STEVEN M. CUTCHIN

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Education

- Ph.D. Computer Science, Dept. of Computer Sciences, Purdue University, August 2000. Thesis: Flexible User Interface Coupling with Operation Transformation
- M.S. in Computer Science, Dept. of Computer Sciences, Purdue University, May 1993.
- B.S. Double Major in Computer Science and Mathematics, Purdue University, May 1990.

Professional Experience

Aug 2017-Present	Joint Appointment Associate Professor Games Internet and Mobile Media Boise State University Boise ID
Aug 2016-Present	Director Research Computing Boise State University Boise ID
Aug 2013-Present	Associate Professor Department of Computer Science Boise State University Boise ID
Nov 2008-June 2013	Manager, Supercomputer Laboratory and Visualization and Virtual Reality Laboratory, King Abdullah University of Science and Technology, Thuwal, Kingdom of Saudi Arabia
June 2001-Nov 2008	Assistant Director, San Diego Supercomputer Center in charge of Visualization Research, and Production.
Nov 2000-June 2001	Visualization Scientist, San Diego Supercomputer Center, UCSD, La Jolla, CA.
Nov 1999-Nov 2000	Senior Software Engineer, Walt Disney Feature Animation, Walt Disney Studios, Burbank, CA.
May 1997 - Nov 1999	Research Scientist, Texas Institute for Computational and Applied Mathematics, University of Texas at Austin, TX
Aug 1991 - May 1997	Research Assistant, Department of Computer Sciences, Purdue University, West Lafayette, IN
Summer 1995	Summer Internship, Institute for Defense Analysis, Washington D.C
June 1990 - Aug 1991	Software Engineer, Intergraph Corporation, Huntsville, AL

Awards and Honors

- Invited Member Oculus NextGen Academic Research Program November 2017

- Winner KAUST Seed Fund Award for product development: Photo-real 3D Immersion, March 2012
- Best Visualization Display Award, Teragrid Conference, 2008
- Certificate of Recognition for Outstanding Accomplishment in Assistant Teaching, Purdue ACM Student Chapter, 1995.

Courses Taught

- Computer Graphics CS464, Boise State University Fall 2017
- VIP-VR Immersive Virtual Reality Fall 2017
- Data Structures CS321, Boise State University Spring 2017
- VIP-VR Immersive Virtual Reality Spring 2017
- Visualization Techniques, CS 564 Boise State University Fall 2016
- VIP -VR Immersive Virtual Reality Fall 2016
- VIP-VR Immersive Virtual Reality Summer 2016
- Data Structures CS321, Boise State University Spring 2016
- Introduction to Computer Graphics, Boise State University, Fall 2015
- Data Structures CS 321, Boise State University Spring 2015
- Visualization Techniques CS 564, Boise State University Fall 2014
- Data Structures CS 321, Boise State University Spring 2014.
- Introduction to Computer Graphics CS464, Boise State University Fall 2013
- Maya I Introduction to 3-D Modeling ART-40298, UCSD, Quarterly 2005-2008.
- Introduction to Scientific Visualization Short Course San Diego Supercomputer Center 2004-2008.
- Introduction to Tools for Large Data Scientific Visualization San Diego Supercomputer Center 2004-2008.

Panels

- National Science Foundation, Review Panel, NSF/Intel Partnership on Visual and Experiential Computing (VEC), May 27-28, 2015
- National Science Foundation, Office of Cyberinfrastructure (OCI) program on Strategic Technologies for Cyberinfrastructure, 2007
- NIH/NSF Fall 2004 workshop on Visualization Research Challenges - September 22-23, 2004.
- Modeling, Simulation and Gaming Technologies Applied to Education, September 27-29, 2004.

Research Interests

- Photo-realistic immersive capture and interaction systems.
- Ultra-high resolution display environments.
- Interactive gaming environments for science education.
- Terascale computational visualization techniques.
- High dynamic range lighting within visualization environments.
- Video systems for multi-panel environments.
- Collaborative virtual environments.
- Serious games and gaming environments.

Research Grants and Major Funding

- co-PI, A Snake river Plain Field Laboratory for Enhanced Geothermal Systems, Department of Energy, 2014, $400,000, one year.
- co-PI, CC*DNI Engineer: CI Engineer to Enhance Collaborative Research, NSF, 2015, $381,221, three years.
- co-PI, Precision Ag–Increasing Crop Yields Using Internet of Things (IoT) & Data Science., Idaoho Department of Commerce, 2015, $335,969, one year.
- co-PI, iSEED 'Statewide Integration of CyberInfrastructure Visualization for EPSCoR MILES project' 2014, $100,000, one year.
- PI, 6341 6PRJ000282 Virtual Reality Volume Visualization Idaho National Laboratory, Batelle Energy Alliance 2014,$60,000 one year.
- co-PI, KAUST-EPFL Brain Alliance Supercomputing Research Project, 2012, $1 Million US per year, 2 years.
- co-PI, 07-2-S6.02-9196 GSFC High Interactivity Visualization Software for Large Computational Data Sets NASA SBIR Phase 2 Grant 2007, $132,000, one year.
- co-PI, Collaborative Analysis Management System 2006 NIH SBIR Phase I Grant, Biotrue, Inc 2006, $132,000, one year.
- Project Manager, IT-E3Tools: Information Technology Engineering and Environmental Education Tools Award #ESI-0624672, ITEST, 2006.
- Manager, KAUST Supercomputing Facility, 2010-2012, $6 Million US per year.
- Manager, KAUST Visualization and Virtual Reality Facility, 2008-2012, $4 Million US per year.

Patents

- SYSTEM AND METHOD FOR GENERATING THREE-DIMENSIONAL PANORAMIC IMAGES Publication Number US20130057643.

Professional Memberships

- Association of Computing Machinery

Selected Works in Media

- Digital Recreation of a Seven Story Building Shake During an Earthquake featured at IEEE Vis 2007 Scientific Animation Theatre, Sacramento, Nov 2007
- Recreation of 1906 San Francisco Earthquake featured at the 100th Anniversary Earthquake Conference, San Francisco, Apr 2006
- LA's Future Quake show by National Geographic Channel featured TeraShake and Puente Hills Visualizations, Sep 2006
- Evolution of Universe Visualization featured at the Siggraph Dome Show, Los Angeles, Aug 2005
- Animations for Discovery Science Channels program 100 Greatest Discoveries in Chemistry, 2004

Graduate Students

- Suadad Jasim Computer Science, Boise State University, graduated Dec 2014.
- Jim Pelton Computer Science, Boise State University, expected graduation May 2017.
- Yuan Li Computer Science, Boise State University, expected graduation May 2017.
- Ujjwal Acharya, Boise State University, expected graduation May 2017.
- Iker Vazquez Lopez, Boise State University, expected graduation May 2017.
- Mike Ramshaw, Boise State University, expected graduation May 2018.

Undergraduate Research Students

- Afton Carlson, Computer Science, Boise State University, Expected Graduation May 2017
- Jonathon Stohler Boise State University. Graduated May 2016.
- Anh Tranh Boise State University. Graduated 2015.
- Jay Capcha Computer Science, Boise State University, Exepected Graduation May 2018.
- Michael Pleasance Computer Science, Boise State University, Expected Graduation May 2018.
- Lois Baek Computer Science, Boise State University, Expected Graduation May 2018.
- Huma Aatifi Computer Science, Boise State University, Expected Graduation Fall 2017.
- Alex Decastro Computer Science, Boise State University, Graduate Fall 2016.
- Ryan Bailey Computer Science, Boise State University, Expected Graduation May 2017.
- Jamie Capawana Computer Science, Boise State University, Expected Graduation May 2018.

Supervised Professional Staff Boise State Office of Information Technology

- Mendi Edgars Senior Grant Development Specialist Boise State Office of Information Technology.
- Kyle Shannon Systems Engineer Boise State Office of Information Technology.
- Kelly Byrne Systems Engineer Boise State Office of Information Technology.
- Phil Gore Student System Administrator Boise State Office of Information Technology.

- Tyler Bevan Systems Engineer Boise State Office of Information Technology.

Service Activity

- Steering Committee Member Idaho Virtual Reality Technology Council Fall 2016-Present.
- Lead Technical Development Program World Museum President's Office, Boise State University Aug 2016-Present.
- Director Research Computing Division Boise State Office of Information Technology Boise State University Aug 2016-Present.
- National Science Foundation West Big Data Hub Steering Committee Member Fall 2016-Present.
- National Science Foundation Web Big Data Hub All Hands Meeting Steering Committee co-Chair Fall 2016-Present.
- Chair Dean of Engineering Evaluation Committee Boise State University Spring 2016.

Journal Articles

[1] ThomasA. DeFanti, Daniel Acevedo, RichardA. Ainsworth, MaxineD. Brown, Steven Cutchin, Gregory Dawe, Kai-Uwe Doerr, Andrew Johnson, Chris Knox, Robert Kooima, Falko Kuester, Jason Leigh, Lance Long, Peter Otto, Vid Petrovic, Kevin Ponto, Andrew Prudhomme, Ramesh Rao, Luc Renambot, DanielJ. Sandin, JurgenP. Schulze, Larry Smarr, Madhu Srinivasan, Philip Weber, and Gregory Wickham. The future of the cave. *Central European Journal of Engineering*, 1(1):16–37, 2011.

[2] Suchit Jhunjhunwala, Menno C. van Zelm, Mandy M. Peak, Steve Cutchin, Roy Riblet, Jacques J. M. van Dongen, Frank G. Grosveld, Tobias A. Knoch, and Cornelis Murre. The 3d structure of the immunoglobulin heavy-chain locus: Implications for long-range genomic interactions. *Cell*, 133(2):265–279, 2008/03/24.

[3] Suchit Jhunjhunwala, Menno C van Zelm, Mandy M Peak, Steve Cutchin, Roy Riblet, Jacques JM van Dongen, Frank G Grosveld, Tobias A Knoch, and Cornelis Murre. Cell, volume 133 supplemental data the 3d structure of the immunoglobulin heavy-chain locus: Implications for long-range genomic interactions.

[4] Amit Chourasia, Steve Cutchin, and Brad Aagaard. Visualizing the ground motions of the 1906 san francisco earthquake. *Computers & Geosciences*, 34:1798–1805, 2008.

[5] A Chourasia, SM Cutchin, KB Olsen, B Minster, S Day, Y Cui, P Maechling, R Moore, and T Jordan. Insights gained through visualization for large earthquake simulations. *IEEE Comput Graph Appl (Discovering Unexpected)*, 27(5):28–34, 2007.

[6] JR Feramisco, S McMullen, J Sherman, K Hammond, MH Gao, A Decastro, C Chrisman, D Nadeau, J Genetti, S Cutchin, et al. 3-dimensional imaging of muscle and other cell types. 52:S7–S7, 2004.

[7] Vinod Anupam, Chandrajit Bajaj, Fausto Bernardini, Steve Cutchin, Jindon Chen, Daniel Schikore, Guoliang Xu, Peinan Zhang, and Weiping Zhang. Scientific problem solving in a

distributed and collaborative multimedia environment. *Mathematics and computers in simulation*, 36(4):433–442, 1994.

Conference Papers

[8] Iker Vazquez and Steve Cutchin. Synchronized scene views in mixed virtual reality for guided viewing. In Dirk Reiners, Daisuke Iwai, and Frank Steinicke, editors, *ICAT-EGVE 2016 - International Conference on Artificial Reality and Telexistence and Eurographics Symposium on Virtual Environments*. The Eurographics Association, 2016.

[9] Steve Cutchin and Yuan Li. View dependent tone mapping of hdr panoramas for head mounted displays. In Dirk Reiners, Daisuke Iwai, and Frank Steinicke, editors, *ICAT-EGVE 2016 - International Conference on Artificial Reality and Telexistence and Eurographics Symposium on Virtual Environments*. The Eurographics Association, 2016.

[10] Steve Cutchin and Iker Vazquez. *Synchronized Shared Scene Viewing in Mixed VR Devices in Support of Group Collaboration*, pages 348–352. Springer International Publishing, Cham, 2016.

[11] Steve Cutchin. Immersion idaho: An undergraduate research program for immersive virtual reality development. In *E-iED 2015: European Immersive Education Summit, Paris France*. Springer Verlag, 2015.

[12] Steve Cutchin. Immersion idaho: An undergraduate research project for immersive digital heritage collection. In *accepted, Digital Heritage International Conference*. IEEE, 2015.

[13] Neil G Smith, Steve Cutchin, Robert Kooima, Richard A Ainsworth, Daniel J Sandin, Jurgen Schulze, Andrew Prudhomme, Falko Kuester, Thomas E Levy, and Thomas A DeFanti. Cultural heritage omni-stereo panoramas for immersive cultural analyticsfrom the nile to the hijaz. In *Image and Signal Processing and Analysis (ISPA), 2013 8th International Symposium on*, pages 552–557. IEEE, 2013.

[14] Steve Smith, Steve Cutchin, Alyn Rockwood, Adel Saad, Neil G Smith, and Thomas E Levy. Demo paper: Virtual and immersive experience presentation of cultural heritage sites. In *Virtual Systems and Multimedia (VSMM), 2012 18th International Conference on*, pages 645–648. IEEE, 2012.

[15] Jens Schneider, Dina Garatly, Madhusudhanan Srinivasan, Stephen J Guy, Sean Curtis, Steven Cutchin, Dinesh Manocha, Ming C Lin, and Alyn Rockwood. Towards a digital makkah–using immersive 3d environments to train and prepare pilgrims. 2011.

[16] Todd Margolis, Thomas A DeFanti, Greg Dawe, Andrew Prudhomme, Jurgen P Schulze, and Steve Cutchin. Low cost heads-up virtual reality (huvr) with optical tracking and haptic feedback. In *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, volume 7864, page 41, 2011.

[17] A Chourasia, S Cutchin, A Decastro, and G Ely. Visualizing earthquake simulation data. volume 1, page 05, 2007.

[18] Philip Maechling and Thomas H Jordan. Visual insights into high-resolution earthquake simulations. 2007.

[19] Amit Chourasia and Jürgen P Schulze. Data centric transfer functions for high dynamic range volume data. Václav Skala-UNION Agency, 2007.

[20] A Chourasia and SM Cutchin. Visualization of large and small scale seismic data. volume 1, page 1307, 2006.

[21] J Minster, KB Olsen, R Moore, S Day, P Maechling, T Jordan, M Faerman, Y Cui, G Ely, Y Hu, et al. The scec terashake earthquake simulation. volume 1, page 05, 2004.

[22] C Bajaj, S Cutchin, C Morgia, Alberto Paoluzzi, and Valerio Pascucci. Web based collaborative caad. In *Proceedings of the fifth ACM symposium on Solid modeling and applications*, pages 326–327. ACM, 1999.

[23] C Bajaj, S Cutchin, and C Morgia. A., p., and pascucci, v.,(1999) web based collaborative caad.

[24] C Bajaj, C Baldazzi, S Cutchin, Alberto Paoluzzi, Valerio Pascucci, and Michele Vicentino. A programming approach for complex animations. part i. methodology. *Computer-Aided Design*, 31(11):695–710, 1999.

[25] C Bajaj, C Baldazzi, S Cutchin, A Paoluzzi, V Pascucci, and M Vicentino. Web-based approach for very complex animations through geometric programming. 1998.

[26] Chandrajit Bajaj, Steve Cutchin, et al. Web based collaboration-aware synthetic environments. pages 143–150. Citeseer, 1997.

[27] Noriyoshi Osumi, Mikio Shinya, Takeaki Mori, Takeshi Sunaga, C Bajaj, Steve Cutchin, and Raimund Merkert. Nls: Collaborative virtual environment to promote shared awareness. volume 96, pages 41–45.

[28] Chandrajit Bajaj and Steven Cutchin. Collaborative multimedia in shastra. volume 5, pages 365–366, 1995.

[29] Vinod Amipam, Chandrajit Bajaj, Steve Cutchin, Susan Evans, Insung Ikm, Jindon Chen, Andrew Royappa, Daniel Schikore, and Guoliang Xu. Scientific problem solving in a distributed and collaborative geometric environment1. page 72, 1993.

[30] Chandrajit L Bajaj and Steve Cutchin. The gati client/server animation toolkit. In *Communicating with virtual worlds*, pages 413–423. Springer Japan, 1993.

[31] Chendrejit L Bejej Steve Cutchin. The gati client/server animation tooll¡ it. Technical report, 1992.

[32] C Bajaj and S Cutchin. Interactive animation using gati. volume 93, 1992.

[33] V Anupam, C Bajaj, S Cutchin, T Dey, I Ihm, and S Klinkner. Shilp: Graphical creation, editing and display of algebraic surface models, 1989.

Dissertation

[34] Steven M Cutchin. *Flexible user interface coupling with operation transformation*. PhD thesis, 2000.