

# Steven G. Parker

Vita  
As of April 16<sup>th</sup>, 2007

## Personal Information

Name: Steven G. Parker  
Address: Scientific Computing and Imaging Institute  
School of Computing  
50 S. Central Campus Dr, Room 3490  
University of Utah  
Salt Lake City, UT 84112  
Email: sparker@cs.utah.edu  
Phone: (801) 585-1504  
Place of Birth: Ft. Benning, Georgia  
Date of Birth: July 25, 1968

## Education

B.S. 1992 University of Oklahoma Electrical Engineering  
Ph.D. 1999 University of Utah, Salt Lake City Computer Science

## Professional Employment

Date	Position	Institution
2006–Present	Assistant Professor	University of Utah
2000–2006	Research Assistant Professor	University of Utah
1997–2000	Computer Professional	University of Utah
1994–97	DOE Computational Science Graduate Fellow	University of Utah
1993–94	Research Assistant	University of Utah
1992–93	Teaching Assistant	University of Utah

## Scholarship

### Publications — Edited Books

1. *IEEE Symposium on Interactive Ray Tracing 2006 Proceedings, Salt Lake City, Utah USA, September 18-20, 2006*. Edited by Ingo Wald and Steven G. Parker. IEEE, 196 pages. ISBN 1-4244-0693-5

### Publications — Refereed Book Chapters

1. S.G. Parker, K. Zhang, K. Damevski, C.R. Johnson. “Integrating Component-Based Scientific Computing Software.” In *Parallel Processing for Scientific Computing*. Edited by M.A. Heroux, P. Raghavan, and H.D. Simon, SIAM Press, pp. 271-288. 2006. ISBN 0-89871-619-5.
2. L.C. McInnes, B.A. Allan, R. Armstrong, S.J. Benson, D.E. Bernholdt, T.L. Dahlgren, L.F. Diachin, M. Krishnan, J.A. Kohl, J.W. Larson, S. Lefantzi, J. Nieplocha, B. Norris, S.G. Parker, J. Ray, and S. Zhou. “Parallel PDE-Based Simulations Using the Common Component Architecture.” In *Numerical Solution of Partial Differential Equations on Parallel Computers*. Edited by A.M. Bruaset, P. Bjorstad, and A. Tveito, Springer, pp. 327–284. 2006. ISBN 3-540-29076-1
3. D.M. Weinstein, S.G. Parker, J. Simpson, K. Zimmerman, G. Jones. “Visualization in the SCIRun Problem-Solving Environment.” In *The Visualization Handbook*. Edited by C.D. Hansen and C.R. Johnson, Elsevier, pp. 615–632. 2005. ISBN: 0-12-387582-X
4. S. Parker. “Interactive Ray Tracing on a Supercomputer.” In *Practical Parallel Rendering*. Edited by Alan Chalmers, Timothy Davis, and Erik Reinhard, AK Peters, Natick, Mass. pp. 187–215. 2002. ISBN: 1-56881-179-9
5. Y. Livnat, S. Parker, and C.R. Johnson. “Fast isosurface extraction methods for large imaging datasets.” In *Handbook of Medical Image Processing: Processing and Analysis Mangement*. Isaac Bankman, Editor-in-chief, Academic Press, San Diego. pp. 731–746. 2000. ISBN: 0-12-077790-8
6. S.G. Parker, D.M. Weinstein, and C.R. Johnson. “The SCIRun computational steering software system.” In *Modern Software Tools in Scientific Computing*. Edited by E. Arge, A. M. Bruaset and H. P. Langtangen, Birkhauser Press, Boston, Mass. pp. 5–44. 1997. ISBN: 0817639748

### Publications — Refereed Journals

7. S.G. Parker, J. Guilkey, T. Harman. "A Component-based Parallel Infrastructure for the Simulation of FluidStructure Interaction." *Engineering with Computers*. Springer London, published online November 18, 2006. <http://www.springerlink.com/content/b03056k8q418w728>
8. I. Wald, T. Ize, A. Kensler, A Knoll, S.G. Parker. "Ray Tracing Animated Scenes using Coherent Grid Traversal." *ACM Transactions on Graphics, Proceedings of ACM SIGGRAPH 2006, Boston, MA*. ACM, Vol 25, No. 3, pp. 485-493, July 2006.
9. I. Altintas, O. Barney, Z. Cheng, T. Critchlow, B. Ludaescher, S. Parker, A. Shoshani, M. Vouk. "Accelerating the Scientific Exploration Process with Scientific Workflows." *Journal of Physics: Conference Series*. Institute of Physics Publishing, Vol. 46, pp. 468–478. 2006.
10. G. Kumfert, D.E. Bernholdt, T. Epperly, J. Kohl, L.C. McInnes, S. Parker, J. Ray. "How the Common Component Architecture Advances Computational Science." *Journal of Physics: Conference Series*. Institute of Physics Publishing, Vol. 46, pp. 479–493. 2006.
11. 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, B. Hamann. "VACET: Proposed SciDAC2 Visualization and Analytics Center for Enabling Technologies." *Journal of Physics: Conference Series*. Institute of Physics Publishing, Vol. 46, pp. 561–569. 2006
12. C. Wyman, S. Parker, P. Shirley, C. Hansen. "Interactive Display of Isosurfaces with Global Illumination." *IEEE Transactions on Visualization and Computer Graphics*. IEEE. Vol. 12, No. 2, pp. 186–196. 2006.
13. R. Armstrong, G. Kumfert, L.C. McInnes, S. Parker, B. Allan, M. Sottile, T. Epperly, T. Dahlgren. "The CCA Component Model for High- performance Scientific Computing." *Concurrency and Computation: Practice & Experience*. John Wiley and Sons Ltd. Vol. 18, Issue. 2, pp. 215–229. 2006.
14. S. Parker. "A Component-Based Architecture for Parallel Multi- Physics PDE Simulation." *Future Generation Computer Systems*. Elsevier, Vol. 22, Issues 1–2, pp. 204–216. 2006.
15. Y. Alexeev, B.A. Allan, R.C. Armstrong, D.E. Bernholdt, T.L. Dahlgren, D. Gannon, C.L. Janssen, J.P. Kenny, M. Krishnan, J.A. Kohl, G. Kumfert, L.C. McInnes, J. Nieplocha, S.G. Parker, C. Rasmussen, and T.L. Windus. "Compenent-based Software for High-Performance Scientific Computing." *Journal of Physics: Conference Series SciDAC 2005*. Institute of Physics Publishing, Vol. 16, pp. 536–540. 2005.
16. D. DeMarle, C. Gribble, S. Boulos, and S. Parker. "Memory Sharing for Interactive Ray Tracing on Clusters." *Parallel Computing*. Elsevier, Vol. 31, No. 2, pp. 221–242. 2005.
17. C.R. Johnson, R.S. MacLeod, S.G. Parker, D.M. Weinstein. "Biomedical Computing and Visualization Software Environments." *Communications of the ACM*. Vol. 47, No. 11, pp. 64–71. 2004.
18. J.D. de St. Germain, A. Morris, S.G. Parker, A.D. Malony, and S. Shende. "Integrating Performance Analysis in the Uintah Software Development Cycle." *International Journal of Parallel Programming*. Springer Science, Vol. 31, No. 1, pp. 35–53. 2003.
19. M. Cole and S. Parker. "Dynamic Compilation of C++ Template Code." *Scientific Programming*. Wiley, Vol. 11, No. 4, pp. 321–328. 2003.

20. W. Martin, E. Reinhard, P. Shirley, S. Parker, W. Thompson. “Temporally Coherent Interactive Ray Tracing.” *Journal of Graphics Tools*. AK Peters, Vol. 7, No. 2, pp. 41–48. 2002.
21. C.R. Johnson, S.G. Parker, D.M. Weinstein, and S. Heffernan. “Component-based Problem Solving Environments for Large-Scale Scientific Computing.” *Concurrency and Computation: Practice and Experience*. Wiley, Vol. 14, pp. 1337–1349. 2002.
22. K. Ma and S. Parker. “Massively Parallel Software Rendering for Visualizing Large-Scale Data Sets.” In *IEEE Computer Graphics and Applications*. Vol. 21, No. 4, pp. 72–83. 2001.
23. C. Johnson, S. Parker, C. Hansen, G. Kindlmann, and Y. Livnat. “Interactive Simulation and Visualization.” *IEEE Computer*. Vol. 32, No. 12, pp. 59–65. 1999.
24. S. Parker, M. Parker, Y. Livnat, P.-P. Sloan, C. Hansen and P. Shirley. “Interactive Ray Tracing for Volume Visualization.” *IEEE Transactions on Visualization and Computer Graphics*. Vol. 5, No. 3, pp. 238-250. 1999.
25. S.G. Parker, D. Beazley, and C.R. Johnson. “Computational Steering Software Systems and Strategies.” *IEEE Computational Science and Engineering*. Vol. 4, No. 4, pp. 50-59. 1997.

## Publications — Refereed Conferences

26. Thiago Ize, Ingo Wald, Chelsea Robertson, Steven G. Parker. “An Evaluation of Parallel Grid Construction for Ray Tracing Dynamic Scenes.” In *IEEE Symposium on Interactive Ray Tracing 2006 Proceedings, Salt Lake City, Utah, USA September 18 - 20, 2006*. Edited by Ingo Wald and Steven G. Parker. IEEE, pp. 47–55. 2006. ISBN 1-4244-0693-5
27. Aaron Knoll, Ingo Wald, Steven Parker, Charles Hansen. “Interactive Isosurface Ray Tracing of Large Octree Volumes.” In *IEEE Symposium on Interactive Ray Tracing 2006 Proceedings, Salt Lake City, Utah, USA September 18 - 20, 2006*. Edited by Ingo Wald and Steven G. Parker. IEEE, pp. 115–124. 2006. ISBN 1-4244-0693-5
28. James Bigler, Abe Stephens, Steven G. Parker. “Design for Parallel Interactive Ray Tracing Systems.” In *IEEE Symposium on Interactive Ray Tracing 2006 Proceedings, Salt Lake City, Utah, USA September 18 - 20, 2006*. Edited by Ingo Wald and Steven G. Parker. IEEE, pp. 187–195. 2006. ISBN 1-4244-0693-5
29. C.P. Gribble, A.J. Stephens, J.E. Guilkey, and S.G. Parker. “Visualizing Particle-Based Simulation Datasets on the Desktop.” In *Proceedings of British HCI Group Workshop on Combining Visualization and Interaction to Facilitate Scientific Exploration and Discovery*. ACM. pp. (to appear). 2006.
30. V. Pegoraro and S.G. Parker. “Physically-Based Realistic Fire Rendering” *Proceedings of the Eurographics Workshop on Natural Phenomena*, pp. 51-59. 2006.
31. C.P. Gribble, S.G. Parker. “Enhancing Interactive Particle Visualization with Advanced Shading Models.” *ACM Siggraph Third Symposium on Applied Perception in Graphics and Visualization*. ACM. July 2006.
32. J. Bigler, J. Guilkey, C. Gribble, C. Hansen, and S. Parker. “A Case Study: Visualizing Material Point Method Data.” *Eurographics/IEEE VGTC Symposium on Visualization*, May 2006.

33. M. Cole, F.B. Sachse, D.M. Weinstein, S.G. Parker, and R.M. Kirby. "A Software Framework for Solving Problems of Bioelectricity Applying High-Order Finite Elements." *Proceedings of the IEEE Engineering in Medicine and Biology Society 26th Annual International Conference*. IEEE, Vol. 1, pp. 821–824. 2004.
34. Kostadin Damevski, and Steven Parker. "Imprecise Exceptions in Distributed Parallel Components." *Proceedings of the 10th International Euro-Par Conference, Lecture Notes in Computer Science*. Springer, Vol. 3149, pp. 108–116. August/September 2004.
35. D.E. DeMarle, C.P. Gribble, and S.G. Parker. "Memory-Savvy Distributed Interactive Ray Tracing." *Proceedings of the 6th Eurographics Symposium on Parallel Graphics and Visualization*. Edited by Dirk Bartz, Bruno Raffin and Han-Wei Shen, The Eurographics Association. 8 pages. 2004.
36. R.S. Macleod, D.M. Weinstein, J.D. de St. Germain, D.H. Brooks, C.R. Johnson, and S.G. Parker. "SCIRun/BioPSE: Integrated Problem Solving Environment for Bioelectric Field Problems and Visualization." In *Proceedings of the International Symposium on Biomedical Imaging*. Arlington, Va, IEEE, pp. 640–643. April 2004.
37. K. Zhang, K. Damevski, V. Venkatachalapathy, and S. Parker. "SCIRun2: A CCA Framework for High Performance Computing." *Proceedings of the 9th International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS 2004)*. IEEE, pp. 72-79. 2004.
38. D. Demarle, S. Parker, M. Hartner, C. Gribble, and C. Hansen. "Distributed Interactive Ray Tracing for Large Volume Visualization." *IEEE Symposium on Parallel Visualization and Graphics*. Seattle, Wa., IEEE, pp. 87–94. 2003.
39. K. Damevski, and S. Parker. "Parallel Remote Method Invocation and M-by-N Data Redistribution." *Proceedings of the 4th Los Alamos Computer Science Institute Symposium*. (published on CD), 10 pages. 2003.
40. J.D. de St. Germain, A. Morris, S.G. Parker, A.D. Malony, and S. Shende. "Integrating Performance Analysis in the Uintah Software Development Cycle." *Proceedings of the 4th International Symposium on High Performance Computing (ISHPC-IV)*. IEEE, pp. 190–206. May 15-17, 2002.
41. S.G. Parker "A Component-based Architecture for Parallel Multi- Physics PDE Simulation." *Proceedings of the International Conference on Computational Science (ICCS) 2002*. Vol. 2331, pp. 719–734. April 21-24, 2002.
42. E. Reinhard, C. Hansen, and S. Parker. "Interactive Ray Tracing of Time Varying Data." *Proceedings of the 4th EUROGRAPHICS Workshop on Parallel Graphics and Visualization 2002*. Germany, The Eurographics Association, pp. 77–82. September 2002.
43. M. Cole and S. Parker. "Dynamic Compilation of C++ Template Code." *Fourth Workshop on Parallel/High-Performance Object-Oriented Scientific Computing (POOSC'01) at the ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA'01)*. Tampa Bay, Fl, ACM, pp. 28–36, October 2001.
44. J. McCorquodale, D. de St. Germain, S. Parker, and C.R. Johnson. "The Uintah Parallelism Infrastructure: A Performance Evaluation on the SGI Origin 2000." In *High Performance Computing 2001 Grand Challenges in Computer Simulation, 2001 Advanced Simulation Technologies Conference*. Seattle, Edited by Adrian Tentner, The Society for Modeling and Simulation International, pp. 92–97. April 22-26, 2001.

45. C. Johnson, S. Parker, and D. Weinstein. "Large-Scale Computational Science Applications Using the SCIRun Problem Solving Environment." In *Proceedings of the International Supercomputer Conference (ISC)*. 19 pages. 2000.
46. R. Rawat, S. Parker, P. Smith, and C. Johnson. "Parallelization and Integration of Fire Simulations in the Uintah PSE." *Proceedings of the Tenth SIAM Conference on Parallel Processing for Scientific Computing*. ACM, Portsmouth, Virginia. March 12–14, 2001.
47. J. Davison de St. Germain, J. McCorquodale, S. G. Parker, and C. R. Johnson. "Uintah: A Massively Parallel Problem Solving Environment." *HPDC'00: Ninth IEEE International Symposium on High Performance and Distributed Computing*. IEEE, pp. 33–42, August 2000.
48. Y. Livnat, C. D. Hansen, S. G. Parker, and C. R. Johnson. "Isosurface extraction for large-scale data sets." In *Proceedings of Scientific Visualization - Dagstuhl 2000*. Edited by Frits Post, 12 pages. 2000.
49. S. G. Parker, M. Miller, C. D. Hansen, and C. R. Johnson. "Computational Steering and the SCIRun Integrated Problem Solving Environment." In *Proceedings of Scientific Visualization - Dagstuhl 2000*. Edited by Hans Hagen, pp. 267-276, 2000.
50. R. Armstrong, D. Gannon, A. Geist, K. Keahey, S. Kohn, L. McInnes, S. Parker, and B. Smolinski. "Toward a Common Component Architecture for High-Performance Scientific Computing." *Proceedings of 8<sup>th</sup> IEEE International Symposium on High Performance Distributed Computing (HPDC) '99*. August 1999.
51. S. Parker, P. Shirley, Y. Livnat, C. Hansen, P.-P. Sloan, and M. Parker. "Interacting with Gigabyte Volume Datasets on the Origin 2000." The 41<sup>st</sup> Annual Cray User's Group Conference. 1999.
52. S. Parker, W. Martin, P.-P. Sloan, P. Shirley, B. Smits, and C. Hansen. "Interactive Ray Tracing." *Symposium on Interactive 3D Graphics*. ACM, pp. 119–126. 1999.
53. B. Walter, G. Drettakis and S. Parker, "Interactive Rendering Using the Render Cache." *Rendering Techniques '99 (Proceedings of the 10<sup>th</sup> Eurographics Workshop on Rendering)*. Edited by G. Larson and D. Lischinski, Springer-Verlag/Wien, New York, Vol. 10, pp. 235–246. 1999.
54. S.G. Parker, P. Shirley, Y. Livnat, C. Hansen, and P. Sloan. "Interactive Ray Tracing for Isosurface Rendering." *IEEE Visualization '98*. IEEE, pp. 233–238. October, 1998.
55. M. Miller, C. Hansen, S.G. Parker, C.R. Johnson. "Simulation Steering with SCIRun in a Distributed Memory Environment." In *Seventh IEEE International Symposium on High Performance Distributed Computing (HPDC-7)*. July, 1998.
56. S.G. Parker, M. Miller, C.D. Hansen, and C.R. Johnson. "An Integrated Problem Solving Environment: the SCIRun Computational Steering System." *31<sup>st</sup> Hawaii International Conference on System Sciences (HICSS-31)*. Edited by H. El-Rewini, IEEE, Vol. 7, pp. 147–156. January, 1998.
57. C.R. Johnson and S.G. Parker. "Applications in Computational Medicine using SCIRun: A Computational Steering Programming Environment." *Supercomputer '95*. Edited by H.W. Meuer, Springer-Verlag, pp. 2–19. 1995.
58. C.R. Johnson and S.G. Parker. "A Computational Steering Model for Problems in Medicine." *Supercomputing '94*. IEEE Press, pp. 540–549, 1994.

59. D.M. Weinstein, S.G. Parker, and C.R. Johnson. "A Physically Based Mesh Generation Algorithm: Applications in Computational Medicine." *IEEE Engineering in Medicine and Biology Society 16<sup>th</sup> Annual International Conference*. IEEE Press, pp.718–719. 1994.

## Publications — Extended Abstracts and Short Papers

60. C.P. Gribble and S.G. Parker. "An Experimental Design for Determining the Effects of Illumination Models in Particle Visualization." *ACM Siggraph Second Symposium on Applied Perception in Graphics and Visualization*, August 2005.
61. S.G. Parker and J.D. de St. Germain. "Software Integration in an Academic Environment." presentation at DOE Software Quality Forum, 2003.
62. D. Weinstein, L. Zhukov, C. Johnson, S. Parker, R. Van Uitert, R. MacLeod, and C. Hansen. "Interactive Source Imaging with BioPSE." Chicago 2000 World Congress on Medical Physics and Biomedical Engineering, Chicago, IL. July 2000.
63. C. Johnson and S. Parker. "The SCIRun parallel scientific computing problem solving environment." extended abstract, *Ninth SIAM Conference on Parallel Processing for Scientific Computing (PP99)*, 2 pages. 1999.
64. C. Hansen, T. Udeshi, S. Parker, and P. Shirley. "Parallel Methods for Isosurface Visualization." extended abstract, *Ninth SIAM Conference on Parallel Processing for Scientific Computing*. 1999.
65. C. Johnson and S. Parker. "The SCIRun Parallel Scientific Computing Problem Solving Environment." extended abstract, *Ninth SIAM Conference on Parallel Processing for Scientific Computing*. 1999.
66. S.G. Parker and C.R. Johnson. "SCIRun: Interactive Computer Graphics to Scientific Problems." short paper *SIGGRAPH '96 Visual Proceedings: The Art and Interdisciplinary Programs of SIGGRAPH '96*. p. 111. 1996.

## Publications — Technical Reports

67. C.P. Gribble, T. Ize, A. Kensler, I. Wald, S.G. Parker. "A Coherent Grid Traversal Approach to Visualizing Particle-Based Simulation Data." Scientific Computing and Imaging Institute Technical Report, No. UUSCI-2006-024, University of Utah, July 2006.
68. C. Gribble, S.G. Parker, and C. Hansen. "Interactive Volume Rendering of Large Datasets Using the Silicon Graphics Onyx4 Visualization System." School of Computing Technical Report, No. UUCS-04-003, University of Utah, January 27, 2004.
69. C.P. Gribble and S.G. Parker. "A Survey of the Itanium Architecture from a Programmer's Perspective." SCI Institute Technical Report, No. UUSCI-2003-003, University of Utah, August 2003.

70. B. Martin, S. Parker, P. Shirley and W. Thompson, "Temporally Coherent Interactive Ray Tracing." School of Computing Technical Report, No. UUCS-01-005, University of Utah, May 2001.
71. S. Parker, P. Shirley, B. Smits. "Single Sample Soft Shadows." School of Computing Technical Report Technical Report, No. UUCS-98-019, University of Utah, October 1998.
72. S.G. Parker, D.M. Weinstein, and C.R. Johnson. "A Morphing Algorithm for Generating Near Optimal Grids: Applications in Computational Medicine." School of Computing Technical Report, No. UUCS-94-014, University of Utah, 1994.
73. S.G. Parker and C.R. Johnson. "Interactive Manipulation of Contour Data Using the Layers Program - User Guide." School of Computing Technical Report, No. UUCS-94-020, University of Utah. 1994.

### Invited Talks

74. CCT Colloquium, Center for Computation and Technology, Louisiana State University, 2007.

### Selected Presentations

75. C. Johnson and S. Parker, "Problem Solving Environments for DDDAS" presented at the minisymposium *Actually Doing Dynamic Data-driven Application Simulations* at the Ninth Copper Mountain Conference on Iterative Methods, Copper Mountain, Colorado, April 2–7, 2006.
76. S. Parker, "Composition of Components in Multiphysics Applications" presented at the minisymposium *Parallel Dynamic Data Management Infrastructures for Scientific & Engineering Applications* at the 12th SIAM Conference on Parallel Processing for Scientific Computing, San Francisco, February 21–24, 2006.
77. S. Parker, "Component-Based Multi-Physics Simulations of Fires and Explosions" presented at the minisymposium *Coupling Large-Scale Multi-physics: Formulations, Applications, Tools and Components* at the 12th SIAM Conference on Parallel Processing for Scientific Computing, San Francisco, February 21–24, 2006.
78. S. Parker, "Why do Software Engineering Methods Fail for HPC?" presented at *Architectures and Algorithms for Petascale Computing*, Dagstuhl Seminar 06071, Schloss Dagstuhl, Germany, February 12-17, 2006.
79. S. Parker, "Meta Component Architecture in SCIRun2" presented at the minisymposium *Design Patterns for High Performance Component Architectures* at the Eleventh SIAM Conference on Parallel Processing for Scientific Computing (PP04), San Francisco, California, February 25–27, 2004.
80. S. Parker, "Uintah: A Component Architecture for Parallel Multi- Physics PDE Simulation" presented at the minisymposium *Interfaces in Parallel Multi-Physics Simulations* at the Eleventh SIAM Conference on Parallel Processing for Scientific Computing (PP04), San Francisco, California, February 25–27, 2004.

## Educational and Popular Articles

81. Tom Johnson, S.G. Parker. "Adaptive Temporal Tone Reproduction" *University of Utah Undergraduate Research Abstracts*. Vol. 4, Spring 2004.
82. S.G. Parker. C-SAFE Uses Linux HPCC in Fire Research. *Syllabus, Technology for Higher Education*. Vol. 16, No. 7, 2 pages, February 2003.
83. C.R. Johnson and S.G. Parker. The SCIRun Problem Solving Environment: Applications in Computational Medicine. *SGI Graphics World*. Vol. 9, No. 9, September 1999.
84. C.R. Johnson and S.G. Parker. The SCIRun Problem Solving Environment: Applications in Computational Medicine, *HPC Contributions to Society*. 1999.
85. C.R. Johnson, D. McAllister, P.P. Sloan, and S. Parker. Computer Graphics. *MicroSoft Encarta CD ROM*. 1997.

## Images and Videos

86. C.R. Johnson and S.G. Parker. Slides and Videos. *Permanent Research Archives*, Smithsonian Museum of American History, 1998.

## Thesis

87. S.G. Parker. "The SCIRun Problem Solving Environment and Computational Steering Software System", *PhD Thesis*, University of Utah, 1999.

## Honors and Awards

- "People to Watch" list, HPCWire, 2006.
- Best Paper, "Design for Parallel Interactive Ray Tracing Systems," James Bigler, Abe Stephens, Steven G. Parker, IEEE Symposium on Interactive Ray Tracing 2006.
- Honors medal, Computer World, 2003.
- Best Paper, "Interactive Ray Tracing for Isosurface Rendering," IEEE Visualization '98.
- Finalist, science category, SCIRun, Computer World/Smithsonian Award, 1998.

- Computational Science Graduate Fellowship, Department of Energy, September 1994–June 1998.

## Research Interests

Problems in Computational Science:

- High Performance Computing
- Component Architectures
- Interactive Raytracing
- Computational Steering
- Scientific Visualization
- Computer Graphics
- Problem Solving Environments
- Parallel Programming
- Visual Programming

## Professional Activities

### Teaching

Taught CPSC4400 (Computer Systems), Fall 2006.

Teaching CS6620 (Advanced Computer Graphics II) Spring 2005, Spring 2006, Spring 2007.

Co-taught CS5210/6210 (Scientific Computing) Fall 2001.

Co-taught the course “Interactive Ray Tracing” at Siggraph 2001.

Co-taught the course “Systems Designs for Visualizing Large-Scale Scientific Data” at Siggraph 1999.

TA for CS 364, 365, and 366. Fall 1992, Spring 1993. Department nominee for College of Engineering Outstanding Teaching Assistant Award, 1993.

## Research Grants and Contracts

### Current Support

Supporting Agency:	Department of Energy
Total Costs:	approx. \$20,000,000
Responsible Portion:	approx. \$4,000,000
Title of Project:	Center for Simulation of Accidental Fires and Explosions
Duration:	5 years
Start Date:	30 September 2002
Principal Investigators:	David Pershing (PI), Chuck Wight (Co-PI) Greg Voth (Co-PI), Phil Smith (Co-PI), Pat McMurtry (Co-PI), Steven Parker (Co-PI)
Supporting Agency:	National Science Foundation
Total Costs:	\$506,243
Title of Project:	CRI: A Hierarchical data Storage System for Large Data Simulation, Comparison and Visualization
Duration:	5 years
Start Date:	15 March 2006
Principal Investigators:	Steven G. Parker (PI)
Supporting Agency:	Department of Energy
Total Costs:	\$40,000
Title of Project:	SCIDAC: Center for Plasma Edge Simulation
Duration:	1 years
Start Date:	15 January 2006
Principal Investigators:	Steven G. Parker (PI)
Supporting Agency:	Department of Energy
Total Costs:	\$1,355,931
Title of Project:	Hardware Support for Interactive Ray Tracing
Duration:	2 years
Start Date:	1 June 2006
Principal Investigators:	Erik Brunvand (PI); Steven Parker (Co-PI)
Supporting Agency:	National Science Foundation
Total Costs:	\$153,000
Title of Project:	CSR-AES: Interactive Parallel Platforms for Multi-Experiment Computational Studies
Duration:	3 years
Start Date:	15 August 2006
Principal Investigators:	Steven G. Parker (PI)

Supporting Agency: Department of Energy  
Total Costs: \$1,138,810  
Title of Project: Scientific Data Management: Center for Enabling Technologies  
Duration: 5 years  
Start Date: 1 July 2006  
Principal Investigators: Steven G. Parker (PI)

Supporting Agency: Department of Energy  
Total Costs: \$796,370  
Title of Project: Center for Technology for Advanced Scientific Component Software (TASCS)  
Duration: 5 years  
Start Date: 1 July 2006  
Principal Investigators: Steven G. Parker (PI)

Supporting Agency: Utah Office of Economic Development  
Total Costs: \$288,008  
Title of Project: Center for Interactive Ray-Tracing and Photo Realistic Visualization  
Duration: 2 years  
Start Date: July 1, 2005  
Principal Investigators: Steven Parker (PI)

Supporting Agency: Department of Energy  
Total Costs: \$2,628,630  
Title of Project: Visualization and Analytics Center for Enabling Technologies (VACET)  
Duration: 5 years  
Start Date: 15 September 2006  
Principal Investigators: Christopher R. Johnson (PI) and Steven G. Parker (Co-PI)

### Past Support

Supporting Agency: National Science Foundation  
Total Costs: \$80,412  
Title of Project: DDDAS-TMRP: Collaborative Research: Adaptive Data-Driven Sensor Configuration, Modeling, and Deployment for Oil, Chemical, and Biological Contamination near Coastal Facilities  
Duration: 1 year  
Start Date: October 10, 2005  
Principal Investigators: Christopher R. Johnson (PI) and Steven Parker (Co-PI)

Supporting Agency: Department of Energy  
Total Costs: \$391,824  
Title of Project: Scientific Data Management Integrated Software Infrastructure Center  
Duration: 2 years  
Start Date: 15 September 2004  
Principal Investigators: Steven Parker (PI)

Supporting Agency: Department of Energy  
Total Costs: \$1,071,971  
Title of Project: Center for Component Technology for Terascale Simulation Software  
Duration: 5 years  
Start Date: 15 August 2001  
Principal Investigators: Steven Parker (PI)

Supporting Agency: Silicon Graphics, Inc.  
Total Costs: \$21,000  
Title of Project: Toolkits for SGI Prism System  
Duration: 1 year  
Start Date: 1 February 2005  
Principal Investigators: Steven Parker (PI)

Supporting Agency: National Science Foundation  
Total Costs: \$443,400  
Title of Project: ITR/SY: Data Parallel Component Software Components  
Duration: 4 years  
Start Date: 7 August 2001  
Principal Investigators: Steven Parker (PI)

Supporting Agency: Department of Energy  
Total Costs: \$827,000  
Title of Project: Utah Advanced Visualization Technology Center  
Duration: 3 years  
Start Date: 1 August 2001  
Principal Investigators: Christopher R. Johnson (PI), Chuck Hansen (Co-PI), and Steven Parker (Co-PI)

Supporting Agency: Visual Influence  
Total Costs: \$15,361  
Title of Project: Isosurface Extraction/Flythrough  
Duration: 1 year  
Start Date: 1 Jan. 1999  
Principal Investigators: Christopher R. Johnson (PI) and Steven Parker

Supporting Agency: Department of Energy  
Total Costs: \$98,000  
Title of Project: Parallel Time-dependent Visualization  
Duration: 1 year  
Start Date: 1 August 2001  
Principal Investigators: Chuck Hansen (PI) and Steven Parker

## Professional Service

Board of Directors Member, Clark Planetarium, Salt Lake City, 2003–.

Voting Member, DOE Common Component Architecture Forum (CCA).

General Chair, 2006 IEEE Symposium on Interactive Ray Tracing (RT06).

Program Committee, 12th Annual International Conference on High Performance Computing 2005.

Program Committee, IEEE Visualization 2005.

Program Committee, 14th International Symposium on High Performance Distributed Computing (HPDC-14) 2005.

Program Committee, Challenges of Large Applications in Distributed Environments (CLADE) 2005.

International Program Committee, Seventh IASTED Conference on Computer Graphics and Imaging (CGIM) 2004.

Technical Papers Committee, Supercomputing 2004.

Program Committee, 9th International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS 2004).

Program Committee, Eighth ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP '01).

Moderator, National Conference on Undergraduate Research, 2003.

## Professional Societies

- Member of ACM and ACM Siggraph
- Member of IEEE and IEEE Computer Society

## Academic Committees

Advisory Committee for Creation of Graduate Degree in Design, Architecture 2006–present

Curriculum Committee 2006–present.

Information Technology Czar, SCI Institute, 2005–2006.

Graduate Admissions Committee 2003–2006.

Industrial Liason Committee 2003–2006.

University of Utah Computer Science Department Graduate Student Advisory Committee Member, Autumn 1994–Summer 1996

### PhD Students

A.N.M. Imroz Choudhury

Thiago Ize

Andrew Kensler

Vincent Pegoraro

Abraham Stephens

Keming Zhang

### MS Students

Jeremy Archuleta

Oscar Barney

Chelsea Robertson

Ashwin Deepak Swaminathan

Venkat Venkatachalapthy

### Graduated Students

Christiaan Gribble, PhD, Utah, 2006 “Interactive Methods for Effective Particle Visualization.”

Kostadin Damevski, PhD, Utah, 2006, “Component Model Interoperability for Scientific Computing”

Kostadin Damevski, MS, Utah, 2003 “Parallel Component Interaction with an Interface Definition Language Compiler”

David Demarle, MS, Utah, 2003 “Distributed Interactive Ray-tracing for Large Volume Visualization”