

3076 Stratus Drive, West Lafayette, IN 47906, (765) 463 0672

Department of Computer Science  
University of Illinois, Urbana-Champaign  
Siebel Center for Computer Science  
201 North Goodwin Ave.  
Urbana, IL 61801-2302  
Web-page: [graphics.cs.uiuc.edu/~ptb/](http://graphics.cs.uiuc.edu/~ptb/)  
E-mail: [ptbremer@acm.org](mailto:ptbremer@acm.org)

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## EDUCATION

- 10/00 - 12/04 **Ph.D.**, Dept. of Computer Science, University of California, Davis  
**Major:** Computer Graphics  
**Minor:** Mathematics  
**Advisor:** Prof. Bernd Hamann  
**Committee:** K.I. Joy (Chair), B. Hamann, J. Hass (all UC Davis), V. Pascucci (LLNL), H. Edelsbrunner (Duke University)
- 9/97 - 4/00 **Diploma (M.S.)** University of Hannover, Germany  
**Major:** Mathematics  
**Second Major:** Computer Science  
**Minor:** Neuro Anatomy  
**Advisor:** Prof. Franz Erich Wolter
- 10/95 - 9/97 **Pre-Diploma (B.S.)** University of Hannover, Germany  
**Major:** Mathematics  
**Second Major:** Computer Science

## PROFESSIONAL EXPERIENCE

### Current Employment

09/04 - Postdoctoral research associate, Department of Computer Science, University of Illinois, Urbana-Champaign

### Research Fellow

08/02 - 08/04 Student employee graduate research fellow, Lawrence Livermore National Laboratory

### Research Assistant

08/01 - 08/02 Research assistant, Department of Computer Science, University of California, Davis

**Summer Internship**

06/01 - 08/01 Summer internship Lawrence Livermore National Laboratory

**Teaching assistant**

09/00 - 06/01 ECS30 Introduction into Problem Solving, Department of Computer Science, University of California, Davis

04/99 - 7/99 Co-Advisor for Practicum in Computer Science. Department of Mathematics and Computer Science, University of Hannover

9/98 - 2/99 Computer Science I. Department of Mathematics and Computer Science, University of Hannover

4/98 - 7/98 Algorithms and Data Structures for Engineers. Department of Mathematics and Computer Science, University of Hannover

**RESEARCH INTERESTS**

Visualization, Data Analysis, Topological Methods, Meshing, Moving-Least-Squares (MLS) surfaces, Medical Imaging, Volume Modeling, Virtual Reality

Recent research in topological based multi-resolution hierarchies, all quadrilateral surface remeshing, and sampling conditions of moving-least-squares surfaces

**PROFESSIONAL MEMBERSHIPS**

Association for Computing Machinery (ACM)

Institute of Electrical and Electronics Engineers (IEEE)

**COMPUTER SKILLS**

**Programming languages** C++, C, Scheme, Prolog, ML

**Operating systems** Unix, Linux, MAC OS, Windows

**AWARDS AND TITLES**

- 2002 Accepted into the Student Employee Graduate Research Fellowship program of the Lawrence Livermore National Laboratory
- 1998 Award for outstanding academic achievement including 1000DM (500\$) reward
- Winner of German University Championship, swimming, 400m freestyle relay, 1997
- Numerous swimming titles including German state championship titles and a fourth place in the German Junior National Championships
- Finalist 200m freestyle MAC (Mid-American-Conference) Championship 1995

## INVITED TALKS

- Analyzing Topology in Practice. TopoInVis 2005: Workshop on Topology-Based Methods in Visualization, Sep.29-20, 2005, Budmerice, Slovakia.
- Quadrangulating a Mesh Using Laplacian Eigenvectors. Dagstuhl seminar 05231 “Scientific Visualization: Challenges for the Future” June 5-10 2005, Wadern, Germany.
- Topological Hierarchies with Minimal Error, BIRS Workshop on Mathematical Foundations of Scientific Visualization, Computer Graphics, and Massive Data Exploration, May 22-27, 2004, Banff, Canada
- A Multi-resolution Data Structure for Two-dimensional Morse-Smale Functions. Dagstuhl seminar 03271 “Hierarchical Methods in Computer Graphics”, June 29-July 4, 2003, Wadern, Germany.

## PANELS

- What are the most demanding and critical problems, and what are the most promising research directions in Flow-Topo-Vis. TopoInVis 2005: Workshop on Topology-Based Methods in Visualization, Sep.29-20, Budmerice, Slovakia.

## PUBLICATIONS

- [1] A. Gyulassy, V. Natarajan, V. Pascucci, P.-T. Bremer, and B. Hamann. Topology-based simplification for feature extraction from 3D scalar fields. *IEEE Transactions on Computer Graphics and Visualization (TVCG)*, 2006. to appear.
- [2] P.-T. Bremer and V. Pascucci. A practical approach to two-dimensional scalar topology. In H. Hauser, H. Theisel, and H. Hagen, editors, *To be announced*, page to appear. 2005.
- [3] V. Natarajan, Y. Wang, P.-T. Bremer, V. Pascucci, and B. Hamann. Segmenting molecular surfaces. *Computer Aided Geometric Design*, to appear, 2005.
- [4] A. Gyulassy, V. Natarajan, V. Pascucci, P.-T. Bremer, and B. Hamann. Topology-based simplification for feature extraction from 3D scalar fields. In *Proceedings of the IEEE Visualization 2005 (VIS'05)*, pages 535–542. IEEE Computer Society, 2005.

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- [5] S. Dong, P.-T. Bremer, M. Garland, V. Pascucci, and J. C. Hart. Quadrangulating a mesh using Laplacian eigenvectors. Technical Report UIUCDCS-R-2005-2583, University of Illinois, Urbana-Champaign, June 2005.
- [6] P.-T. Bremer and J. C. Hart. A sampling theorem for MLS surfaces. In M. Pauly, M. Zwicker, M. Alexa, and S. Rusinkiewicz, editors, *Proceedings of the Symposium on Point-Based Graphics 2005*, pages 47–54. Eurographics Association, 2005.
- [7] P.-T. Bremer, V. Pascucci, and B. Hamann. Maximizing adaptivity in hierarchical topological models. In *Proceedings of the International Conference on Shape Modeling and Applications 2005 (SMI '05)*, pages 298–307. IEEE Computer Society, 2005.
- [8] P.-T. Bremer, V. Pascucci, and B. Hamann. Maximizing adaptivity in hierarchical topological models using cancellation trees. In T. Moeller, B. Hamann, and B. Russell, editors, *Mathematical Foundations of Scientific Visualization, Computer Graphics, and Massive Data Exploration*, page to appear. Springer, 2006.
- [9] P.-T. Bremer, H. Edelsbrunner, B. Hamann, and V. Pascucci. A topological hierarchy for functions on triangulated surfaces. *IEEE Trans. on Visualization and Computer Graphics*, 10(4):385–396, 2004.
- [10] P.-T. Bremer. *Topology-based Multi-resolution Hierarchies*. PhD thesis, University of California, Davis, Davis, CA, 2004.
- [11] P.-T. Bremer, H. Edelsbrunner, B. Hamann, and V. Pascucci. A multi-resolution data structure for two-dimensional Morse-Smale functions. In G. Turk, J. J. van Wijk, and R. Moorhead, editors, *Proc. IEEE Visualization '03*, pages 139–146, Los Alamitos California, 2003. IEEE, IEEE Computer Society Press.
- [12] P.-T. Bremer, S. Porumbescu, K. I. Joy, and B. Hamann. Automatic semi-regular mesh construction from adaptive distance fields. In T. Lyche and M.-L. Mazure L. L. Schumaker, editors, *Curve and Surface Design: Saint Malo 2002*, pages 11–21, Nashville, TN, 2003. Vanderbilt University Press.
- [13] P.-T. Bremer, S. Porumbescu, F. Kuester, B. Hamann, K. I. Joy, and K.-L. Ma. Virtual clay modeling using adaptive distance fields. In *Proceedings of the 2002 International Conference on Imaging Science, Systems, and Technology (CISST 2002)*, volume 1, 2002.

- [14] P.-T. Bremer, B. Hamann, O. Kreylos, and F.-E. Wolter. Simplification of closed triangulated surfaces using simulated annealing. In T. Lyche and L. L. Schumaker, editors, *Mathematical Methods in CAGD: Oslo 2000*, pages 45–54, Nashville, TN, 2001. Vanderbilt University Press.
- [15] P.-T. Bremer, O. Kreylos, and B. Hamann. A data-dependent gradient quantization scheme for the acceleration of volume rendering. In *Visual Data Exploration and Analysis VIII*, volume 4302, pages 69–79. SPIE, 2001.
- [16] P.-T. Bremer. Boundary simplification of a triangulated body. Master's thesis, University of Hannover, Hannover, Germany, 2000.