KRISTIN CARRIE POTTER, Ph.D.

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PROFESSIONAL EXPERIENCE

Research Computer Scientist, Scientific Computing and Imaging Institute,
University of Utah, Apr. 2011-present
Post-Doctoral Fellow, Scientific Computing and Imaging Institute,
University of Utah, Dec. 2009-Apr. 2011
Research Assistant, Scientific Computing and Imaging Institute,
University of Utah, Jan. 2008-Dec. 2009
Graduate Intern, Data Analysis and Visualization Dept.,
Sandia National Laboratories, NM, Jun. 2008-Sep. 2008
Research Assistant, Geometric Design and Computation Research Group,
University of Utah, Aug. 2000-Dec. 2007
Teaching Assistant, School of Computing,
University of Utah, August 2001 - December 2004, Spring 2006, Fall 2007
Leader, Undergraduate Research Team, Department of Computer Science,
University of Utah, Summer 2001

EDUCATION

Ph.D., University of Utah, August 2010.
Advisor: Richard Riesenfeld. *The Visualization of Uncertainty.*
M.S., University of Utah, May 2003.
Advisor: Richard Riesenfeld. *3D Line Textures for NPR Walkthroughs.*
B.S., University of Oregon, May 2000.
Computer Science, Fine Arts. Art History (minor)

RESEARCH INTERESTS

I am currently researching methods for uncertainty visualization through combining scientific and information visualization. This work includes researching statistical measures of uncertainty, error, and confidence levels, and translating the semantic meaning of these measures into visual metaphors. In addition, the statistics used to describe the uncertainty of a data set can be used to summarize large datasets, lending this work to the analysis and display of large-scale datasets. Other research interests include computer graphics, non-photorealistic and artistic rendering.

PUBLICATIONS

Journals

(1) **Visualization of Uncertainty Without a Mean.** *Kristin Potter*, Samuel Gerber, and Erik W. Anderson. IEEE Computer Graphics and Applications, vol. 33, no. 1, pp. 75–79, 2013.

(2) **Uncertainty in the Development and Use of Equation of State Models.** V.Gregory Weirs, Nathan Fabian, *Kristin Potter*, Laura McNamara, and Thomas Otahal. International Journal for Uncertainty Quantification, vol. 3, no. 3, pp. 255-270, 2012.

(3) **Data Analysis with the Morse-Smale Complex: The msr Package for R.** Samuel Gerber, and *Kristin Potter*. Journal of Statistical Software, vol. 50, no. 2, pp. 1–22, 2012.

(4) **Interactive Visualization of Probability and Cumulative Density Functions.** *Kristin Potter*, Robert M. Kirby, Dong Bin Xiu, and Chris R. Johnson. International Journal of Uncertainty Quantification, vol. 2, no. 4, pp. 397-412, 2012.

(5) **A User Study of Visualization Effectiveness Using EEG and Cognitive Load.** Erik W. Anderson, *Kristin Potter*, Laura E. Matzen, Jason F. Shepherd, Gilbert A. Preston, and Claudio T. Silva. Computer Graphics Forum, vol. 30, no. 3, pp. 791–800, 2011. (Best Paper Runner-Up).

(6) **Visualizing Summary Statistics and Uncertainty.** *Kristin Potter*, Joe Kniss, Richard Riesenfeld, and Chris R. Johnson. Computer Graphics Forum (Proceedings of EuroVis 2010), vol. 29, no. 3, pp. 823–831, 2010.

(7) **Visualization of Uncertainty and Ensemble Data: Exploration of Climate Modeling and Weather Forecast Data with Integrated ViSUS-CDAT Systems.** *Kristin Potter*, Andrew Wilson, Peer-Timo Bremer, Dean Williams, Charles Doutriaux, Valerio Pascucci, and Chris R. Johhson. In *Proceedings of SciDAC 2009*, Journal of Physics: Conference Series, vol. 180, no. 012089, pp. (published online), 2009.

(8) **Occam's Razor and Petascale Visual Data Analysis.** E.W. Bethel, C.R. Johnson, S. Ahern, J. Bell, P.-T. Bremer, H. Childs, E. Cormier-Michel, M. Day, E. Deines, P.T. Fogal, C. Garth, C.G.R. Geddes, H. Hagen, B. Hamann, C.D. Hansen, J. Jacobsen, K.I. Joy, J. Krueger, J. Meredith, P. Messmer, G. Ostrouchov, V. Pascucci, *K. Potter*, Prabhat, D. Pugmire, O. Ruebel, A.R. Sanderson, C.T. Silva, D. Ushizima, G.H. Weber, B. Whitlock, and K. Wu. In *Proceedings of SciDAC 2009*, Journal of Physics: Conference Series, vol. 180, no. 012084, pp. (published online), 2009.

(9) **Resolution Independent NPR-Style 3D Line Textures.** *Kristin Potter*, Amy Gooch, Bruce Gooch, Peter Willemsen, Joe Kniss, Richard Riesenfeld, and Peter Shirley. Computer Graphics Forum, vol. 28, no. 1, pp. 52–62, 2009.

(10) **Interactive Visualization for Memory Reference Traces.** A.N.M. Imroz Choudhury, *Kristin Potter*, and Steven Parker. Computer Graphics Forum, vol. 27, no. 3, pp. 815-822, 2008.

(11) **IStar: A Raster Representation for Scalable Image and Volume Data.** Joe Kniss, Warren Hunt, *Kristin Potter*, and Pradeep Sen. IEEE Transactions on Visualization and Computer Graphics, vol. 13, no. 6, pp. 1424–1431, 2007.

(12) **Ray Bilinear Patch Intersections.** Shaun Ramsey, *Kristin Potter*, and Charles Hansen. Journal of Graphics Tools, vol. 9, no. 3, pp. 41–47, 2004.

Refereed Conference Proceedings

(1) **Visualization for Understanding Uncertainty in the Simulation of Myocardial Ischemia.** Paul Rosen, Brett Burton, *Kristin Potter*, and Chris R. Johnson. In *3rd International Workshop on Visualization in Medicine and Life Sciences 2013 (VMLS 2013)*, pp. (to appear), 2013.

(2) **Ensemble-Vis: A Framework for the Statistical Visualization of Ensemble Data.** *Kristin Potter*, Andrew Wilson, Peer-Timo Bremer, Dean Williams, Charles Doutriaux, Valerio Pascucci, and Chris R. Johhson. In *IEEE Workshop on Knowledge Discovery from Climate Data: Prediction, Extremes*, pp. 233–240, 2009.

(3) **Toward Visual Analysis of Ensemble Data Sets.** Andrew T. Wilson, and Kristin C. Potter. In *Proceedings of the 2009 Workshop on Ultrascale Visualization (UltraVis '09)*, pp. 48–53, 2009.

(4) **Towards the Visualization of Multi-Dimentional Stochastic Distribution Data.** *Kristin Potter*, Jens Krueger, and Chris R. Johnson. In *Proceedings of IADIS Computer Graphics and Visualization (CGV 2008)*, pp. 191–196, 2008.

(5) **Unified Volume Format: A General System For Efficient Handling Of Large Volumetric Datasets.** Jens Krüger, *Kristin Potter*, Robert MacLeod, and Chris R. Johnson. In *Proceedings of IADIS Computer Graphics and Visualization (CGV 2008)*, pp. 19–26, 2008.

(6) **Methods for Presenting Statistical Information: The Box Plot.** Kristin Potter. In *Visualization of Large and Unstructured Data Sets*, GI-Edition Lecture Notes in Informatics (LNI), Hans Hagen, Andreas Kerren, and Peter Dannenmann (eds). vol. S-4, pp. 97–106, 2006.

(7) **Haptically Guided Filtering for Reverse Engineering.** *Kristin Potter*, David Johnson, and Elaine Cohen. In *Proceedings of the International Design Engineering Technical Conference*, pp. 1071–1076, 2004.

(8) **Height Field Haptics.** *Kristin Potter*, David Johnson, and Elaine Cohen. In *Proceedings of the 12th International Symposium on Haptics*, pp. 258–265, 2004.

Refereed Abstracts and Posters

(1) **Uncertainty Visualization Prototypes for Materials Modeling.** *Kristin Potter*, Thomas Otahal, Nathan Fabian, V.Gregory Weirs, and Laura McNamara. In *Working with Uncertainy Workshop*, 2011.

(2) **Visualizing Global Correlation in Large-Scale Molecular Biological Data.** A.N.M. Choudhury, *Kristin Potter*, Theresa-Marie Rhyne, Yarden Livnat, Chris Johnson, and Orly Alter. In *IEEE Symposium on Biological Data Visualization*, 2011.

Unrefereed Publications

(1) **From Quantification to Visualization: A Taxonomy of Uncertainty Visualization Approaches.** *Kristin Potter*, Paul Rosen, and Chris R. Johnson. IFIP Advances in Information and Communication Technology Series,Andrew Dienstfrey, and Ronald Boisvert (eds). pp. (To Appear), 2012. (Invited Paper).

(2) **The Visualization of Uncertainty.** Kristin Potter. 2010.

(3) **3D Line Textures and the Visualization of Confidence in Architecture.** *Kristin Potter*, Amy Gooch, Bruce Gooch, Peter Willemsen, Joe Kniss, Richard Riesenfeld, and Peter Shirley. no. UUCS-07-005, 2007.

(4) **Visual Summary Statistics.** *Kristin Potter*, Joe Kniss, and Richard Riesenfeld. no. UUCS-07-004, 2007.

(5) **3D Line Textures for NPR Walkthroughs.** Kristin Potter. 2003.

AWARDS

Best Paper Runner-Up, EuroVis 2011
A User Study of Visualization Effectiveness Using EEG and Cognitive Load.

INVITED TALKS

Ensemble Visualization
★ *DOE Computer Graphics Forum*
Albuquerque, NM, April 23-26, 2012.
Uncertainty Visualization:Beyond Mean and Standard Deviation
★ *IAMCS-KAUST Workshop on Computational Biomedicine and Geophysics*
Salt Lake City, UT, April 5-6, 2012.
Visualization of Ensembles and Uncertainty
★ *IAMCS Workshop:Visualization in Biomedical Computation*
College Station, TX, February 23, 2011.
Uncertainty Visualization: State of the Art
★ *USA/South America Symposium on Stochastic Modeling and Uncertanity Quantification*
Leblon Beach, Rio de Janeiro, Brazil, August 1-5, 2011.
★ *Modeling Data with Uncertainty Seminar*
School of Computing, Salt Lake City, UT, November 3, 2010.
The Visualization of Uncertainty
★ *IAMCS-KAUST Seminar Series*
TAMU Campus, College Station, TX, May 15, 2010.
★ *IAMCS Annual Spring Symposium*
KAUST Campus, Jeddah, Saudi Arabia, May 27-29, 2010.
Open Questions in Uncertainty Visualization
★ *CScADS Workshop on Scientific Data Analysis and Visualization for Petascale Computing*
Snowbird, UT, July 26-29, 2010.
Visualization of Statistical Measures of Uncertainty.
★ *IEEE Vis 2007 Doctoral Colloquim*
Sacremento, CA, October 31, 2007.
Visual Summary Statistics
★ *First Workshop of the DFG's International Research Training Group Visualization of Large and Unstructured Data Sets*
Dagstuhl Castle, Germany, June 14-16, 2006.

TEACHING

Guest Lectures
Color
Introduction to Visualization (cs 5630/6630) , School of Computing, University of Utah, 2012.
Statistical Uncertainty: From Quantification to Visualization
Introduction to Visualization (cs 5630/6630) , School of Computing, University of Utah, 2012.
Uncertainty Visualization
Introduction to Scientific Computing (cs 3200) , School of Computing, University of Utah, 2013.

TUTORIALS

Uncertainty and Parameter Space Analysis in Visualization
IEEE Visualization, VisWeek 2012, Seattle, WA, Oct 15, 2012, with Alex T. Pang, Christoph Heinzl, Eduard Groller, Hans-Christian Hege, Rudiger Westermann, Stefan Bruckner, and Torsten Moller.

PANELS

You Should be Using...TCLAP: Templatized C++ Command Line Parser Library
DOE Computer Graphics Forum Panel, Park City, UT, April 11-14, 2010, with Hank Childs, Randall Hand, David Thompson, Allen Sanderson, Sean Ziegeler, and Bill Sherman.

SOFTWARE

Morse-Smale Visualization and Regression: R package msr
http://cran.r-project.org/web/packages/msr/.
ProbVis: Visualization and Exploration Tool for Probability Distribution Functions
http://www.sci.utah.edu/ kpotter/software/ProbVis/.

PROFESSIONAL ACTIVITIES

Student Committee
Joshua Anghel, MS Committee, Boise State University, Expected Spring 2012.

Organizer

2012 IAMCS-KAUST Workshop on Computational Biomedicine and Geophysics
Salt Lake City, Utah, April 5th-6th, 2012.

Program Committee

Working with Uncertainty Workshop
IEEE VisWeek 2011, Providence, Rhode Island, October 24, 2012.

Session Chair

Working with Uncertainty Workshop
Co-Located with VisWeek 2011, Providence, RI, October 24, 2011.

USA/South America Symposium on Stochastic Modeling and Uncertanity Quantification
Leblon Beach, Rio de Janeiro, Brazil, August 1-5, 2011.

Participant

USA/South America Symposium on Stochastic Modeling and Uncertanity Quantification
Leblon Beach, Rio de Janeiro, Brazil, August 1-5, 2011.

IAMCS Annual Spring Symposium
KAUST Campus, Jeddah, Saudi Arabia, May 27-29, 2010.

IEEE Visualization Ph.D. Colloquium
Sacramento, CA, October. 29, 2007.

First Annual IRTG Workshop
Schloss Dagstuhl, Germany, June 14, 2006.

Member

Systers Pass-It-On Grants Review Committee
Anita Borg Institure for Women and Technology, Chair: 2011-present, Member: 2008-present.

Women @ CS Group
School of Computing, University of Utah, Dec 2005-2008.

Graduate Student Advisory Committee
School of Computing, University of Utah, Chair, 2002-2003. Member, 2001-2002..

Reviewer

IEEE Visualization, 2007, 2008, 2009, 2010, 2011, 2012, 2013.
IEEE Visualization Posters, 2012.
EuroVis, 2008, 2010, 2011, 2012, 2013.
EuroVis Short Papers, 2012.
IEEE InfoVis, 2007, 2011.
IEEE TVCG, 2011, 2012, 2013.
Intl Journal for Uncertainty Quantification, 2011.
Journal of Zhejiang University Science, 2012.
ACM Siggraph Technical Sketches, 2005, 2006.
IEEE Computer Graphics & Applications, 2013.
American Statistician, 2007.
Computer Graphics Forum, 2008.
IEEE VAST, 2007.