491364

E. M. Bringa, J. D. Monk, A. Caro, A. Misra, L. Zepeda-Ruiz, M. Duchaineau, F. Abraham, M.

Nastasi, S. T. Picraux, Y. Q. Wang, and D. Farkas, "Are Nanoporous Materials Radiation Resistant?", Nano Letters, 8/6/2011, Pages: 4.96.

E. M. Bringa, J. D. Monk, A. Caro, A. Misra, L. Zepeda-Ruiz, M. Duchaineau, F. Abraham, M. Nastasi, S. T. Picraux, Y. Q. Wang, and D. Farkas, "Are Nanoporous Materials Radiation Resistant?", Nano Letters, 8/6/2011, Pages: 4.96.

Jan Prokaj, Mark Duchaineau, Gerard Medioni, "Inferring Tracklets for Multi-Object Tracking", Proceedings of the 1st Workshop of Aerial Video Processing (WAVP) Joint with IEEE CVPR 2011, pp. 37-44, LLNL-PROC-482163.

Mark A. Duchaineau, J. B. Elliott, A. V. Hamza, T. Dittrich, T. Diaz de la Rubia, Farid F. Abraham, "Compaction dynamics of metallic nano-foams: A molecular dynamics simulation study", arXiv:1102.3718v1 (Feb 2011). LLNL-JRNL-468938.

J. B. Elliott, M. A. Duchaineau, T. Dittrich, A. V. Hamza, R. Macri, M. Marinak, "Compaction dynamics of metallic nano-foams: A hydrodynamics simulation study", arXiv:1102.3719v1, , Feb 17, 2011, 10 pages.

Mauricio Hess-Flores, Mark A. Duchaineau, Michael Goldman, Kenneth I. Joy, "Iterative Dense Correspondence Correction Through Bundle Adjustment Feedback-Based Error Detection", in "VISAPP 2010", pp 400--405, 2010. LLNL-CONF-420758.

John C. Anderson, Christoph Garth, Mark A. Duchaineau, Kenneth I. Joy, "Smooth, Volume-Accurate Material Interface Reconstruction," IEEE Transactions on Visualization and Computer Graphics, pp. 802-814, September/October, 2010.

Christopher S. Co, Mark A. Duchaineau, Kenneth I. Joy, "Streaming Aerial Video Textures", Scientific Visualization: Advanced Concepts, Dagstuhl Follow-Ups, Volume 1, 2010, pp 336-345.

John C. Anderson, Christoph Garth, Mark A. Duchaineau, Kenneth I. Joy, "Smooth, Volume-Accurate Material Interface Reconstruction", IEEE Transactions on Visualization and Computer Graphics, pp. 802-814.

John C. Anderson, Luke J. Gosink, Mark A. Duchaineau, Kenneth I. Joy, "Interactive Visualization of Function Fields by Range-Space Segmentation", Computer Graphics Forum 28(3), pp. 727-734, 2009.

Daniel Knoblach, Mauricio Hess-Flores, Mark Duchaineau, and Falko Kuester, "Factorization of correspondence and camera error for unconstrained dense correspondence applications", 5th International Symposium on Visual Computing (ISVC09), Nov 30th - Dec 2nd, 2009, Las Vegas, Nevada, USA, pp. 720-729. LLNL-PROC-417469

Stephen Cluff, Mark Duchaineau, Jonathan D. Cohen and Bryan Morse, "GPU-Accelerated Hierarchical Dense Correspondence for Real-Time Aerial Video Processing", IEEE Workshop on Motion and Video Computing (WMVC), Snowbird, Utah, Dec 7-10, 2009, pp. 87-94.

John C. Anderson, Christoph Garth, Mark A. Duchaineau, Kenneth I. Joy, "Discrete Multi-

Material Interface Reconstruction for Volume Fraction Data", in "Computer Graphics Forum (Proc. Of Eurographics/IEEE-VGTC Symposium on Visualization 2008)", Volume 27, Number 3, 2008, pp. 1015-1022. LLNL-CONF-400287

Mark Duchaineau, Alex V. Hamza, Tomas Diaz De La Rubia, Farid F. Abraham, "Atomistic Simulation of Compression Wave Propagation in Nanoporous Materials", arXiv:0807.1332 (July 2008)

Benjamin Gregorski, Joshua Senecal, Mark Duchaineau and Kenneth I. Joy, "Compression and Occlusion for Fast Isosurface Extraction from Massive Datasets", Mathematical Foundations of Scientific Visualization, Computer Graphics, and Massive Data Exploration, Mathematics and Visualization book series, Springer Berlin Heidelberg, 2009, pp. 303-323. UCRL-CONF-201180

E. Wes Bethel, Chris Johnson, Kenneth Joy, Sean Ahern, Valerio Pascucci, Hank Childs, Jonathan Cohen, Mark A. Duchaineau, Bernd Hamann, Charles D. Hansen, Daniel E. Laney, Peter Lindstrom, Jeremy S Meredith, George Ostrouchov, Steven Parker, Claudio T. Silva, Allen Sanderson, Xavier Tricoche, "SciDAC Visualization and Analytics Center for Enabling Technology", in "SciDAC 2007", Volume 78, Journal of Physics Conference Series-Series, pp 012032, 2007

P.-T. Bremer, E.M. Bringa, M.A. Duchaineau, A.G. Gyulassy, D. Laney, A. Mascarenhas and V. Pascucci. "Topological Feature Extraction and Tracking", In Journal of Physics, Conference Series, volume 78, Proceedings of SciDAC 2007, June 2007. UCRL-CONF-232179

Attila G. Gyulassy, Mark A. Duchaineau, Vijay Natarajan, Valerio Pascucci, Eduardo M. Bringa, A. Higginbotham, Bernd Hamann, "Topologically Clean Distance Fields", IEEE TVCG (Visualization 2007), 13(6), pp. 1432-1439, 2007. UCRL-JRNL-229890

John C. Anderson, Luke J. Gosink, Mark A. Duchaineau, Kenneth I. Joy, "Feature Identification and Extraction in Function Fields", Eurographics/IEEE VGTC Symposium on Visualization, pp. 195-201, May 23-25, 2007. UCRL-CONF-229577

Leonid V. Tsap, Mark Duchaineau, Dmitry B. Goldgof, "Data-Driven Feature Modeling, Recognition and Analysis in a Discovery of Supersonic Cracks in Multimillion-Atom Simulations", Pattern Recognition, Vol. 40 No. 9, pp. 2400-2407, 2007. UCRL-JC-143820

J.S. Wark, J.F. Belak, G.W. Collins, J.D. Colvin, H.M. Davies, M. Duchaineau, J.H. Eggert, T.C. Germann, J. Hawreliak, A. Higginbotham, B.L. Holian, K. Kadau, D.H. Kalantar, P.S. Lomdahl, H.E. Lorenzana, M.A. Meyers, B.A. Remington, K. Rosolankova, R.E. Rudd, M.S. Schneider, J. Sheppard, J.S. Stolken, "Shock Compression Of Condensed Matter", 2005: Proceedings of the Conference of the American Physical Society Topical Group on Shock Compression of Condensed Matter, AIP Conference Proceedings, Volume 845, pp. 286-291, 2006, UCRL-CONF-215010.

Eduardo M. Bringa, K. Rosolankova, R. E. Rudd, B. A. Remington, J. S. Wark, Mark A. Duchaineau, D. H. Kalantar, J. Hawreliak, J. Belak, "Shock Deformation of Face-Centered-Cubic Metals on Sub-Nanosecond Time Scales", Nature Materials, Volume 5, Issue 10, pp.

805-809 and cover image, 2006, UCRL-JRNL-210478.

Andrew Forsberg, Prabhat, James W. Head III, Graff Haley, Andrew Bragdon, Mark Duchaineau, Joseph Levy, Sarah Milkovich, Caleb Fassett and David Shean, "ADVISER: Immersive Field Work for Planetary Geoscientists", Computer Graphics and Applications, Volume 26, Issue 4, pp 46-54, March 23, 2006, UCRL-JRNL-218633.

Hank Childs, Mark Duchaineau, Kwan-Liu Ma, "A Scalable, Hybrid Scheme for Volume Rendering Massive Data Sets", Eurographics Symposium on Parallel Graphics and Visualization, pp 153-162, 2006, UCRL-CONF-218622.

Lok M. Hwa, Mark A. Duchaineau, Kenneth I. Joy, "Real-Time Optimal Adaptation for Planetary Geometry and Texture: 4-8 Tile Hierarchies", IEEE Transactions on Visualization and Computer Graphics, July/August 2005, pp 355-368, UCRL-JRNL-211433.

Markus J. Buehler, Alexander Hartmaier, Huajian Gao, Mark A. Duchaineau, and Farid F. Abraham, "The dynamical complexity of work-hardening: a large-scale molecular dynamics simulation", Acta Mechanica Sinica, Volume 21, Number 2, Pages: 103-111, 2005, UCRL-JRNL-204002.

M.J. Buehler, A. Hartmaier, H. Gao, M. Duchaineau and F.F. Abraham, "Atomic Plasticity: Description and Analysis of a One-Billion Atom Simulation of Ductile Materials Failure", Computer Methods in Applied Mechanics and Engineering, Vol. 193(48-51), Dec 3, 2004, pp. 5257-5282, UCRL-JRNL-218498.

Benjamin Gregorski, Joshua Senecal, Mark Duchaineau, and Kenneth I. Joy, "Adaptive Extraction of Time-Varying Isosurfaces", IEEE Transactions on Visualization and Computer Graphics, Vol 10, No. 6, Nov-Dec 2004, pp. 683-694, UCRL-JP-200087.

Joshua G. Senecal, Peter Lindstrom, Mark A. Duchaineau, Kenneth I. Joy, "An Improved N-Bit to N-Bit Reversible Integer Haar-Like Transform", Proceedings of the 12th Pacific Conference on Computer Graphics and Applications (PG'04), October 6-8, 2004, pp 371-380, UCRL-CONF-204061.

Lok M. Hwa, Mark A. Duchaineau, Kenneth I. Joy, "Adaptive 4-8 Texture Hierarchies", Proceedings IEEE Visualization 2004, October 2004, pp. 219-226, UCRL-CONF-205705.

Joshua G. Senecal, Mark A. Duchaineau, Kenneth I. Joy, "Reversible N-Bit to N-Bit Integer Haar-Like Transforms", Proceedings of the 7th IASTED International Conference on Computer Graphics and Imaging (CGIM '04), August 16-18, 2004, Kauai, Hawaii, edited by M. H. Hamza, pp 135-140, UCRL-CONF-202451-REV-1.

Martin Bertram, Mark A. Duchaineau, Bernd Hamann, Kenneth I. Joy, "Generalized B-spline subdivision-surface wavelets for geometry compression", IEEE Transactions on Visualization and Computer Graphics, Volume 10, Issue 3, May 2004, pp 326-338, UCRL-JP-200042.

Lars Linsen, Jevan T. Gray, Valerio Pascucci, Mark A. Duchaineau, Bernd Hamann, Kenneth I. Joy, "Hierarchical Large-scale Volume Representation with Third-Root-of-Two Subdivision and Trivariate B-spline Wavelets", Chapter in: Geometric Modeling for Scientific Visualization, Brunnett, G., Hamann, B., Mueller, H. and Linsen, L., eds., Mathematics + Visualization-Series, Springer-Verlag, 2004, UCRL-JC-151004.

Lars Linsen, Valerio Pascucci, Mark A. Duchaineau, Bernd Hamann, Kenneth I. Joy, "Wavelet-based Multiresolution with nth-root-of-2 Subdivision", Computing, 72(1-2), pp 129-142, April 2004, UCRL-JRNL-208695.

Joshua Senecal, Mark A. Duchaineau, Kenneth I. Joy, "Length-Limited Variable-to-Variable Length Codes for High-Performance Entropy Coding", Proceedings of the 2004 Data Compression Conference (DCC 2004), 23-25 March 2004, Snowbird, UT, USA, pp 389-398, UCRL-CONF-201688.

Mark A. Duchaineau, Kenneth I. Joy, "Progressive Precision Surface Design", in: Geometric Modelling for Scientific Visualization, Springer-Verlag, Brunnett, G., Hamann, B., Mueller, H. and Linsen, L., eds., pp 85-105, 2004, Springer-Verlag, Heidelberg, Germany, UCRL-JC-146823.

Benjamin F. Gregorski, David E. Sigeti, John J. Ambrosiano, Gerald Graham, Murray Wolinsky, Mark A. Duchaineau, Bernd Hamann, Kenneth I. Joy, "Multiresolution representation of datasets with material interfaces", in: Farin, G., Hamann, B. and Hagen, H., eds., Hierarchical and Geometrical Methods in Scientific Visualization, Springer-Verlag, Heidelberg, Germany, 2003, pp. 99-117, UCRL-JC-145747.

Mark A. Duchaineau, Serban D. Porumbescu, Martin Bertram, Bernd Hamann, Kenneth I. Joy, "Dataflow and Remapping of Wavelet Compression and View-dependent Optimization of Billion-triangle Isosurfaces", Chapter in: Hierarchical and Geometrical Methods in Scientific Visualization, Farin, G., Hamann, B. and Hagen, H., eds., Springer-Verlag, Heidelberg, Germany, pp 1-17, 2003, UCRL-JC-140718.

Kathleen S. Bonnell, Mark A. Duchaineau, Daniel A. Schikore, Bernd Hamann, Kenneth I. Joy, "Material Interface Reconstruction", IEEE Transactions on Visualization and Computer Graphics, Volume 9, Issue 4, pp 500-511, October 2003, UCRL-JC-147950.

Benjamin Gregorski, Mark Duchaineau, Peter Lindstrom, Valerio Pascucci, Kenneth I. Joy, "Interactive View-Dependent Rendering of Large Iso-Surfaces", Proceedings of IEEE Visualization 2002, Boston, MA, October 2002, pages 475-482, UCRL-JC-146819.

Daniel Laney, Martin Bertram, Mark Duchaineau, Nelson Max, "Multiresolution Distance Volumes for Progressive Surface Compression", Proceedings of the First International Symposium on 3D Data Processing Visualization, and Transmission (3DPVT 2002), Padova Italy, June 19-21, 2002, pp. 470-479, UCRL-JC-146852.

Lars Linsen, Valerio Pascucci, Mark A. Duchaineau, Bernd Hamann, Kenneth I. Joy, "Hierarchical representation of time-varying volume data with fourth-root-of-two subdivision and quadrilinear B-spline wavelets", in: Coquillart, S., Shum, H.-Y. and Hu, S.-M., eds.,

Proceedings of Tenth Pacific Conference on Computer Graphics and Applications - Pacific Graphics 2002, IEEE Computer Society Press, Los Alamitos, California, pp. 346-355, UCRL-JC-151063.

Farid F. Abraham, Robert Walkup, Huajian Gao, Mark Duchaineau, Tomas Diaz De La Rubia, Mark Seager, "Simulating materials failure by using up to one billion atoms and the world's fastest computer: Brittle fracture", Proceedings of the National Academy of Sciences of the United States of America, Vol. 99, No. 9, April 30, 2002, pp. 5777-5782 (plus cover image), UCRL-WEB-144724.

Farid F. Abraham, Robert Walkup, Huajian Gao, Mark Duchaineau, Tomas Diaz De La Rubia, Mark Seager, "Simulating materials failure by using up to one billion atoms and the world's fastest computer: Work-hardening", Proceedings of the National Academy of Sciences of the United States of America, Vol. 99, No. 9, April 30, 2002, pp. 5783-5787, UCRL-WEB-144724.

Martin Bertram, Mark A. Duchaineau, Bernd Hamann, Kenneth I. Joy, "Generalizing Lifted Tensor-product Wavelets to Irregular Polygonal Domains", Data Visualization: The State of the Art -- Proceedings Dagstuhl Seminar on Scientific Visualization, Kluwer Academic Publishers, Dordrecht, The Netherlands, 2002, 14 pages, UCRL-JC-147950.

Martin Bertram, Daniel E. Laney, Mark A. Duchaineau, Charles D. Hansen, Bernd Hamann, Kenneth I. Joy, "Wavelet Representation of Contour Sets", proceedings of IEEE Visualization 2001, Oct 24-26, 2001, pp. 303-310, UCRL-JC-144651.

Daniel Laney, Mark Duchaineau, Nelson Max, "A Selective Refinement Approach for Computing the Distance Functions of Curves", presented at Eurographics - IEEE TCVG symposium on visualization, Ascona, Switzerland, in: Data Visualization 2001, D. Ebert, J.M. Favre, R. Peikert, eds., May 28-30 2001, pp. 213-222, UCRL-JC-142632.

Mark A. Duchaineau, Martin Bertram, Serban Porumbescu, Bernd Hamann, Kenneth I. Joy, "Interactive Display of Surfaces Using Subdivision Surfaces and Wavelets", in: Kunii, T.L., ed., Proceedings of 16th Spring Conference on Computer Graphics, Comenius University, Bratislava, Slovak Republic, April 25-28, 2001, pp. 22-34, UCRL-JC-145745.

Martin Bertram, Mark A. Duchaineau, Bernd Hamann, Kenneth I. Joy, "Bicubic Subdivision-Surface Wavelets for Large-Scale Isosurface Representation and Visualization", Proceedings of IEEE Visualization 2000, T. Ertl, B. Hamann and A. Varshney, eds., Salt Lake City, Utah, October 9-13, 2000, pp 389-396, UCRL-JC-136993.

Kathleen Bonnell, Mark A. Duchaineau, Daniel Schikore, Bernd Hamann and Kenneth I. Joy, "Constructing Material Interfaces from Data Sets Containing Volume Fraction Information", Proceedings of IEEE Visualization 2000, T. Ertl, B. Hamann and A. Varshney, eds., Salt Lake City, Utah, October 9-13, 2000, pp. 367-372, UCRL-JC-138292.

Martin Bertram, Mark A. Duchaineau, Bernd Hamann and Kenneth I. Joy, "Wavelets on Planar Tessellations", Proceedings of The 2000 International Conference on Imaging Science, Systems, and Technology (CISST 2000), presented in Las Vegas, Nevada, H.R. Arabnia, F.-X. Coudoux, Y. Mun, G.P. Power, M. Sarfraz, Q. Zhu, eds., Computer Science Research, Education, and Applications Press (CSREA), Athens, Georgia, June 26-29, 2000,

pp. 619-625, UCRL-JC-137755.

Eric LaMar, Mark Duchaineau, Bernd Hamann and Kenneth I. Joy, "Multiresolution Techniques for Interactive Texture-Based Rendering of Arbitrarily Oriented Cutting Planes", in: van Liere, R., Hermann, I., and Ribarsky, W., eds., Proceedings of VisSim '00 -- The Joint Eurographics and IEEE TVCG Conference on Visualization, Amsterdam, The Netherlands, May 2000, pp. 105-114, UCRL-JC-145746.

Falko Kuester, Mark A. Duchaineau, Bernd Hamann, Kenneth I. Joy, Kwan-Liu Ma, "The Designer Workbench: Towards Real-Time Immersive Clay Modeling", presented at IS&T/SPIE Electronic Imaging 2000, San Jose, California, in: Merritt, J.O., Benton, S.A., Woods, A.J. and Bolas, M.T., eds, Stereoscopic Displays and Virtual Reality Systems VII, Proc. SPIE, Vol. 3957, SPIE - The International Society for Optical Engineering, Bellingham, Washington, January 23-28, 2000, pp. 464-472, UCRL-JC-146062.

Dmitriy Pinskiy, Joerg Meyer, Bernd Hamann, Kenneth I. Joy, Eric Brugger, Mark A. Duchaineau, "A Hierarchical Error-Controlled Octree Data Structure for Large-Scale Visualization", Crossroads -- The ACM Student Magazine, January 2000, pp. 26-31, UCRL-JC-145744.

A.A. Mirin, R.H. Cohen, B.C. Curtis, W.P. Dannevik, A.M. Dimits, M.A. Duchaineau, D.E. Eliason, D.R. Schikore, S.E. Anderson, D.H. Porter, P.R. Woodward, L.J. Shieh, S.W. White, "Very High Resolution Simulation of Compressible Turbulence on the IBM-SP System", Proceedings of Supercomputing 99 Conference, Portland, OR, Winner of the 1999 Gordon Bell Award for Performance, November 1999 (electronic publication), UCRL-JC-134237.

Falko Kuester, Mark A. Duchaineau, Bernd Hamann, Kenneth I. Joy, and Antonio E. Uva, "3DIVS: 3-dimensional immersive virtual sculpting", Presented at the Eighth ACM Conference on Information and Knowledge Management (CIKM '99), Kansas City, Missouri, in D.S. Ebert and C.D. Shaw, eds., Workshop in New Paradigms in Information Visualization and Manipulation (NPIV '99), ACM Press, New York, New York, November 99, pp. 92-95, UCRL-JC-145743.

Kenneth I. Joy and Mark A. Duchaineau, "Boundary Determination for Trivariate Solids", Proceedings of the 1999 Pacific Graphics Conference, Seoul, Korea, October 5-7, 1999, pp. 82-91, UCRL-JC-134275.

Duchaineau, M.A., M. Wolinsky, D.E. Sigeti, M.C. Miller, C. Aldrich, and M.B. Mineev-Weinstein, "ROAMing Terrain: Real-time Optimally Adapting Meshes," Proc. IEEE Visualization 97, October 1997, pp 81-88, UCRL-JC-127870.

Mark A. Duchaineau, "Dyadic Splines", PhD Dissertation, Advisor: Kenneth I. Joy, University of California, Davis, May 1996.

Mark A. Duchaineau, "Using General Polar Values as Control Points for Polynomial Curves", Computer Aided Geometric Design, November 1994, pp 411-423.

Mark A. Duchaineau, "Interval-Query Construction of Geometry, Illumination and Images", UC Davis Computer Science Technical Report, 1989.

Mark A. Duchaineau, "Construction of Crease-Free Fractals Using Dyadic Splines",
Proceedings of COMPUGRAPHICS92, December, 1992, pp 222-229.