

# Vita

Charles D. Hansen

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## Professional Employment

7/1 2005 to present	University of Utah	Full Professor (School of Computing)
8/15 2004 to 7/30 2005	INRIA Rhone-Alpes	Visiting Scientist
9/1 1998 to 6/30 2005	University of Utah	Associate Professor (School of Computing)
9/1/2003 to present	University of Utah	Associate Director Scientific Computing and Imaging Institute
7/1 2001 to 6/03 2003	University of Utah	Associate Director School of Computing
2/1 1997 to 8/31 1998	University of Utah	Research Associate Professor (Dept. of Computer Science)
9/18 1989 to 1/31 1997	Los Alamos National Lab	Technical Staff Member Advanced Computing Laboratory
9/1 1994 to 1/31 1997	Univ. of New Mexico	Visiting Research Assistant Professor
9/1 1990 to 1/31 1997	New Mexico Tech	Adjunct Professor
8/1 1988 to 7/31 1989:	University of Utah	Visiting Assistant Professor
7/5 1987 to 7/31 1988:	INRIA	Postdoctoral Research Scientist (Vision and Robotics)
1/1 1987 to 7/5 1987:	University of Utah	Research Assistant (Vision Group)
9/15 1986 to 12/31 1986:	University of Utah	Teaching Assistant (Computer Science Dept)
9/1 1986 to 9/14 1986:	University of Utah	Research Assistant (Vision Group)
9/1 1983 to 8/31 1986:	ARO Research Fellow	
6/16 1983 to 8/31 1983:	University of Utah	Research Assistant (Very Large Text Retrieval Project)
9/15 1982 to 6/15 1983:	University of Utah	Teaching Assistant (Computer Science Dept)
8/1 1979 to 8/31 1982	Fred P. Gattas Co. Memphis, Tn.	Systems Programmer
6/1 1977 to 7/31 1979	D and S Systems, Memphis, Tn.	Systems Analyst

## Education

AS	Computer Science Technology	State Technical Institute at Memphis	1977
BS	Applied Computer Science	Memphis State University	1981
PhD	Computer Science	University of Utah	June 1987

Dissertation title "CAGD-based Computer Vision"

## Areas of Interests

Large Scale Scientific Visualization, Rendering Techniques and Computer Graphics, Parallel Algorithms, Distributed Computation, 3D Shape representation, Computer Vision

## Research Grants and Contracts

### Current Grants

**NSF, \$848k, Co-PI,**

“Enabling Transformational Science and Engineering Through Integrated Collaborative Visualization and Data Analysis for the National User Community”,

**August 2009 - July 2012,**

Dr. Valerio Pascucci, PI.

**Exxon/Mobil, \$270k, Co-PI,**

“Earth Sciences Center,

**October 2006 - September 2011,**

co-PI with Drs. Chris Johnson, Valerio Pascucci, Claudio Silva, and Dr. Ross Whitaker, PI.

**Sandia, \$250k, Co-PI,**

“Visualization Research for Multicore Processors,

**June 2009 - June 2010,**

co-PI with Dr. Claudio Silva, PI.

**KAUST (subcontract from TAMU), \$1.67M, Co-PI,**

“Institute for Applied Mathematics and Computational Science”,

**June 2008 - June 2013,**

co-PI with Dr. Chris Johnson, PI.

**NSF, \$430k, Co-PI,**

“CRI: A Hierarchical Data Storage System for Large Data Simulation, Comparison”,

**March 2006-February 2010,**

co-PI with Dr. Steve Parker, PI, and Dr. Chris Johnson, Co-PI.

**NSF, \$250k, PI,**

“Advanced Volume Visualization”,

**February 2006-January 2010,**

PI with Dr. Sarah Creem-Regehr Co-PI.

**NSF, \$178k, PI,**

“An Advanced Interactive Multifield, Multisource Atmospheric Visual Analysis Environment”,

**July 2005-June 2009.**

**DOE ASCI/ASAP, \$20M total - responsible portion: \$714k, Senior Investigator,**

“Center for Simulation of Fires and Explosions”,

**Oct 2002-Sept 2009,**

Senior Investigator for Scientific Visualization.

## Past Grants

**DOE/LANL**, \$200k, **Co-PI**,

“Advanced Visualization Research,  
**August 2007 - September 2008**,  
co-PI with Claudio Silva, PI.

**DOE-LLNL**, \$675k, **PI**,

“Advanced Visualization Technology Center”,  
**October 2003-September 2006**,  
PI with Dr. Claudio Silva Co-PI.

**NSF**, \$191k, **PI**,

“Advanced Weather Data Visualization”,  
**October 2002-September 2006**.

**NIH**, \$245k, **co-PI**,

“CRCNS: Assembling Visible Neurons for Simulation”,  
**September 2002-August 2006**,  
co-PI with Dr. Ross Whitaker, PI.

**DOE-LANL**, \$13.5k, **PI**,

“GPU Based Data Analysis and Exploration”,  
**May 2004-Sept 2004**.

**NVIDIA**, \$300k, **PI**,

“Equipment gift for undergraduate education”,  
**January 2004**.

**NIH**, \$3.7M, **co-PI**,

“Center for the Modeling, Simulation, and Visualization of Bioelectric Fields”,  
**Sept 1999- Oct 2004**  
Co-PI with Dr. Chris Johnson, PI and Dr. Rob MacLeod, Co-PI.

**DOE**, \$660k, **co-PI**,

“Sci-DAC Fusion, A National Collaboratory to Advance the Science of High Temperature Plasma  
Physics for Magnetic Fusion”,  
**Oct 2001-Sept 2004**  
co-PI with Dr. Chris Johnson, PI.

**DOE-LLNL**, \$275k, **PI**,

“Advanced Visualization Technology Center renewal”,  
August 2002-Sept 2003,  
PI with Dr. Chris Johnson and Dr. Steve Parker, Co-PI.

**DOE-LLNL**, \$500k, **co-PI**,

“Advanced Visualization Technology Center renewal”,

August 2001-July 2002,  
Co-PI with Dr. Chris Johnson, PI and Dr. Steve Parker, Co-PI.

**DOE-LLNL**, \$98k, **PI**,  
“Parallel Time-dependent Visualization”,  
October 2000-August 2001,  
PI with Dr. Steve Parker co-PI.

**UofU Research Instrumentation**, \$45k, **PI**,  
“Proposal for a Video-Switching System”,  
July 2000.

**DOE-ANL**, \$598k, **co-PI**,  
“Advanced Visualization Technology Center renewal”,  
March 2000-Feb 2001,  
Co-PI with Dr. Chris Johnson, PI.

**SNL**, \$30k, **PI**,  
“Undergraduate Experience in Research”,  
Nov 1999-Sept 2000.

**NSF**, \$485k, **co-PI**,  
“Interactive Flow Visualization using Haptics”,  
Jan 2000-Dec 2002,  
NSF-ARC, Co-PI with Dr. Chris Johnson PI and Dr. John Hollerbach co-PI.

**NSF**, \$527k, **PI**,  
“Interactive Ray Tracing for Visualization”,  
Sept 1999-Aug 2002,  
NSF-ARC, PI with Drs. Pete Shirley, Brian Smits, and Bill Thompson co-PIs.

**NSF**, \$872k, (NSF: \$610k, UofU match: \$262k), **PI**,  
“Acquisition of an Experimental Testbed for Computer Graphics”,  
Aug 1999-July 2002,  
NSF-MRI, PI with Drs. Bill Thompson, Chris Johnson, Pete Shirley, and Elaine Cohen, co-PIs.

**NIH**, \$3.2M, **co-PI**,  
“Center for the Modeling, Simulation, and Visualization of Bioelectric Fields”,  
Sept 1999-Sept 2003  
Co-PI with Dr. Chris Johnson, PI and Dr. Rob MacLeod, Co-PI.

**DOE**, \$1.5M, **co-PI**,  
“CorridorOne: An Integrated Distance Visualization Environment for SSI and ASCII”,  
July 1999-July 2002,  
co-PI with Dr. Chris Johnson, co-PI.

**UofU Seed Grant**, \$35k, **co-PI**,

“Medical Imaging Problems for Magnetic Encephalography”,  
Feb 1999-Feb 2000,  
co-PI with Dr. Jeff Lewine(Radiology), PI.

**LLNL**, \$60k, **PI**,  
“Rapid Extraction of Isosurfaces from Time-Varying Data”,  
Feb 1999-Feb 2000.

**SNL**, \$30k, **PI**,  
“Undergraduate Experience in Research”,  
Nov 1998-Sept 1999.

**DOE-ANL**, \$1.425M, **co-PI**,  
“Advanced Visualization Technology Center”,  
Feb 1998-Feb 2000,  
Co-PI with Dr. Chris Johnson, PI.

**DOE ASCI/ASAP**, \$20M total - responsible portion: \$914k, **Senior Investigator**,  
“Center for Simulation of Fires and Explosions”,  
Oct 1997-Sept 2002,  
Senior Investigator for Scientific Visualization.

**NSF**, \$410k, **co-PI**,  
“User-directed hybrid deterministic and Monte Carlo parallel light transport algorithms”,  
Oct 1997-Sept 2000,  
Co-PI with Dr. Peter Shirley, PI.

**DOE ASCI**, \$1.2M, **PI**,  
“PSE Visualization for Accelerated Strategic Computing Initiative”,  
Oct 1996 - Sept 1997,  
Principal Investigator, Tri-Laboratory coordinator.

**DOE ASCI**, \$600k, **PI**,  
“PSE Visualization for Accelerated Strategic Computing Initiative”,  
Oct 1995 - Sept 1996.

**DOE HPCC**, \$500K, **PI**,  
“Parallel and Distributed Visualization”,  
Oct 1995 - Sept 1996.

**DOE HPCC**, \$500K, **PI**,  
“Visualization Component of GRACCE”,  
Oct 1994 - Sept 1995.

**DOE HPCC**, \$750K, **PI**,  
“Visualization Component of GRACCE”,  
Oct 1993 - Sept 1994.

**DOE HPCC, \$640K, PI,**

“Visualization Component of GRACCE”,

Oct 1992 - Sept 1993.

**DOE HPCC, \$200K, co-PI,**

“High Performance Computation and Communication”,

Jan 1992 - Sept 1992,

Co-Investigator, Dr. Andy White, PI.

**DARPA, \$300K, co-PI, “iWARP: High-Speed Networking and Visualization”,**

Oct 1991 - Sept 1992,

Co-Principal Investigator.

**DOE AMS, \$100K, co-PI,**

“SIMD Rendering Techniques”,

Oct 1990 - Sept 1991,

Co-Investigator, Dr. Andy White, PI.

**LANL ISRD, \$214K, PI,**

“Distributed Visualization”,

Oct 1990 - Sept 1993.

## Reviewer

International Conference on Pattern Recognition  
IEEE Conference on Robotics and Automation  
IEEE Conference on Computer Vision and Pattern Recognition  
IEEE Conference on Visualization  
International Conference on Computer Vision  
ACM SIGGRAPH  
National Science Foundation  
DOE Energy Research Programs  
IEEE Pattern Analysis and Machine Intelligence  
IEEE Transactions on Visualization and Computer Graphics  
IEEE Computer Graphics and Applications  
ACM Transactions on Graphics  
Journal for Graphics Tools

## Editorial Duties:

Guest Editor: IEEE Transactions on Visualization and Computer Graphics, Vol. 13, No. 6, November/December 2007  
Guest Editor: IEEE Computer Graphics and Applications, Vol. 23, No. 2, March 2003  
Guest Editor: IEEE Computer Graphics and Applications, Vol. 14, No. 4, July 1994  
Guest Editor: IEEE Parallel and Distributed Technology, Vol. 2, No. 2, Summer 1994  
Editorial Board: International Journal of High Performance Computer Graphics, Multimedia and Visualization,  
February 1997 - 1999  
Editorial Board: IEEE Transactions on Visualization and Computer Graphics, January 2003 - January 2007  
Associate Editor-in-Chief: IEEE Transactions on Visualization and Computer Graphics, August 2003 - January 2007

## Fellowships and Honors

**IEEE Computer Society Technical Achievement Award** “For Seminal Work on Tools for Understanding Large-Scale Scientific Data Sets”, October 2005, The IEEE VGTC Visualization Technical Achievement Award was established in 2004. It is given every year to recognize an individual for a seminal technical achievement in visualization.

**Best Paper Award** “Non-Photorealistic Volume Rendering Using Stippling Techniques”, IEEE Visualization 2002, Oct. 2002

**Best Paper Nomination** “Interactive Translucent Volume Rendering and Procedural Modeling”, IEEE Visualization 2002, Oct. 2002

**Best Paper Award** “Interactive Volume Rendering Using Multi-Dimensional Transfer Functions and Direct Manipulation Widgets”, IEEE Visualization 2001, Oct. 2001

**Best Paper Award** “Interactive Ray Tracing for Isosurface Extraction”, IEEE Visualization '98, Oct. 1998

**Best Panel Award** “Tera-Scale Visualization: issues and approaches”, IEEE Visualization '97, October 1997

**Bourse Chateaubriand** Postdoctoral Research Fellowship, INRIA Rocquencourt France, July 1987 to July 1988

**NSF Travel Award** NATO Advanced Study Institute on Pattern Recognition Theory and Applications, Spa Belgium June 14 - June 22, 1986

**ARO Fellowship** Reliable Robotic Architectures, Army Research Office, September 1, 1983 to August 31, 1986

**Phi Kappa Phi** Member University of Utah

## **Selected Professional Activities**

### **Executive Committees:**

IEEE Technical Committee on Computer Graphics: Board Member, 1995-2002  
IEEE Transactions on Visualization and Computer Graphics: Editor-in-Chief Search Committee Chairman, 2002  
SIGGRAPH: Small Conference Coordinator, 1995 - 2000  
SIGGRAPH: Executive Committee: Director at Large, July 1995 - June 1998  
SIGGRAPH: Vice-Chair Rio Grande SIGGRAPH Local Chapter, July 1995- June 1996

### **Conference Organization:**

Papers Co-Chair: IEEE Visualization 2008, 2008  
Papers Co-Chair: IEEE Visualization 2007, 2007  
Short Papers Co-Chair: Eurographics 2006, Vienna Austria  
IEEE Visualization Conference Steering Committee: 2001-2004  
Conference Co-Chair: 2004 EUROGRAPHICS/IEEE-CS Symposium on Visualization  
Workshop Co-Chair: 2003 ACM/SIGGRAPH/Eurographics Campfire, "Visualization Meets Visual Effects"  
Conference Co-Chair: 2003 EUROGRAPHICS/IEEE-CS Symposium on Visualization  
Conference Co-Chair: IEEE Visualization 2001 Conference, 2001  
Conference Co-Chair: IEEE Visualization 2000 Conference, 2000  
Program Co-Chair: IEEE Visualization '99 Conference, 1999  
Program Co-Chair: IEEE Visualization '97 Conference, 1997  
Symposium Co-Chair: ACM-SIGGRAPH/IEEE Volume Rendering Symposium, 1996  
Symposium Co-Chair: ACM-SIGGRAPH/IEEE 1st Parallel Rendering Symposium, 1993  
Workshop Co-Chair: Scientific Visualization Environments, IEEE Visualization 1991

## Selected Professional Activities, continued

### Program Committees:

Program Committee: Pacific Vis, 2009  
Program Committee: ACM Super Computing , 2009  
Program Committee: TopoVis: Topological Methods for Visualization, 2009  
Program Committee: ACM I3D, 2009  
Program Committee: Pacific Vis, 2008  
Program Committee: IEEE/Eurographics Eurovis, 2008  
Program Committee: Eurographics Workshop on Parallel Graphics and Visualization, 2008  
Program Committee: IEEE/Eurographics Eurovis, 2007  
Program Committee: TopoVis: Topological Methods for Visualization, 2007  
Program Committee: Eurographics Workshop on Parallel Graphics and Visualization, 2007  
Program Committee: IEEE/Eurographics Eurovis, 2006  
Program Committee: Eurographics Workshop on Parallel Graphics and Visualization, 2006  
Program Committee: 4th International Workshop on Volume Graphics (VG '05)  
Program Committee: 10th Conference on Vision, Modeling, and Visualization (VMV'05)  
Program Committee: ACM SIGGRAPH Symposium on Interactive 3D Graphics & Games, 2005  
Program Committee: IEEE/Eurographics Eurovis, 2005  
Program Committee: 9th Conference on Vision, Modeling, and Visualization (VMV'04)  
Program Committee: EUROGRAPHICS Workshop on Parallel Graphics and Visualization, 2004  
Program Committee: IEEE Visualization 2004 Conference, 2004  
Program Committee: IEEE Visualization 2003 Conference, 2003  
Program Committee: IEEE Visualization 2002 Conference, 2002  
ACM SIGGRAPH Emerging Technologies Jury: 2002  
ACM SIGGRAPH Sketches Jury: 2002  
Program Committee: 2002 EUROGRAPHICS/IEEE-CS Symposium on Visualization  
Program Committee: 4th International Symposium on High Performance Computing 2002  
Program Committee: 2002 EUROGRAPHICS Workshop on Parallel Graphics and Visualization  
Program Committee: IEEE 2001 Symposium on Parallel and Large-Data Visualization and Graphics  
Program Committee: International Workshop on Volume Graphics 2001  
Program Committee: 2001 EUROGRAPHICS/IEEE-CS Symposium on Visualization  
Program Committee: 2000 EUROGRAPHICS Workshop on Parallel Graphics and Visualization  
SIGGRAPH Papers Committee: SIGGRAPH 2000  
SIGGRAPH Papers Committee: SIGGRAPH 1999  
Program Committee: EG - IEEE TCCG Symposium on Visualization, Vienna 1999  
Program Committee: 1999 EUROGRAPHICS/IEEE-CS Symposium on Visualization  
Papers Committee: IEEE Visualization '98 Conference, 1998  
Case Studies Committee: IEEE Visualization '98 Conference, 1998  
Program Committee: 1998 EUROGRAPHICS Workshop on Parallel Graphics and Visualization  
Program Committee: International Workshop on Volume Graphics, Swansea 1998  
Case Studies Committee: IEEE Visualization '98 Conference, 1998  
Program Committee: 1997 Parallel Rendering Symposium  
SIGGRAPH Sketches Jury: 1997  
SIGGRAPH Applications Jury: 1996  
Program Committee: First EUROGRAPHICS Workshop on Parallel Graphics and Visualization 1996  
Program Committee: 1995 Parallel Rendering Symposium  
SIGGRAPH Panel Jury: 1994  
SIGGRAPH Panel Jury: 1990

## **Selected Professional Activities, continued**

### **Review Panels:**

NSF: 2008  
UNC: CISMM External Advisory Board 2007  
Netherlands Organization for Scientific Research: 2007  
Netherlands Organization for Scientific Research: 2006  
University of Bergen: Search Committee for Chair in Visualization, 2006  
NIH: UCSF Site Visit 2006  
UNC: CISMM External Advisory Board 2006  
eScience: E-Viz External Advisory Committee 2006  
NSF: CISE Panel 2006  
NIH-NSF: NIH-NSF Workshop for the Future of Visualization 2005  
DHS: Department of Homeland Security Taskforce for National Visual Analytics 2005  
NIH-NSF: NIH-NSF Workshop for the Future of Visualization 2004  
DHS: Department of Homeland Security Taskforce for National Visual Analytics 2004  
LLNL: Computing Research Directorate LDRD Review 2004  
NSF: CISE Panel 2003  
NSF: CISE Panel2002  
NSF: STC site visit, 2001  
NSF: CISE Panel2001  
Ohio Supercomputing Center : External Review Board, 2001  
LLNL: Computing Directorate Research Review Board, 2001  
DOE: LLNL LDRD External Review Board, 2000  
NSF: CISE Panel1999  
DOE: ASCI Level 2 Panel, 1998  
NSF: CISE Panel1998  
IDA: ISAT Study Group on Visualization of Information Spaces, 1997  
NSF: Division of Mathematical Sciences, Institute Site Visit Panel, 1997  
NSF: STC Site Visit Panel, 1996

### **Miscellaneous:**

Member: ACM, ACM-SIGGRAPH  
Senior Member: IEEE

## Selected Professional Activities, continued University Committees

Department: Graduate Admissions Committee 2008  
Research Grants Review 2008  
Graduate Admissions Committee 2007  
Research Grants Review 2007  
Computer Facilities Committee Fall 2003  
Associate Director of the School of Computing 2002-2003  
Associate Director of the School of Computing 2001-2002  
Associate Director of the School of Computing 2000-2001  
Systems Comprehensive Committee 2001  
Computer Facilities Committee (chair) 2001  
Graduate Studies Committee 1999-2000 (Chair)  
Graduate Studies Committee 1998-1999 (Chair)  
Computer Policy Committee 1998-1999  
Facility Faculty Liaison 1997-1998  
Computer Policy Committee 1997-1998 (Chair)

College: Dean Search Committee 2003  
New Building Committee 2001-2002  
College Computing Resources 1997-1998

University: Associate Director of the Scientific Computing and Imaging Institute 2007-2008  
IT Council 2007-2008  
University Seed Grant Committee 2007-2008  
Associate Director of the Scientific Computing and Imaging Institute 2006-2007  
University Seed Grant Committee 2006-2007  
IT Council 2006-2007  
Associate Director of the Scientific Computing and Imaging Institute 2005-2006  
University Seed Grant Committee 2005-2006  
Associate Director of the Scientific Computing and Imaging Institute 2003-2004  
University Seed Grant Committee 2003-2004  
CHPC Faculty Advisory Board 2002-2003  
Graduate Research Fellowship Selection Committee 2002  
University Seed Grant Committee 2002-2003  
ITEC 2001-2002  
University Seed Grant Committee 2001-2002  
CHPC Faculty Advisory Board 2001-2002  
CHPC Faculty Advisory Board 2000-2001  
CHPC Faculty Advisory Board 1999-2000  
Network Technical Advisory Committee 1999-2000  
Network Technical Advisory Committee 1998-1999  
CHPC Faculty Advisory Board 1998-1999  
EGI Director Search Committee 1998-1999  
Network Technical Advisory Committee 1997-1998

## Keynote or Distinguished Lecturer

1. “Interactive Texture-based Flow Visualization”, Distinguished Lecture, Fraunhofer Institute for Graphics and Interaction”, Darmstadt, June 2009.
2. “Advanced Visualization in CSAFE”, Capstone Talk, CUIC, Bordeaux, June 2007.
3. “Interdisciplinary Research”, Keynote, Norway Workshop on Visualization, University of Bergen, May 2007.
4. “Large-Scale Scientific Visualization”, Distinguished Lecture Series, University of Nebraska, Lincoln, April 2007.
5. “Large-Scale Scientific Visualization”, Keynote, Theory and Practice of Computer Graphics 2006, Middlesbrough, UK.
6. “Advanced Visualization Techniques”, Distinguished Lecture Series, Technical University of Graz, Austria, June 2006.
7. “Future of Large-Scale Scientific Visualization”, Symposium on the Future of Visualization, UNCC, Keynote Address.
8. “Suppose the World was Piecewise Plastic”, Distinguished Lecture Series, Technical University of Vienna, The Institute of Computer Graphics and Algorithms, June 2005.
9. “Visualization Research: What’s Next?”, l’Association Aristote, l’Universite Paris-Sud-Orsay, March 2005.
10. “Techniques for Advanced Visualization”, Les Seminaires de l’INRIA Rhone-Alpes, INRIA, Grenoble, November 2004.
11. “Leveraging PC Graphics Cards for Advanced Visualization”, Keynote Lecture for Fachbereich Graphische Datenverarbeitung (FB-GDV), Gesellschaft fur Informatik, the Computer Graphics Section of the German Computer Science Association, Konstanz Germany, May 2004.
12. “High Performance Visualization: So much data, so little time...”, Keynote Address, Intl. Conference on Parallel Computing (ParCo2003), Dresden Germany, September 2003.
13. “Large-Scale Biomedical Visualization using BioPSE and Star-Ray”, SGI Technical Users’ Conference, Mountain View, CA, June 2003.
14. “Advanced Methods for Visualization”, Distinguished Lecture, Purdue University, February 2003.
15. “Large Scale Scientific Visualization”, Distinguished Lecture, University of Manchester, GB, February 2003.
16. “Interactive Biomedical Computing”, SGI Visualization Summit, Paris, February 2003.
17. “Advanced Rendering Methods for Visualization”, Keynote Address, Vision, Modeling and Visualization (VMV2002), Erlangen Germany, November, 2002.
18. “Parallel Methods for Scientific Visualization and Computer Graphics”, Keynote Address, SIAM Symposium on Parallel Processing, March 2001.
19. “Is There a Future for Parallel Graphics and Visualization?”, Keynote Address, Eurographics Workshop on Parallel Graphics and Visualization, September 2000.
20. “High Performance Visualization and the ASCI Program”, Keynote Address, Chevron Petroleum Research, Vis-Expo, May 4, 1998.

## Invited Talks

- “VACET: Visual Analytics Center for Enabling Technologies”, International Supercomputing Conference, Hamburg, June 2009.
- “Interactive Texture-based Flow Visualization”, University of Kaiserslauterne, June 2009.
- “Multi-Field Volume Visualization”, IAMCS Spring Symposium, May 2009
- “Large-scale Scientific Visualization”, IAMCS Colloquium, TAMU, May 2009
- “Multidimensional Transfer Functions and other GPU Methods”, Exxon-Mobile, August 2008.
- “Interactive Texture-based Flow Visualization”, LANL, August 2008.
- “Physically Correct Flow Visualization”, Curves and Surfaces 2008, Norway.
- “CSAFE: Large Scale Scientific Computation”, University of Kaiserslautern, May 2008.
- “On Visualization and Graphics”, IRISA, Rennes, May 2007.
- “Recent Visualization at Utah”, Center for Applied Scientific Computing, LLNL, April 2007.
- “Is Seeing Really Believing?”, Conference on Visualization in Medicine and Life Sciences, Ruegen, Germany, July 2006.
- “Visualization Research: What’s Next?”, SISMA Visualisation haute performance, CEA, Paris, March 2005.
- “The Future Visualization Platform”, Panel Participant, Visualization 2004.
- “On the Use of Commodity Clusters for Large-Scale Scientific Applications”, Invited presentation, ARL Commodity Cluster Symposium, July 2003.
- “Cluster-based Methods for Visualization”, Center for Applied Scientific Computing, LLNL, June 2003.
- “Leveraging PC Graphics Cards for Advanced Visualization”, Centre Engerie Atomic, Department Sciences de la Simulation et de l’Information, May 2003.
- “Leveraging PC Graphics Cards for Advanced Visualization”, Simon Fraiser University, May 2003.
- “Methods for Advanced Visualization”, University of Stuttgart, March 2003.
- “Leveraging PC Graphics Cards for Advanced Visualization”, University of Kaiserslautern, March 2003.
- “Leveraging PC Graphics Cards for Advanced Visualization”, Computer Science Colloquia Series, University of Alabama, February 2003.
- “Volume Rendering: Aren’t we done yet?”, Dagstuhl Workshop on Scientific Visualization, 2003
- “Advanced Volume Visualization”, Center for Applied Scientific Computing, LLNL, October 2002.
- “Leveraging PC Graphics Cards for Advanced Visualization”, Advanced Computing Laboratory Colloquia Series, LANL, August 2002.
- “Visualization Research at the University of Utah”, Department of Computer Science, Ohio State University, November 2000.
- “Large Scale Visualization”, Dagstuhl Workshop on Scientific Visualization, 2000

“Effective Methods for Large Scale Visualization, Dagstuhl Workshop on Scientific Visualization, May 2000

“Interactive TeraScale Visualization: An Oxymoron”, Invited Lecture, NSF/DOE Workshop on Large-scale Visualization and Data Management, May 1999

“Real-Time Ray Tracing”, Colloquium Speaker, University of New Mexico, Department of Computer Science, December 1998.

“View Dependent Visualization”, Colloquium Speaker, Center for Applied Scientific Computing, LLNL, October 1998.

“Tera-Scale Visualization”, Colloquium Speaker, University of New Mexico, Department of Computer Science, March 1998.

“Visualization for Tera-Scale Computing”, Colloquium Speaker, University of California, Davis , February 1998.

“Visualization for the ASCI Program”, Colloquium Speaker, Scientific Computing and Communications Department, LLNL, February, 1998.

“Tera-Scale Visualization: issues and approaches”, Panel Participant, Visualization '97

“Simulation Steering”, Dagstuhl Workshop on Scientific Visualization, 1997

“Advanced Methods for Volume Visualization” NRO Workshop, Phoenix, Az. February 1996

“Volume Visualization in Hardware and Software”, Panel Organizer, Volume Visualization Workshop 1996

“Parallel Rendering: Which is better, HW or SW?”, Panel Participant, Parallel Rendering Symposium 1995

“Data Parallel Rendering”, Dagstuhl Workshop on Scientific Visualization, 1994

“Parallel Rendering Practices”, Panel Participant Parallel Rendering Symposium 1993

“Scientific Visualization Environments” Co-chair. IEEE Visualization 1991, San Diego, Ca. October 1991

“HIPPI for High-Speed Distributed Visualization” SIGGRAPH/SIGCOMM Workshop on Highspeed Graphics, Boulder, Co. Jan 1991

“High Performance Distributed Visualization” SIGGRAPH Workshop on High-speed Graphics and Networking, Las Vegas, Nv. August 1991

“Data Structures for Scientific Visualization: The Los Alamos National Laboratory Position”, SIGGRAPH Workshop on Data Structures and Access Methods for Scientific Visualization, Dallas, Tx., August 1990

## Students Graduated

- Joshua Stratton, MS Advisor, Interactive Volume Rendering” School of Computing, University of Utah, Fall 2008.
- Aaron Knoll, PhD Advisor, Large Scale Visualization Dissertation: “Ray Tracing Implicit Surfaces For Interactive Visualization”, School of Computing, University of Utah, Fall 2008.
- Guo-Shi Li, PhD Advisor, Interactive Flow Visualization Dissertation: “Interactive Flow Visualization”, School of Computing, University of Utah, Spring 2008.
- Milan Ikits, PhD Advisor, Dissertation: “Interactive Exploration of Volumetric Data Sets with a Combined Visual and Haptic Interface”, School of Computing, University of Utah, Fall 2006.
- Joe Kniss, PhD Advisor, Dissertation: “Multi-field Volume Rendering”, School of Computing, University of Utah, Summer 2006.
- James Bigler, MS Advisor, Thesis: “Use of Silhouette Edges and Ambient Occlusion in Particle Visualization”, School of Computing, University of Utah, Summer 2004.
- Shaun Ramsey, PhD Advisor, Computer Graphics, Dissertation: “Rendering Transitions in a Geometric Level of Detail Framework”, School of Computing, University of Utah, Summer 2004.
- Chris Wyman, PhD Advisor, Dissertation: “Fast Local Approximation to Global Illumination”, School of Computing, University of Utah, Summer 2004.
- John McCorquodale, MS Advisor, Non-thesis option, Graduated May 2003.
- Charles Schmidt, MS Advisor, Thesis: “Simulating Refraction Using Geometric Transforms”, School of Computing, University of Utah, Graduated May 2003.
- Joe Kniss, MS Advisor, Thesis: “Interactive Volume Rendering Techniques”, School of Computing, University of Utah, Graduated August 2002.
- Eric Luke, MS Advisor, Thesis: “SEMOTUS VISUM: A Flexible Remote Visualization Framework”, School of Computing, University of Utah, Graduated May 2002.
- Ashutosh S. Mehndiratta, MS Advisor, Thesis: “Multiresolution Techniques for Volume Visualization”, School of Computing, University of Utah, Graduated May 2002.
- Phil Sutton, MS Advisor, Thesis: “Isosurface Extraction in Time-Varying Fields”, Dept of Computer Science, University of Utah, Graduated May 2000.
- Tushar Udeshi, MS Advisor, Thesis: “Towards Interactive Photorealistic Rendering, A Hybrid Approach”, Dept of Computer Science, University of Utah, Graduated December 1999.
- Mark Schelzenback, ME Advisor, Project: “Real-Time Ray Tracing”, Dept of Computer Science, University of Utah, December 1999.
- Michelle Miller ME Advisor, Project: “Distributed Simulation Steering”, Dept of Computer Science, University of Utah, Graduated Spring 1998.
- Pat McCormick MS Advisor, Thesis: “Deferred Shading Techniques”, Dept of Computer Science, University of New Mexico, Graduated 1996.
- Paul Hinker PhD Advisor, Dissertation: “Massively Parallel Geometry Extraction”, Dept of Computer Science, New Mexico Tech, Graduated 1993.

### **Students Advising**

Jianrong Shu, PhD Advisor, Multi-Field Visualization School of Computing, University of Utah, Expected 2009.

Mathias Schott, PhD Advisor, Volume Shading School of Computing, University of Utah, Expected 2010.

Mark Kim, PhD Advisor, GPU Flow Visualization School of Computing, University of Utah, Expected 2012.

Yong Wan, PhD Advisor, School of Computing, University of Utah, Expected 2012.

### **Students Committee Member**

- Simon Walton, PhD Committee (external Examiner), Department of Computer Science, University of Wales Swansea, Graduated December 2007.
- Younis Hijazi, PhD Committee (external Examiner), Department of Computer Science, University of Kaiserslautern, Graduated December 2007.
- Lee Meyers, MS Committee, School of Computing, University of Utah, Expected Completion 2008.
- Anastasia Mirinova, MS Committee, School of Computing, University of Utah, Expected Completion 2008.
- Wei Guo, PhD Committee, School of Computing, University of Utah, Expected Completion 2008.
- Keming Zhang, PhD Committee, School of Computing, University of Utah, Expected Completion 2008.
- Laurent Castanie, PhD Committee, Institut National Polytechnique de Lorraine, Ecole Nationale Supérieure de Géologie, Nancy, France, Graduated 2006.
- Christiaan Gribble, PhD Committee, School of Computing, University of Utah, Graduated 2006.
- Ivan Viola, PhD Committee, Technical University of Vienna, Graduated 2005.
- Kirk Riley, PhD Committee, Electrical and Computer Engineering, Purdue University, Graduated 2005.
- Aidon Lu, PhD Committee, Electrical and Computer Engineering, Purdue University, Graduated 2005.
- Robert L. Van Uitert, PhD Committee, School of Computing, University of Utah, Graduated 2005.
- Gordon Kindlmann, PhD Committee, School of Computing, University of Utah, Graduated 2004.
- David Weinstein, PhD Committee, School of Computing, University of Utah, Graduated 2003.
- Juergen Scholze-Doebold, PhD Committee, Department of Computer Science, Institute for Visualization and Interactive Systems, Technical University of Stuttgart, Graduated 2003.
- Helen Hu, PhD Committee, School of Computing, University of Utah, Graduated 2003.
- Vidya Elangovan, MS Committee, Dept of Computer Science, University of Utah, Graduated 2001.
- Yu Chen, MS Committee, Dept of Bioengineering, University of Utah, Graduated 2000.
- Yarden Livnat, PhD Committee, Optimized Isosurface Extraction, Dept of Computer Science, University of Utah, Graduated 1999.
- Steve Parker, PhD Committee, Steering of Scientific Computations, Dept of Computer Science, University of Utah, Graduated 1999.
- A.J. Preetham, MS Committee, Dept of Computer Science, University of Utah, Graduated 1999.
- Chen-Chi Kuo, PhD Committee, Dept of Computer Science, University of Utah, Graduated 1999.
- Pat Crossno PhD Committee, Particle Systems for Scientific Visualization, Dept of Computer Science, University of New Mexico, Graduated 1998.
- Todd Frost PhD Committee, Parallel Rendering and CAGD, Dept of Computer Science, Arizona State University, Graduated 1995.

### **Undergraduate Theses**

Joshua Andersen, BS Thesis Advisor, Thesis: “Implementing and Comparing Different Lighting Models and Procedural Fire Using Cg”, School of Computing, University of Utah, Graduated 2004.

Cameron Christensen, BS Thesis Advisor, Thesis: “Parallel Image Composition for Shared Memory Multiprocessors”, Dept of Computer Science, University of Utah, Graduated 2000.

### **Postdoctoral Supervision**

Xavier Tricoche February 2004 - June 2006.

Xavier Cavin October 2001 - October 2002, Current Position: Research Scientists, INRIA-Lorraine.

Erik Reinhard February 2000 - May 2002, Current Position: Assistant Professor, University of Central Florida.

## Courses

CS 5600 Introduction to Computer Graphics, Univ of Utah, Spring 2008  
CS 5610/6610 Interactive Computer Graphics, Univ of Utah, Fall 2007  
CS 5630/6630 Scientific Visualization”, Univ of Utah, Fall 2006  
CS 5610/6610 Computer Graphics II, Univ of Utah, Fall 2006  
CS 5630/6630 Scientific Visualization”, Univ of Utah, Fall 2005  
CS 5610/6610 Computer Graphics II, Univ of Utah, Fall 2005  
CS 5610/6610 Computer Graphics II, Univ of Utah, Fall 2003  
Independent Studies, Advanced Graphics HW Programming 6 students, Univ of Utah, Spring 2003  
CS 5610/6610 Computer Graphics II, Univ of Utah, Fall 2002  
CS 5320/6320 Computer Vision I, Univ of Utah, Spring 2002  
CS 5610/6610 Computer Graphics II, Univ of Utah, Fall 2001  
CS 6937 Seminar: Advanced Computer Graphics Architectures, Univ of Utah, Fall 2001  
CS 5610/6610 Computer Graphics II, Univ of Utah, Spring 2001  
CS 5600/6600 Computer Graphics I, Univ of Utah, Fall 2000  
CS 5961/6960 Computer Graphics II, Univ of Utah, Spring 2000  
CS 5610/6610 Computer Graphics II, Univ of Utah, Spring 2000  
CS 5600/6600 Computer Graphics I, Univ of Utah, Fall 1999  
CS 6937 Computer Graphics Seminar”, Univ of Utah, Spring 2000  
CS 5630/6630 Scientific Visualization”, Univ of Utah, Spring 1999  
CS 6938 Scientific Computing and Imaging Seminar”, Univ of Utah, Spring 1999  
CS 6937 Computer Graphics Seminar”, Univ of Utah, Spring 1999  
“Distributed Computing with MPI”, Univ of Utah, Winter 1998, (Undergraduate Independent Study)  
“Deferred Shading Rendering”, Univ of NM-Los Alamos, Fall 1996, (Graduate Independent Study)  
“Scientific Visualization”, Short Course at KTH, Stockholm, Sweden, Summer 1996  
“Advanced Scientific Visualization Techniques”, SIGGRAPH 1995, August 1995, (with Roger Crawfis LLNL)  
“Distributed Computing”, Univ of NM-Los Alamos, Spring 1995, (Undergraduate Independent Study)  
“Introduction to Scientific Visualization, Supercomputing 1994, November 1994, (with Mike Bailey SDSC)  
“Introduction to Scientific Visualization, Visualization 1994, October 1994, (with Mike Bailey SDSC)  
“Advanced Scientific Visualization Techniques”, SIGGRAPH 1994, August 1994, (with Roger Crawfis LLNL)  
“Introduction to Scientific Visualization Tools and Techniques”, SIGGRAPH 1993, July 1993, (with Mike Bailey SDSC)  
“Introduction to Graphics and Scientific Visualization”, Tutorial Supercomputing ’92, Nov. 1992 (with Prof Ed Angel UNM)  
“Introduction to Scientific Visualization Tools and Techniques”, SIGGRAPH 1992, July 1992  
“Volumetric Rendering”, Univ of NM-Los Alamos, Spring 1992, (Independent Study)  
“Introduction to Graphics and Scientific Visualization”, Tutorial Supercomputing ’91, Nov. 1991 (with Prof Ed Angel UNM)  
“High-Performance Computational Science”, Univ of NM, Summer 1991  
“Introduction to Robotics”, Univ of Utah, Spring 1989 (graduate level).  
“Advanced Computer Vision”, Univ of Utah, Winter 1989 (graduate level)  
“Introduction to Computer Vision”, Univ of Utah, Fall 1988 (graduate level)

**Professional Publications** Student co-authors are underlined.

### Published Papers: Books

1. “Visualization for Data-Intensive Science”, Charles Hansen, Chris R. Johnson, Valerio Pascucci, Claudio T. Silva, *The Fourth Paradigm: Data-Intensive Scientific Discovery*, Microsoft Research, Edited by Tony Hey, Stewart Tansley, and Kristin Tolle, ISBN: 978-0-9825442-0-4, pages 153-164, 2009.
2. “Visualization of Coherent Structures in Transient Flows”, Christoph Garth, Guo-Shi Li, Xavier Tricoche, Charles D. Hansen and Hans Hagen, *Topology-Based Methods in Visualization II*, Springer, Mathematics and Visualization Series, ISBN: 978-3-540-88605-1, pages 1-13, 2009.
3. “Illuminating the Path: Research and Development Agenda for Visual Analytics”, James Thomas and Kristin Cook Editors, co-authored by panel.
4. Charles Hansen and Chris Johnson, editors. Visualization Handbook, Elsevier Press, ISBN: 0-12-387582-x, 984 pages, 2004.
5. “Multi-Dimensional Transfer Functions for Volume Rendering”, Joe Kniss, Gordon Kindlemann, Charles Hansen, *The Visualization Handbook*, Elsevier Press, 2004.
6. “Volume Rendering Techniques”, Milan Ikits, Joe Kniss, Aaron Lefohn, Charles Hansen, *GPU Gems*, pp. 667-692, Addison Wesley, 2004.
7. “Known and Potential High Performance Computing Applications in Computer Graphics and Visualization,” Charles Hansen, *High Performance Computing for Computer Graphics and Visualization*, M. Chen, P. Townsend, J.A. Vince (Eds.), Proceedings of the International Workshop on High Performance Computing for Computer Graphics and Visualization, pp. 23-29, Springer-Verlag, 1995.
8. “High Speed Trinocular Stereo for Mobile Robot Navigation,” Charles Hansen, Nicholas Ayache, Francis Lustman, *Highly Redundant Sensor Systems in Robotics*, J. T. Tou (Ed.), NATO-ASI Series, Springer-Verlag, pp. 127-146, 1990.
9. “CAD-based Computer Vision,” Charles Hansen and Tom Henderson, *CAD-based programming for Sensor-based Robotics*, R. Ravani (Ed.), NATO-ASI Series, Springer-Verlag, pp. 275-298, 1989.
10. “Multisensor Knowledge Systems,” Tom Henderson and Charles Hansen, *Real-Time Object Measurement and Classification*, A. K. Jain (Ed.), NATO-ASI Series, Springer-Verlag, pp. 375-390, 1988.
11. “Intrinsic Characteristics as the Interface between CAD and Machine Vision Systems,” Tom Henderson, Charles Hansen, Bir Bhanu, *Pattern Recognition Theory and Applications*, (eds. P. Devijver and J. Kittler), NATO-ASI Series, Springer-Verlag, pp. 461-470, 1987.

### Published Papers: Journals

1. “A Bayesian Monte Carlo Approach to Global Illumination”, Jonathan Brouillat, Christian Bouville, Brad Loos, Charles Hansen, Kadi Bouatouch Computer Graphics Forum Journal, Early View, Date: October 2009.

2. "Occam's razor and petascale visual data analysis", E. W. Bethel, C. Johnson, S. Ahern, J. Bell, P.-T. Bremer, H. Childs, E. Cormier-Michel, M. Day, E. Deines, T. Fogal, C. Garth, C. G. R. Geddes, H. Hagen, B. Hamann, C. Hansen, J. Jacobsen, K. Joy, J. Kreuger J. Meredith, P. Messmer, G. Ostrouchov, V. Pascucci, K. Potter, Prabhat, D. Pugmire, O. Reubel, A. Sanderson, C. Silva, D. Ushizima, G. Weber, B. Whitlock, K. Wu, *Journal of Physics: Conference Series*, vol. 180, 2009.
3. "Volume Ray Casting with Peak Finding and Differential Sampling", Aaron Knoll, Younis Hijazi, Rolf Westerteiger, Mathias Schott, Charles Hansen, Hans Hagen, *IEEE Transactions on Visualization and Computer Graphics*, Volume 15, Number 6, 2009, pp. 1571-1578.
4. "An Interactive Visualization Tool for Multi-channel Confocal Microscopy Data in Neurobiology Research", Yong Wan, Hideo Otsuna, Chi-Bin Chien, and Charles Hansen, *IEEE Transactions on Visualization and Computer Graphics*, Volume 15, Number 6, 2009, pp. 1489-1496.
5. "A Directional Occlusion Shading Model for Interactive Direct Volume Rendering", Mathias Schott, Vincent Pegorara, Charles Hansen, Kevin Boulanger, Kadi Bouatouch, *Computer Graphics Forum Journal*, Volume 28, Number 3, 2009, pp. 855-862.
6. "Fast Ray Tracing of Arbitrary Implicit Surfaces with Interval and Affine Arithmetic", Aaron Knoll, Younis Hijazi, Andrew Kensler, Mathias Schott, Charles Hansen, and Hans Hagen, *Computer Graphics Forum Journal*, Volume 28, Number 1, 2009, pp. 26-40.
7. "Coherent Multiresolution Isosurface Ray Tracing", Aaron Knoll, Ingo Wald and Charles Hansen *The Visual Computer*, Volume 25, Number 3, 2009, pp. 209-225.
8. "Physically-based Dye Advection for Flow Visualization", Guo-Shi Li, Charles Hansen, Xavier Tricoche, *Computer Graphics Forum Journal*, Volume 27, Number 3, 2008, pp. 727-73.
9. "Flow Charts: Visualization of Vector Fields on Arbitrary Surfaces", Guo-Shi Li, Xavier Tricoche, Daniel Weiskopf, Charles Hansen, *IEEE Transactions on Visualization and Computer Graphics*, Volume 14, Number 5, 2008, pp. 1067-1080.
10. "Interactive Isosurface Ray Tracing of Time-Varying Tetrahedral Volumes", Ingo Wald, H. Friedrich, Aaron Knoll, Charles Hansen, In *IEEE Transactions on Visualization and Computer Graphics 2007* Volume 13, Number 6, 2007 pp. 1727-1734.
11. "SciDAC Visualization and Analytics Center for Enabling Technologies – Strategy for Petascale Visual Data Analysis Success," E.W. Bethel, C. Johnson, C. Aragon, Prabhat, O. Ruebel, G. Weber, V. Pascucci, H. Childs, P.-T. Bremer, B. Whitlock, S. Ahern, J. Meredith, G. Ostrouchov, K. Joy, B. Hamann, C. Garth, M. Cole, C. Hansen, S. Parker, A. Sanderson, C. Silva, X. Tricoche. *CTWatch Quarterly*, Volume 3, Number 4, November 2007.
12. "SciDAC Visualization and Analytics Center for Enabling Technology", E.W. Bethel, C.R. Johnson, K. Joy, S. Ahern, V. Pascucci, H. Childs, J. Cohen, M. Duchaineau, B. Hamann, C. Hansen, D. Laney, P. Lindstrom, J. Meredith, G. Ostrouchov, S.G. Parker, C.T. Silva, A. Sanderson, X. Tricoche, *Journal of Physics: Conference Series*, vol. 78, 2007.
13. "Ray-Driven Dynamic Working Set Rendering For Complex Volume Scene Graphs Involving Large Point Clouds", David Chisnall, Min Chen, Charles Hansen, *The Visual Computer*, Vol.23 (3), 2007, 167-179.
14. "VACET: Proposed SciDAC2 Visualization and Analytics Center for Enabling Technologies", W. Bethel, C. Johnson, C. Hansen, S. Parker, A. Sanderson, C. Silva, X. Tricoche, V. Pascucci, H. Childs, J. Cohen, M. Duchaineau, D. Laney, P. Lindstrom, S. Ahern, J. Meredith, G. Ostrouchov, K. Joy and B. Hamann, *Journal of Physics: Conference Series* Vol. 46, 2006, 561-569.

15. "Soft Shadow Maps: Efficient Sampling of Light Source Visibility", Lionel Atty, Nicolas Holzschuch, Marc Lapierre, Jean-Marc Hasenfratz, Charles Hansen, Francois X. Sillion, *Computer Graphics Forum* Vol. 25 (4), 2006, 725-741.
16. "Interactive Display of Isosurfaces with Global Illumination", Chris Wyman, Steve Parker, Peter Shirley, Charles Hansen *IEEE Transactions on Visualization and Computer Graphics*, Vol. 12 (2), 2006, pp 186-196.
17. "Reconstruction and Visualization of Planetary Nebulae", Marcus Magnor, Gordon Kindlmann, Charles Hansen, Neb Durie *IEEE Transactions on Visualization and Computer Graphics*, Vol. 11 (5), 2005, pp 485-496.
18. "Ray Bilinear Patch Intersections", Shaun Ramsey, Kristie Potter, Charles Hansen *Journal for Graphics Tools*, Vol. 9 (3) 2004, pp 41-47.
19. "A Streaming Narrow-Band Algorithm: Interactive Computation and Visualization of Level Sets", Aaron E. Lefohn, Joe M. Kniss, Charles D. Hansen, Ross T. Whitaker, *IEEE Transactions on Visualization and Computer Graphics*, Vol. 10 (4), July 2004, pp 422-433
20. "Illustrative Interactive Stipple Rendering", Aidong Lu, Christopher J. Morris, Joe Taylor, David S. Ebert, Charles Hansen, Penny Rheingans, and Mark Hartner *IEEE Transactions on Visualization and Computer Graphics*, Vol. 9 (2), April 2003, pp 127-138
21. "A Model for Volume Lighting and Modeling", Joe Kniss, Simon Premoze, Charles Hansen, Peter Shirley, and Allen McPherson *IEEE Transactions on Visualization and Computer Graphics*, Vol. 9 (2), April 2003, pp 150-162
22. "Multi-Dimensional Transfer Functions for Interactive Volume Rendering", Joe Kniss, Gordon Kindlmann, and Charles Hansen, *IEEE Transactions on Visualization and Computer Graphics*, Vol. 8 (3), July 2002, pp 270-285
23. "TRex, Texture-based Volume Rendering for Extremely Large Datasets", Joe Kniss, Patrick McCormick, Al McPherson, James Ahrens, Jamie Painter, Alan Keahey, and Charles Hansen, *IEEE Computer Graphics and Applications*, Vol. 21 (4), 2001, pp 52-61
24. "Accelerated Isosurface Extraction in Time-varying Fields", Philip Sutton and Charles Hansen, *IEEE Transactions on Visualization and Computer Graphics*, Vol. 6 (2), 2000, pp 98-107
25. "The Deferred Accumulation Buffer", Patrick McCormick, Charles Hansen, and Ed Angel, *Journal for Graphics Tools*, Vol. 4 (3), 1999, pp 35-46
26. "Interactive Computing and Visualization", Christopher Johnson, Steven Parker, Charles Hansen, Gordon Kindlmann, and Yarden Livnat, *IEEE Computer*, Vol. 32 (12), 1999, pp 59-65
27. "Interactive Ray Tracing for Volume Visualization", Steven Parker, Michael Parker, Yarden Livnat, Peter-Pike Sloan, Charles Hansen, and Peter Shirley, *IEEE Transactions on Visualization and Computer Graphics*, Vol. 5 (3), 1999, pp 238-250
28. "Parallel Sphere Rendering", Michael Krogh, James Painter, Charles Hansen, *Parallel Computing*, Vol. 23 (7), 1997, pp 961-974
29. "Parallel Volume Rendering Using Binary-Swap Compositing", Kwan-Liu Ma, James Painter, Charles Hansen, Michael Krogh, *IEEE Computer Graphics and Applications*, Vol. 14, No. 4, July 1994, pp 59-68
30. "The Impact of Gigabit Network Research on Scientific Visualization", Charles Hansen and Stephen Tenbrink, *The Visual Computer*, Vol. 9, No. 6, 1993, pp 318-323

31. "Parallel Path Consistency," Steve Susswein, Thomas C. Henderson, Joe Zachary, Chuck Hansen, Paul Hinker, Gary Marsden, *International Journal of Parallel Programming*, Vol. 20, No. 6., 1991 pp 453-473
32. "High-speed Networks, Visualization and Massive Parallelism in the Advanced Computing Laboratory", Dave Forslunk, Paul Hinker, Charles Hansen, W. St. John, S. Tenbrink, J. Brewton, *Computing Systems in Engineering*, Vol 3, Nos 1-4, 1992
33. "CAGD-Based Computer Vision", Charles Hansen and Tom Henderson, *IEEE Pattern Recognition and Machine Intelligence*, Vol. 11, No. 10, pp. 1181-1193, November 1989
34. "Multisensor Knowledge Systems: Interpreting 3-D structure," Thomas C. Henderson, Amar Mitiche, Eliot Weitz, Chuck Hansen, *International Journal of Robotics Research*, Special Issue on Multisensor Integration, Vol. 7, No. 6, pp. 114-137, December 1988
35. "Apparent Symmetries in Range Data," Rod Grupen, Charles Hansen, Tom Henderson, *Pattern Recognition Letters*, Vol. 7, pp. 107-111, February 1988
36. "The Specification of Distributed Sensing and Control," Tom Henderson, Charles Hansen, Bir Bhanu, *Journal of Robotic Systems*, Vol. 2. No. 4, pp. 387-396, 1986
37. "Organizing Spatial Data for Robotics Systems," Thomas C. Henderson, Chuck Hansen, Wu So Fai, *Computers in Industry*, Vol. 6, No.5, pp. 331-344, October 1985
38. "MKS: A Multi-sensor Kernel System," Tom Henderson, Wu So Fai, Charles Hansen, *IEEE Trans. on Systems, Man and Cybernetics*, Vol. SMC-14, No. 5, pp. 784-791, September/October 1984

### Published Papers: Conference Proceedings (refereed papers)

1. “Interactive Ray Tracing of Arbitrary Implicits with SIMD Interval Arithmetic,” Aaron Knoll, Younis Hijazi, Charles Hansen, Ingo Wald, Hans Hagen, 2nd IEEE/EG Symposium on Interactive Ray Tracing 2007, pages 11-17, Ulm, Germany, 2007.
2. “Visualization of Coherent Structures in Transient Flows”, Christoph Garth, Guo-Shi Li, Xavier Tricoche, Charles D. Hansen and Hans Hagen TopoInVis 2007, Grimma, Germany.
3. “Interactive Isosurface Ray Tracing of Large Octree Volumes”, Aaron Knoll, Ingo Wald, Steven Parker, and Charles Hansen IEEE Symposium on Interactive Ray Tracing 2006, pp. 115-124, Salt Lake City, UT.
4. “Knowledge-Based Out-of-Core Algorithms for Data Management in Visualization”, Min Chen, David Chisnall, Charles Hansen, Eurographics/IEEE-VGTC Symposium on Visualization 2006, pp. 107-114, Portugal.
5. “GPUFLIC: Interactive and Accurate Dense Visualization of Unsteady Flows”, Guo-Shi Li, Xavier Tricoche, Charles Hansen, Eurographics/IEEE-VGTC Symposium on Visualization 2006, pp. 29-34, Portugal.
6. “A Case Study: Visualizing Material Point Method Data”, James Bigler, James Guilkey, Christiaan Gribble, Charles Hansen, Steven Parker, Eurographics/IEEE-VGTC Symposium on Visualization 2006, pp. 299-306, Portugal.
7. “The Proxy Chain Algorithm and Its Application to Scientific Visualization”, Milan Ikits and Charles Hansen, 14th Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems 2006, pp. 525-532, Arlington, VA.
8. “Statistically Quantitative Volume Visualization”, Joe Kniss, Robert Van Uiter, Abraham Stephens, Guo-Shi Li, Tolga Tasdizen, Charles Hansen, IEEE Visualization 2005, pp. 287-294, Minneapolis, MN.
9. “Interactive Caustics Using Local Precomputed Irradiance”, Chris Wyman, Charles Hansen, Peter Shirley, Pacific Graphics 2004, pp. 143-151, Korea.
10. “Visualization of Intricate Flow Structures for Vortex Breakdown Analysis”, X. Tricoche, C. Garth, G. Kindlmann, E. Deines, G. Scheuermann, M. Ruetten, C. Hansen, IEEE Visualization 2004, pp. 187-194, Austin, TX.
11. “Constrained Inverse Volume Rendering for Planetary Nebulae” Marcus Magnor, Gordon Kindlmann, Charles Hansen, Neb Duric IEEE Visualization 2004, pp. 83-90, Austin, TX.
12. “Scout: A Hardware-Accelerated System for Quantitatively Driven Visualization and Analysis”, Patrick McCormick, Jeff Inman, James Ahrens, Greg Roth and Charles Hansen IEEE Visualization 2004, pp.171-178, Austin, TX.
13. “Adaptive Temporal Tone Mapping” Shaun D. Ramsey, Tom Johnson and Charles Hansen Computers, Graphics, and Imaging 2004 (CGIM 2004), pp. 124-128, Hawaii.
14. “Efficient Rendering of Atmospheric Phenomena”, Kirk Riley, David Ebert, Martin Kraus, Jerry Tessendorf, and Charles Hansen 2004 Eurographics Symposium on Rendering, pp. 375-386, Norrkoping, Sweden.
15. “Medical Applications of Multi-field Volume Rendering”, Joe Kniss, Juegen P. Schulze, Uwe Wossner, Peter Winkler, Ulrich Lang, Charles Hansen , VisSym 2004, Joint EUROGRAPHICS - IEEE TCCG Symposium on Visualization, pp. 249-254, Konstanz, Germany.

16. “Interactive Deformation and Visualization of Level Set Surfaces Using Graphics Hardware”, Aaron E. Lefohn, Joe M. Kniss, Charles D. Hansen, Ross T. Whitaker, IEEE Visualization 2003, pp. 75-82, Seattle.
17. “Visually Accurate Multi-Field Weather Visualization”, Kirk Riley, David Ebert, Charles Hansen, Jason Levit, IEEE Visualization 2003, pp. 279-286, Seattle.
18. “Gaussian Transfer Functions for Multi-Field Volume Visualization”, Joe Kniss, Simon Premoze, Milan Ikits, Aaron Lefohn, Charles Hansen, Emil Praun IEEE Visualization 2003, pp. 497-504, Seattle.
19. “A Constraint-Based Technique for Haptic Volume Exploration”, Milan Ikits, J. Dean Brederson, Charles D. Hansen, Christopher R. Johnson, IEEE Visualization 2003, pp. 263-270, Seattle.
20. “Distributed Interactive Ray Tracing for Large Volume Visualization”, David E DeMarle, Steven Parker, Mark Hartner, Christiaan Gribble, Charles Hansen, IEEE Parallel Visualization and Graphics 2003, pp. 87-94, Seattle.
21. “Simplification of Arbitrary Polyhedral Meshes”, Shaun D. Ramsey, Martin Bertram, Charles Hansen, IASTED Computer Graphics and Imaging 2003 (CGIM 2003), pp. 117-222, Honolulu.
22. “Penumbra Maps: Approximate Soft Shadows in Real-Time”, Chris Wyman, Charles Hansen, Eurographics Rendering Symposium 2003, pp. 202-207, Leuven, Belgium.
23. “A Real-Time Cloud Modeling, Rendering, and Animation System”, Joshua Schpok, Joseph Simons, David S. Ebert, Charles Hansen, ACM Symposium on Computer Animation, 2003 pp. 160 - 166, San Diego.
24. “A Comprehensive Calibration and Registration Procedure for the Visual Haptic Workbench”, Milan Ikits, Charles D. Hansen and Christopher R. Johnson, Eurographics Workshop on Virtual Environments 2003, pp. 247-254, Zurich, Switzerland.
25. “Hardware-Accelerated Interactive Illustrative Stipple Drawing of Polygonal Objects”, Lu, A., Taylor, J., Hartner, M., Ebert, D., Hansen, C., VMV2002: Vision, Modeling, and Visualization, November 2002, pp. 61-68, Erlangen, Germany
26. “Interactive Ray Tracing of Time Varying Data”, Erik Reinhard, Charles Hansen and Steve Parker, EUROGRAPHICS Workshop on Parallel Graphics and Visualization 2002, September 2002, Germany
27. “Semotus Visum: A Flexible Remote Visualization Framework”, Eric Luke and Charles Hansen, IEEE Visualization 2002, pp. 61-68, Boston, MA.
28. “Interactive Translucent Volume Rendering and Procedural Modeling”, Joe Kniss, Simon Premoze, Charles Hansen, and David Ebert, IEEE Visualization 2002, pp. 109-116, Boston, MA. **(Nominated for 'Best Paper' award)**
29. “Non-Photorealistic Volume Rendering Using Stippling Techniques”, Aidong Lu, Christopher J. Morris, David Ebert, Penny Rheingans, Charles Hansen, IEEE Visualization 2002, pp. 211-218, Boston, MA. **(Awarded 'Best Paper' at the conference)**
30. “Volume Rendering Multivariate Data to Visualize Meteorological Simulations: A Case Study”, Joe Kniss, Charles Hansen, Michel Grenier, and Tom Robinson, VisSym 2002, Joint EUROGRAPHICS - IEEE TCCG Symposium on Visualization, pp. 189-194, Barcelona, SPAIN

31. "Interactive Volume Rendering Using Multi-Dimensional Transfer Functions and Direct Manipulation Widgets", Joe Kniss, Gordon Kindlmann, Charles Hansen IEEE Visualization 2001, pp. 255-262, San Diego, Ca. (**Awarded 'Best Paper' at the conference**)
32. "Wavelet Representation of Contour Sets", Martin Bertram, Daniel Laney, Mark Duchaineau, Charles Hansen, Bernd Hamann, Kenneth Joy, IEEE Visualization 2001, pp. 303-310, San Diego, Ca.
33. "Parallel Point Reprojection", Erik Reinhard, Peter Shirley, Charles Hansen, IEEE Parallel Visualization and Graphics 2001, pp. 29-36, San Diego, Ca.
34. "Calibration of 6DOF Electromagnetic Tracking Devices", Milan Ikits, J. Dean Brederson, Charles Hansen, John M. Hollerbach, IEEE VR2001, pp. 63-70, Japan.
35. "The Visual Haptic Workbench", J.D. Brederson, M. Ikits, C. Johnson, and C. Hansen, Fifth PHANToM Users Group Workshop (PUG 00), Aspen, Co.
36. "Level-Of-Detail Volume Rendering via 3D Textures", Manfred Weiler, Rüdiger Westermann, Charles Hansen, Kurt Zimmerman, Thomas Ertl, Volume Visualization Symposium 2000, October 2000, pp. 7-13, SLC, Utah.
37. "A Comparison of Parallel Compositing Techniques on Shared Memory Architectures", Erik Reinhard and Charles Hansen, EUROGRAPHICS Workshop on Parallel Graphics and Visualization 2000, September 2000, pp. 115-124, Spain.
38. "Dynamic Acceleration Structures for Interactive Ray Tracing", Erik Reinhard, Brian Smits and Charles Hansen, EUROGRAPHICS Rendering Workshop, June 2000, pp. 299-307.
39. "A Case Study of Isosurface Extraction Algorithm Performance", Philip M. Sutton, Charles D. Hansen, Han-Wei Shen, and Dan Schikore, VisSym '00, Joint EUROGRAPHICS - IEEE TCCG Symposium on Visualization, May 2000, pp. 259-268, Amsterdam.
40. "Computational Steering and the SCIRun Integrated Problem Solving Environment", Steven Parker, Michelle Miller, Charles Hansen and Christopher Johnson, Proceedings of Dagstuhl '97 Workshop on Scientific Visualization, Hans Hagen, Greg Nielson, and Frits Post, Editors, IEEE Computer Society, pp. 257-266, 2000. (Invited and peer reviewed)
41. "Isosurface Extraction in Time-varying Fields Using a Temporal Branch-on-Need Tree (T-BON)", P. Sutton and C. Hansen, IEEE Visualization 1999, October 1999, pp. 147-154, San Francisco.
42. "Towards interactive photorealistic rendering of indoor scenes: A hybrid approach", T. Udeshi and C. Hansen, Rendering Techniques '99, Proceedings of the EUROGRAPHICS Rendering Workshop, pp. 63-76, June, 1999, in Granada, Spain.
43. "Parallel Lumigraph Reconstruction", P-P. Sloan and C. Hansen, Parallel Visualization and Graphics Symposium 1999, October 1999, pp. 7-14, San Francisco.
44. "Parallel Multipipe Rendering for Very Large Isosurface Visualization", T. Udeshi and C. Hansen, VisSym '99, Joint EUROGRAPHICS - IEEE TCCG Symposium on Visualization, pp. 99-108, May 26-28, 1999, in Vienna, Austria.
45. "Interactive Ray Tracing", S. Parker, W. Martin, P-P Sloan, P. Shirley, B. Smits, C. Hansen 1999 ACM Symposium on Interactive 3D Graphics, pp. 119-126, April 26-28, 1999, in Atlanta, Ga.
46. "Parallel Methods for Isosurface Visualization", T. Udeshi, S. Parker, C. Hansen, and P. Shirley, Ninth SIAM Conference on Parallel Processing for Scientific Computing, March 1999, CDROM.

47. "Simulation Steering with SCIRun in a Distributed Environment", M. Miller, C. Hansen, C. Johnson, *Applied Parallel Computing, 4th International Workshop, PARA '98*, Lecture Notes in Computer Science, No. 1541, B. Kågström, J. Dongarra, E. Elmroth and J. Wasniewski (editors), Springer-Verlag, Berlin, 1998, pp. 366-376
48. "Interactive Ray Tracing for Isosurface Extraction", S. Parker, P. Shirley, Y. Livnat, C. Hansen, P-P. Sloan, *Visualization '98*, October 1998, pp. 233-238, RTP, NC. (**Awarded 'Best Paper' at the conference**)
49. "View Dependent Isosurface Extraction", Yarden Livnat and Charles Hansen, *Visualization '98*, October 1998, pp. 175-180, RTP, NC.
50. "An Integrated Problem Solving Environment: The SCIRun Computational Steering System", Steve Parker, Michelle Miller, Charles Hansen, Chris Johnson, HICSS-31 '98, Vol VII, pp. 147-156, IEEE-Press, January 1998
51. "Parallel Rendering Techniques for Massively Parallel Visualization", Charles Hansen, Michael Krogh, James Painter, *International Symposium on Parallel Algorithms/Architecture Synthesis*, pp. 276-281, March 1997 Aizu-Wakamatsu, Japan
52. "Parallel Sphere Rendering", James Painter, Michael Krogh, Charles Hansen, *EUROGRAPHICS Workshop on Parallel Graphics and Visualization*, September 1996, Bristol, England
53. "Isosurfacing in Span Space with Utmost Efficiency (ISSUE)", H-W Shen, Charles Hansen, Yarden Livnat, Chris Johnson, *Visualization '96*, October 1996, pp. 287-294, San Francisco, Ca.
54. "Binary-Swap Shear-Warp Volume Renderer on the T3D", Roy Troutman and Charles Hansen, *Cray Users Group Conference*, September 1995, pp. 93-102, Fairbanks, Ak.
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56. "Massively Parallel Visualization: Parallel Rendering", Charles Hansen, Michael Krogh and William White, *SIAM Parallel Computation Conference*, February 1995, San Francisco, Ca.
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61. "Geometric Optimization", Paul Hinker and Charles Hansen, *Visualization '93*, San Jose, Ca., pp. 189-195, October 1993
62. "A Data Distributed, Parallel Algorithm for Ray-Traced Volume Rendering", Kwan-Liu Ma, James Painter, Charles Hansen, Michael Krogh, *Parallel Rendering Symposium '93*, San Jose, Ca., pp. 15-22, October 1993

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65. "Massively Parallel Isosurface Extraction", Charles Hansen and Paul Hinker, Visualization '92, Boston, Ma., pp. 77-83, October 1992
66. "The Impact of Gigabit Networking on Imaging", Charles Hansen and Stephen Tenbrink, Digital Imaging, Anaheim, Ca. pp. 191-194, April 1991
67. "CAD-Based 3-D Object Recognition", Tom Henderson, Charles Hansen, and Rod Grupen, IEEE Systems, Man and Cybernetics Conference, Boston, Ma, pp. 168-172, November 1989.
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2. “Scout: A GPU-Accelerated Language for Visualization and Analysis”, Patrick McCormick, Jeff Inman, Greg Roth, James Ahrens and Charles Hansen Poster in ACM Workshop on General Purpose Computing on Graphics Processors, Los Angeles 2004.
3. “A Prototype System For Synergistic Data Display”, J.D. Brederson, M. Ikits, C. Johnson, and C. Hansen, In *IEEE Virtual Reality 2001*, Special Topics Workshop, The Future of VR and AR Interfaces: Multi-modal, Humanoid, Adaptive and Intelligent, Japan 2001, pp. 3-5.
4. “Interactive Source Imaging with BioPSE”, D. Weinstein, L. Zhukov, C. Johnson, S. Parker, R. Van Uitert, R. MacLeod, and C. Hansen, Chicago 2000 World Congress on Medical Physics and Biomedical Engineering, Chicago, IL., July 2000.
5. “The SCIRun Problem Solving Environment: Implementation within a Distributed Environment”, Michelle Miller, Charles Hansen, and Chris Johnson, extended abstract, Ninth SIAM Conference on Parallel Processing for Scientific Computing, CDROM, 1999
6. “Development of an Interactive Reservoir Simulation and Visualization System for a Massively Parallel Processor”, W.B. Tung, C.D. Hansen, D.R. Jones, W.H. Chen, and H.A. Al-Sunaidi, 5th ARCHIE Conference: Visualization Technology to Find and Develop more Oil and Gas, pp. 105-107, The Woodlands, Texas, May, 1995.
7. “High-level Tools for Scientific Visualization”, Charles Hansen, Computer Use By Engineers (CUBE) Symposium, Sante Fe, NM., November, 1990
8. “Efficient Depth Estimation using Trinocular Stereo”, Charles Hansen, Nicolas Ayache, and Francis Lustman, SPIE Conference on Intelligent Robots, Cambridge, Massachusetts, November, 1988
9. “The Synthesis of Logical Sensor Specifications,” Thomas C. Henderson, Charles Hansen and Bir Bhanu, SPIE Conference on Intelligent Robots, Cambridge, Massachusetts, September, 1985.
10. “Distributed Control in the Multi-sensor Kernel System,” Thomas C. Henderson, Bir Bhanu and Charles Hansen, SPIE Conference on Intelligent Robots, Cambridge, Massachusetts, November, 1984, pp. 253-255.
11. “Logical Sensor Specification,” Thomas C. Henderson, Charles Hansen, Esther Shilcrat and Wu So Fai, SPIE Conference on Intelligent Robots, Cambridge, Massachusetts, November 1983, pp. 578-583.

### Unrefereed Publications

1. “So Much Data, So Little Time...”, Charles Hansen, Steve Parker, Christiaan Gribble, *Proceedings of Parallel Computing 2003*, Invited Paper, To Appear
2. “Graphics Applications for Grid Computing”, Charles Hansen and Chris Johnson Guest editors’ introduction, IEEE Computer Graphics and Applications, Vol. 23, No. 2, March 2003, pp. 20-21.
3. “EUROGRAPHICS ’97 Conference Report”, Charles Hansen , *Computer Graphics Quarterly*, Vol. 32, No. 1, February 1998, pp 39.

4. "EUROGRAPHICS '97: Budapest, Hungary, September 4-8, 1997: Meeting Report", Charles Hansen, *Computer Graphics Forum*, Vol. 16: , No. 5, February 1998, pp 323-324.
5. "Recent Developments in Parallel Rendering" Scott Whitman, Charles D. Hansen and Thomas W. Crockett. Guest editors' introduction, *IEEE Computer Graphics and Applications*, Vol. 14, No. 4, July 1994, pp. 21-22.
6. "Parallel Rendering," Chuck Hansen, Tom Crockett, and Scott Whitman, Guest editors' introduction, *IEEE Parallel and Distributed Technology*, Vol. 2, No. 2, Summer 1994, p. 7.
7. "A Data Distributed Parallel Algorithm for Ray-Traced Volume Rendering," Kwan-Liu Ma, James S. Painter, Charles D. Hansen, and Michael F. Krogh, ICASE Report No. 93-59 (NASA CR 191520), Institute for Computer Applications in Science and Engineering, NASA Langley Research Center, Hampton, VA, Aug. 1993.
8. "Visualization '91 Workshop Report: Scientific Visualization Environments", Charles Hansen and Dave Butler, *Computer Graphics Quarterly*, Vol. 26, No. 3, August 1992, pp 213-216.

### **Community Service**

1. "Member, Oakridge Elementary Community Council", August 2000-May 2004
2. "President Oakridge Elementary Community Council", May 2002-May 2003
3. "Board of Directors, Brighton Competition Team, August 2003-present

### **Consulting**

1. Lawrence Livermore Laboratories, 1998-present
2. Ohio State Supercomputing Center, 2001