Tom Peterka
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Education and Training

- **Doctor of Philosophy** Computer Science Engineering. University of Illinois at Chicago (UIC), Chicago, IL. July, 2007. Dissertation: Dynallax: Dynamic Parallax Barrier Autostereoscopic Display.
- **Master of Science** Computer Science Engineering. University of Illinois at Chicago (UIC), Chicago, IL. December, 2003. Thesis: Scientific Visualization of N-Dimensional Attainable Regions.
- **Bachelor of Science** Computer Science Engineering. University of Illinois at Chicago (UIC), Chicago, IL. June, 1987.

Research and Professional Experience

- **Argonne National Laboratory** Argonne, IL, 2015 - present. Computer scientist.
- **Argonne National Laboratory** Argonne IL, 2010 - 2015. Assistant computer scientist.
- **Argonne National Laboratory** Argonne IL, 2007 - 2010. Postdoctoral appointee.
- **Northwestern University Argonne National Laboratory Institute of Science and Engineering** Evanston IL, 2014 - present. Fellow.
- **University of Chicago Computation Institute** Chicago IL, 2010 - present. Fellow.
- **University of Illinois at Chicago** Chicago IL, 2009 - present. Adjunct assistant professor.
- **Electronic Visualization Laboratory** Chicago IL. 2003 - 2007. Research assistant.
- **Illinois Advanced Design Inc.** Bridgeview IL. 1981 - 2007. Director.

Current Research

Design of highly-parallel HPC data analysis infrastructure and algorithms with applications in information-theoretic data analysis, parallel topological analysis, particle tracing, and computational geometry. Computational and experimental science applications of this research include cosmology, nuclear reactor design, synchrotron light source imaging, and superconductivity.

Selected Publications

- Peterka, T., Morozov, D., Phillips, C.: High-Performance Computation of Distributed-Memory Parallel 3D Voronoi and Delaunay Tessellation. Proceedings of SC14, New Orleans, LA, 2014.
- Lu, K., Shen, H.-W., Peterka, T.: Scalable Computation of Stream Surfaces on Large Scale Vector Fields. Proceedings of SC14, New Orleans, LA, 2014.
- Nouanesengsy, B., Lee, T.-Y., Lu, K., Shen, H.-W., Peterka, T.: Parallel Particle Advection and FTLE Computation for Time-Varying Flow Fields. Proeedings of SC12, Salt Lake, UT.
- Peterka, T., Ross, R.: Versatile Communication Algorithms for Data Analysis. 2012 EuroMPI Special Session on Improving MPI User and Developer Interaction IMUDI'12, Vienna, AT.

- Peterka, T., Ross, R., Kendall, W., Gyulassy, A., Pascucci, V., Shen, H.-W.: Scalable Parallel Building Blocks for Custom Data Analysis. Proceedings of LDAV'11, IEEE Visualization Conference, Providence RI, 2011.
- Moreland, K., Kendall, W., Peterka, T., Huang, J.: An Image Compositing Solution at Scale. Proceedings of SC11, Seattle WA, 2011.
- Kendall, W., Wang, J., Allen, M., Peterka, T., Huang, J., Erickson, D.: Simplified Parallel Domain Traversal. Proceedings of SC11, Seattle WA, 2011.
- Peterka, T., Goodell, D., Ross, R., Shen, H.-W., Thakur, R.: A Configurable Algorithm for Parallel Image-Compositing Applications. Proceedings of SC09, Portland OR, November 2009.
- Kendall, W., Glatter, M., Huang, J., Peterka, T., Latham, R., Ross, R.: Terascale Data Organization for Discovering Multivariate Climatic Trends. Proceedings of SC09, Portland OR, November 2009.
- Peterka, T., Yu, H., Ross, R., Ma, K.-L., and Latham, R: End-to-End Study of Parallel Volume Rendering on the IBM Blue Gene/P. Proceedings of ICPP'09 Conference, Vienna, Austria, September 2009.
- Peterka, T., Ross, R., Yu, H., Ma, K.-L., Kooima, R., and Girado, Javier: Autostereoscopic Display of Large-Scale Scientific Visualization. Proceedings of IS&T / SPIE SD&A XX Conference, San Jose CA, January 2009.
- Peterka, T., Kooima, R., Sandin, D., Johnson, A., Leigh, J., DeFanti, T.: Advances in the Dynallax Solid-State Dynamic Parallax Barrier Autostereoscopic Visualization Display System. IEEE Transactions on Visualization and Computer Graphics, Vol. 14, No. 3, p. 487-499, May/June 2008.
- Peterka, T., Yu, H., Ross, R., Ma, K.-L.: Parallel Volume Rendering on the IBM Blue Gene/P. Proceedings of Eurographics Symposium on Parallel Graphics and Visualization 2008 (EGPGV08) Crete, Greece, April 2008.
- Sandin, D., Margolis, T., Ge, J., Girado, J., Peterka, T., and DeFanti, T.: The Varrier TM Autostereoscopic Virtual Reality Display. ACM Transactions on Graphics, Proceedings of ACM SIGGRAPH 2005 24, no. 3: 894-903, 2005.

Synergistic Activities

- **Award Recognitions:** Gordon Bell Finalist (S. Habib lead author) SC13 and SC12, Best Poster LDAV'13 (Abon Chaudhuri lead author), Best Student Paper (W. Kendall lead author) SC11, Best Paper, Eurographics Parallel Graphics and Visualization Symposium, 2008, Best Paper, IEEE Virtual Reality Conference, 2007, University Fellowship, University of Illinois at Chicago, 2006
- **Education and Outreach:** Member IEEE, Founding member Postdoctoral Society of Argonne, 2008, Assisted organization of Scientific Data Analysis and Visualization for Petascale Computing Workshop, 2008-2012., Technical program committee member SC12, SC13, EGPGV'13, UltraVis'13, ICPP'14, Sponsor summer interns at Argonne National Laboratory, 2008-present, MCS mentoring coordinator 2013-present.
- **Research Collaborations:** DOE SciDAC SDAV Institute, DOE SciDAC Cosmic Frontiers, DOE CESAR Codesign Center, DOE SciDAC Institute for Ultrascale Visualization, DOE SciDAC-E Energy Frontiers Research Centers, University of Chicago Computation Institute, University of Illinois Electronic Visualization Laboratory, University of Utah SCI Institute, Northwestern University.