

Curriculum Vitae

Date of Birth: June 2nd, 1980

Citizenship: Austrian

Languages: German (native), English (fluent)

Dipl.-Ing. Dr.techn. Stefan Bruckner

Institute of Computer Graphics and Algorithms

Vienna University of Technology, Austria

<http://www.cg.tuwien.ac.at/staff/StefanBruckner.html>

Research

My research interests lie in the field of visualization. I investigate methods for gaining insight into complex data to further scientific understanding and discovery, medical diagnosis and treatment, and engineering, as well as techniques for communicating these findings to the public. Building on these foundations, my current interests include the development of novel approaches for the scientific inquiry of large-scale heterogeneous data spaces with a particular focus on the visual analysis of spatial data.

Career Achievements

- Several awards and recognitions including the *Eurographics Young Researcher Award 2011*, the *EuroVis 2010 Best Paper Award*, and the *Karl-Heinz-Höhne Award for Medical Visualization 2006*
- Co-organizer of and contributor to a successful tutorial series on illustrative visualization at major international conferences (ACM SIGGRAPH, IEEE Visualization, Eurographics)
- Main developer of the VolumeShop framework, a rapid-prototyping toolkit for visualization research and teaching now used by several external institutions such as the University of Bergen, Norway; Christian Michelsen Research, Norway; and the VRVis Research Center, Austria
- Co-author of 39 papers (15 as first author) published in journals and at peer-reviewed international conferences – total citation count of 790 (H-index: 15) [Source: Hazing's Publish or Perish]
- Paper co-chair of EuroVis 2012 – EuroVis is the largest European conference on visualization

Education

Jul. 2004 – Apr. 2008: *Doctoral Studies (Computer Science)*. Vienna University of Technology, Austria. Dissertation: *Interactive Illustrative Volume Visualization*. Advisor: Prof. E. Gröller, Institute of Computer Graphics and Algorithms. External Reviewer: Prof. D. S. Ebert, Purdue University. **Graduation with highest distinction.**

Oct. 1999 – Jun. 2004: *Master's Studies (Computer Science)*. Vienna University of Technology, Austria. Master's Thesis: *Efficient Volume Visualization of Large Medical Datasets*. Advisors: Dr. S. Grimm, Prof. E. Gröller, Institute of Computer Graphics and Algorithms. **Graduation with highest distinction.**

Sep. 1994 – Jun. 1999: *Technical Secondary School (Computing and Organization)*. Federal Higher Technical Institute Pinkafeld, Austria. Final Project: *Hierarchical Data Interface for Geodesy-Software*. **Graduation with highest distinction.**

Employment History

Jul. 2009 – Jun. 2010: *Postdoctoral Research Fellow*. Simon Fraser University, Canada. Guest researcher (funded by the Natural Science and Engineering Research Council of Canada) at the Graphics, Usability, and Visualization lab.

since Aug. 2008: *Assistant Professor*. Vienna University of Technology, Austria. Senior researcher and lecturer at the Institute of Computer Graphics and Algorithms.

Nov. 2005 – Jan. 2006: *Consultant*. Biotronics3D Ltd., London, United Kingdom. Design and implementation consulting for a high performance virtual endoscopy rendering system.

Jul. 2004 – Jul. 2008: *Research Assistant*. Vienna University of Technology, Austria. Research and teaching at the Institute of Computer Graphics and Algorithms.

Oct. 2003 – Jun. 2004: *Teaching Assistant*. Vienna University of Technology, Austria. Supervision of student courses at the Institute of Computer Graphics and Algorithms.

Summer 2001: *Intern.* UPC Telekabel GmbH, Vienna, Austria. Migration of high-throughput database applications and interface design.

Summer 2000: *Intern.* Efficient Marketing GmbH, Vienna, Austria. Design and development of a web-based front-end for data-warehousing applications.

Summer 1999: *Intern.* rmDATA GmbH, Oberwart, Austria. Development of an interactive editor for measurement data using an object-oriented database interface.

Summer 1998: *Intern.* rmDATA GmbH, Oberwart, Austria. Development of a printing system for measurement data.

Professional Activities

Paper Chair: EuroVis 2012 (with S. Miksch and H. Pfister)

Committee Member: IEEE Visualization (2009, 2011, 2012), EuroVis (2009, 2010, 2011), Eurographics (2012), IEEE Pacific Visualization (2011, 2012), Eurographics Workshop on Visual Computing for Biology and Medicine (2012), IEEE Symposium on Biological Data Visualization (2012), International Symposium on Visual Computing (2011, 2012), Computational Aesthetics (2010, 2011, 2012), International Conference on Computer Graphics Theory and Applications (2012), International Conference on Advances in Computer Entertainment Technology (2011), Knowledge-Assisted Visualization (2008)

Journal Referee: IEEE Transactions on Visualization and Computer Graphics, IEEE Transactions on Biomedical Engineering, IEEE Computer Graphics and Applications, Computer Graphics Forum, Computers & Graphics, The Visual Computer, IEEE Transactions on Applied Perception, International Journal of Creative Interfaces and Computer Graphics

Conference Reviewer: ACM SIGGRAPH, ACM SIGGRAPH Asia, IEEE Visualization, Eurographics, EuroVis, IEEE Pacific Visualization, Pacific Graphics, IEEE Virtual Reality, Graphics Interface, Volume Graphics, Vision, Modeling, and Visualization, Computer Graphics International, Computational Aesthetics, Computer Graphics, Imaging and Visualization, Simulation und Visualisierung, Winter School of Computer Graphics

Grant Proposal Reviewer: Netherlands Organisation for Scientific Research (NWO)

Memberships: ACM SIGGRAPH, Eurographics, IEEE Computer Society

Prizes and Awards

Eurographics Young Researcher Award 2011. Apr. 2011. Llandudno, United Kingdom.

EuroVis Best Paper Award 2010. Jun. 2010. Bordeaux, France.

Eurographics 3rd Best Paper Award 2007. Sep. 2007. Prague, Czech Republic.

Karl-Heinz Höhne Award for Medical Visualization 2006. Mar. 2006. Magdeburg, Germany.

CESCG Best Paper & Best Presentation Award 2004. Apr. 2004. Budmerice, Slovakia.

Additional Qualifications

Quality Techniques QII Certificate. Austrian Society for Quality Assurance. Dec. 1998. Vienna, Austria.

Cambridge First Certificate in English. Grade A Exam. Jun. 1997. Vienna, Austria.

Projects

since 2010: *ViMaL – The Visualization Mapping Language.* Co-principal investigator. Austrian Science Fund (FWF) project no. P21695-N23 (3 years, € 344.946).

since 2009: *Natural Fetoscopic Rendering.* Co-principal investigator. Company-funded research project with GE Healthcare (2 years, € 160.679, recently extended for two more years).

2006 – 2008: *DiagVis – Diagnostic Visualization for Medical Applications.* Co-principal investigator. Company-funded research project with AGFA HealthCare (2 years, € 180.000).

2005 – 2008: *ExVisation – Expressive Visualization of Volumetric Data.* Co-investigator. Austrian Science Fund (FWF) project no. P18322-N04 (3 years, € 213.769)

Patents

- S. Bruckner**, V. Šoltészová, K. Bühler, J. Hladůvka. *Visual Queries in Data Exploration*. International Patent Application PCT/AT2009/000381 (filed 2009-10-02).
- A. Kanitsar, P. Kohlmann, **S. Bruckner**, M. E. Gröller, R. Wegenkittl, and L. Mroz. *Method and Apparatus for Determining Medical Image Position*. European Patent EP2192553 (filed 2008-11-28, **granted 2011-11-28**), United States Patent Application US12/625771 (filed 2009-11-25).
- A. Kanitsar, M. Haidacher, **S. Bruckner**, and M. E. Gröller. *Method and Apparatus for Multimodal Visualization of Volume Data Sets*. European Patent Application EP08160164.3 (filed 2008-07-11), International Patent Application PCT/EP2009/057664 (filed 2009-06-19).
- A. Kanitsar, P. Kohlmann, **S. Bruckner**, M. E. Göller, R. Wegenkittl, and L. Mroz. *Method and Apparatus for Volume Rendering of Medical Data Sets*. European Patent EP2048621 (filed 2007-10-09, **granted 2010-03-04**), United States Patent Application US12/134615 (filed 2008-06-06), International Patent Application PCT/EP2008/063526 (filed 2008-10-09).

Invited Talks

- Visual Knowledge Discovery in Neurobiology*. Dagstuhl Seminar on Scientific Visualization. Jun. 2011. Dagstuhl, Germany.
- Navigating in Volumetric Data Spaces*. Joint National Ph.D. Conference in Medical Imaging. Jan. 2011. Bergen, Norway.
- Visualization of Volumetric Data Spaces*. Zuse-Institute Berlin. Sep. 2010. Berlin, Germany.
- Interactive Volume Visualization for Illustration, Medicine, and Biology*. Jul. 2009. Simon Fraser University. Burnaby, Canada.
- Interactive Visualization Techniques for Illustrative Depiction*. IllustraVis Workshop. Jun. 2009. University of Bergen, Norway.
- Introduction to VolumeShop*. Christian-Michelson Research. Feb. 2009. Bergen, Norway.
- Interactive Illustrative Volume Visualization*. University of Bergen. Feb. 2009. Bergen, Norway.
- Interactive Illustrative Volume Visualization*. University of Münster. Oct. 2008. Münster, Germany.
- Abstraction in Illustrative Visualization*. University of Girona. Sep. 2008. Girona, Spain.
- Interactive Illustrative Volume Visualization Techniques for Exploration and Communication*. Purdue University. Nov. 2006. West Lafayette, United States.
- VolumeShop: Interactive Direct Volume Illustration*. CT-Day Workshop. Sep. 2006. Wels, Austria.
- A System for Illustrative Volume Visualization*. Dagsuhl Seminar on Computational Aesthetics in Graphics, Visualization and Imaging. May 2006. Dagstuhl, Germany.
- Applications of Illustrative Volume Visualization Techniques*. Otto-von-Guericke-University. Nov. 2005. Magdeburg, Germany.
- Abstraction Techniques for Interactive Illustration*. Dagstuhl Seminar on Scientific Visualization: Challenges for the Future. May 2005. Dagstuhl, Germany.

Reviewed Tutorials

- Interactive Tools for Scientific and Medical Illustration Composition*. Eurographics 2008 Tutorial. Apr. 2008. Crete, Greece.
- Illustrative Display and Interaction in Visualization*. IEEE Visualization 2007 Tutorial. Oct. 2007. Sacramento, United States.
- Illustrative Visualization for Science and Medicine*. IEEE Visualization 2006 Tutorial. Oct. 2006. Baltimore, United States.
- Illustrative Visualization for Medicine and Science*. ACM SIGGRAPH 2006 Course. Aug. 2006. Boston, United States.

External Lecturing

- Image Synthesis*. Four Guest Lectures. Simon Fraser University. Nov. 2009. Burnaby, Canada.
- Introduction to Scientific Visualization*. Guest Lecture. University of British Columbia. Nov. 2009. Vancouver, Canada.
- VolumeShop 101*. Guest Lecture. University of Bergen. Feb. 2009. Bergen, Norway.

Introduction to Volume Rendering. Guest Lecture. University of Girona. Sep. 2008. Girona, Spain.

Teaching

Real-Time Visualization. 186.191 VU (Lecture with Exercises), 3.0 ECTS. Since Summer Semester 2011.
Computational Aesthetics. 186.163 VU (Lecture with Exercises), 3.0 ECTS. Since Winter Semester 2006.
 Research Seminar on Computer Graphics and Digital Image Processing. 186.117 SE (Seminar), 4.0 ECTS. Winter Semester 2005.
Computer Graphics 2. 186.197 VO (Lecture), 3.0 ECTS. Oral exams (multiple dates per semester) since Winter Semester 2004.

Student Supervision

Martin Haidacher. *Information-based Feature Enhancement in Scientific Visualization*. PhD Thesis. Vienna University of Technology, Austria, 2011.
 Peter Kohlmann. *LiveSync: Smart Linking of 2D and 3D Views in Medical Applications*. PhD Thesis. Vienna University of Technology, Austria, 2009.
 Peter Rautek. *Semantic Visualization Mapping for Volume Illustration*. PhD Thesis. Vienna University of Technology, Austria, 2009.
 Veronika Šoltészová. *Visual Queries in Neuronal Data Exploration*. Master's Thesis. Vienna University of Technology, Austria, 2009.
 Nicolas Pühringer. *Sketch-based Modeling for Volume Visualization*. Master's Thesis. Vienna University of Technology, Austria, 2009.
 Yngve Hammerland. *Visualization and Interaction with Medical Data in Immersive Environments*. External Master's Examiner. University of Bergen, Norway, 2009.
 Gerlinde Emsenhuber. *Visibility Histograms in Direct Volume Rendering*. Master's Thesis. Vienna University of Technology, Austria, 2008.
 Moritz Gerl. *Volume Hatching for Illustrative Visualization*. Master's Thesis. Vienna University of Technology, Austria, 2006.
 Leopold Kühschelm. *Advanced Image-based Transfer Function Design*. Master's Thesis. Vienna University of Technology, Austria, 2005.

Publications

- [1] P.-C. Herghelegiu, R. Perin, V.-I. Manta, **S. Bruckner**, M. E. Gröller, "Biopsy Planner - Visual Analysis for Needle Pathway Planning in Deep Seated Brain Tumor Biopsy," to appear in *Computer Graphics Forum*, vol. 31, no. 3, 2012 (accepted for publication, to be presented at *EuroVis 2012*).
- [2] Å. Birkeland, **S. Bruckner**, A. Brambilla, and I. Viola, "Illustrative Membrane Clipping," to appear in *Computer Graphics Forum*, vol. 31, no. 3, 2012 (accepted for publication, to be presented at *EuroVis 2012*).
- [3] T. Ropinski, S. Diepenbrock, **S. Bruckner**, K. Hinrichs, and M. E. Gröller, "Unified Boundary-Aware Texturing for Interactive Volume Rendering," to appear in *IEEE Transactions on Visualization and Computer Graphics*, 2012 (accepted for publication, electronic preprint published online 2011-12-07).
- [4] M. Haidacher, **S. Bruckner**, and M. E. Gröller, "Volume analysis using multimodal surface similarity," *IEEE Transactions on Visualization and Computer Graphics*, vol. 17, no. 6, pp. 1969–1978, 2011.
- [5] D. Patel, M. E. Gröller, and **S. Bruckner**, "PhD education through apprenticeship," in *Proceedings of Eurographics 2011 - Education Papers*, 2011, pp. 23–28.
- [6] **S. Bruckner**, M. E. Gröller, K. Mueller, B. Preim, and D. Silver, "Illustrative focus+context approaches in interactive volume visualization," in *Scientific Visualization: Advanced Concepts*, ser. Dagstuhl Follow-Ups, H. Hagen, Ed., 2010, ch. 10.
- [7] P. Sikachev, P. Rautek, **S. Bruckner**, and M. E. Gröller, "Dynamic focus+context for volume rendering," in *Proceedings of Vision, Modeling, and Visualization 2010*, 2010, pp. 331–338.

- [8] **S. Bruckner** and T. Möller, “Result-driven exploration of simulation parameter spaces for visual effects design,” *IEEE Transactions on Visualization and Computer Graphics*, vol. 16, no. 6, pp. 1467–1475, 2010.
- [9] **S. Bruckner**, P. Rautek, I. Viola, M. Roberts, M. C. Sousa, and M. E. Gröller, “Hybrid visibility compositing and masking for illustrative rendering,” *Computers & Graphics*, vol. 34, no. 4, pp. 361–369, 2010.
- [10] V. Šoltészová, D. Patel, **S. Bruckner**, and I. Viola, “A multidirectional occlusion shading model for direct volume rendering,” *Computer Graphics Forum*, vol. 29, no. 3, pp. 883–891, 2010.
- [11] **S. Bruckner** and T. Möller, “Isosurface similarity maps,” *Computer Graphics Forum*, vol. 29, no. 3, pp. 773–782, 2010, **EUROVIS 2010 BEST PAPER AWARD**.
- [12] D. Patel, **S. Bruckner**, I. Viola, and M. E. Gröller, “Seismic volume visualization for horizon extraction,” in *Proceedings of IEEE Pacific Visualization 2010*, 2010, pp. 73–80.
- [13] M. Haidacher, D. Patel, **S. Bruckner**, A. Kanitsar, and M. E. Gröller, “Volume visualization based on statistical transfer-function spaces,” in *Proceedings of IEEE Pacific Visualization 2010*, 2010, pp. 17–24.
- [14] **S. Bruckner**, V. Šoltészová, M. Gröller, J. Hladůvka, K. Bühler, J. Y. Yu, and B. J. Dickson, “BrainGazer – visual queries for neurobiology research,” *IEEE Transactions on Visualization and Computer Graphics*, vol. 15, no. 6, pp. 1497–1504, 2009.
- [15] **S. Bruckner** and M. E. Gröller, “Instant volume visualization using maximum intensity difference accumulation,” *Computer Graphics Forum*, vol. 28, no. 3, pp. 775–782, 2009.
- [16] P. Kohlmann, **S. Bruckner**, A. Kanitsar, and M. E. Gröller, “Contextual picking of volumetric structures,” in *Proceedings of the IEEE Pacific Visualization 2009*, 2009, pp. 185–192.
- [17] M. Haidacher, **S. Bruckner**, A. Kanitsar, and M. E. Gröller, “Information-based transfer functions for multimodal visualization,” in *Proceedings of Visual Computing for Biomedicine 2008*, 2008, pp. 101–108.
- [18] M. Ruiz, I. Viola, I. Boada, **S. Bruckner**, M. Feixas, and M. Sbert, “Similarity-based exploded views,” in *Proceedings of Smart Graphics 2008*, 2008, pp. 154–165.
- [19] M. Ruiz, I. Boada, I. Viola, **S. Bruckner**, M. Feixas, and M. Sbert, “Obscure-based volume rendering framework,” in *Proceedings of Volume Graphics 2008*, 2008, pp. 113–120.
- [20] P. Kohlmann, **S. Bruckner**, A. Kanitsar, and M. E. Gröller, “LiveSync++: Enhancements of an interaction metaphor,” in *Proceedings of Graphics Interface 2008*, 2008, pp. 81–88.
- [21] P. Rautek, **S. Bruckner**, and M. E. Gröller, “Interaction-dependent semantics for illustrative volume rendering,” *Computer Graphics Forum*, vol. 27, no. 3, pp. 847–854, 2008.
- [22] **S. Bruckner**, P. Kohlmann, A. Kanitsar, and M. E. Gröller, “Integrating volume visualization techniques into medical applications,” in *Proceedings of the International Symposium on Biomedical Imaging 2008*, 2008, pp. 820–823.
- [23] **S. Bruckner** and M. E. Gröller, “Enhancing depth-perception with flexible volumetric halos,” *IEEE Transactions on Visualization and Computer Graphics*, vol. 13, no. 6, pp. 1344–1351, 2007.
- [24] P. Rautek, **S. Bruckner**, and M. E. Gröller, “Semantic layers for illustrative volume rendering,” *IEEE Transactions on Visualization and Computer Graphics*, vol. 13, no. 6, pp. 1336–1343, 2007.
- [25] P. Kohlmann, **S. Bruckner**, A. Kanitsar, and M. E. Gröller, “LiveSync: Deformed viewing spheres for knowledge-based navigation,” *IEEE Transactions on Visualization and Computer Graphics*, vol. 13, no. 6, pp. 1544–1551, 2007.
- [26] **S. Bruckner** and M. E. Gröller, “Style transfer functions for illustrative volume rendering,” *Computer Graphics Forum*, vol. 26, no. 3, pp. 715–724, 2007, **EUROGRAPHICS 2007 3RD BEST PAPER AWARD**.
- [27] P. Kohlmann, **S. Bruckner**, A. Kanitsar, and M. E. Gröller, “Evaluation of a bricked volume layout for a medical workstation based on java,” *Journal of WSCG*, vol. 15, no. 1-3, pp. 83–90, 2007.

- [28] P. Rautek, B. Csebfalvi, S. Grimm, **S. Bruckner**, and M. E. Gröller, "D²VR: High quality volume rendering of projection-based volumetric data," in *Proceedings of EuroVis 2006*, 2006, pp. 211–218.
- [29] **S. Bruckner** and M. E. Gröller, "Exploded views for volume data," *IEEE Transactions on Visualization and Computer Graphics*, vol. 12, no. 5, pp. 1077–1084, 2006.
- [30] **S. Bruckner**, S. Grimm, A. Kanitsar, and M. E. Gröller, "Illustrative context-preserving exploration of volume data," *IEEE Transactions on Visualization and Computer Graphics*, vol. 12, no. 6, pp. 1559–1569, 2006.
- [31] **S. Bruckner**, S. Grimm, A. Kanitsar, and M. E. Gröller, "Illustrative context-preserving volume rendering," in *Proceedings of EuroVis 2005*, 2005, pp. 69–76.
- [32] **S. Bruckner** and M. E. Gröller, "VolumeShop: An interactive system for direct volume illustration," in *Proceedings of IEEE Visualization 2005*, 2005, pp. 671–678.
- [33] E. Coto, S. Grimm, **S. Bruckner**, M. E. Gröller, A. Kanitsar, and O. Rodriguez, "MammoExplorer: An advanced CAD application for breast DCE-MRI," in *Proceedings of Vision, Modeling, and Visualization 2005*, 2005, pp. 91–98.
- [34] S. Grimm, **S. Bruckner**, A. Kanitsar, and M. E. Gröller, "Flexible direct multi-volume rendering in interactive scenes," in *Proceedings of Vision, Modeling, and Visualization 2004*, 2004, pp. 386–379.
- [35] S. Grimm, **S. Bruckner**, A. Kanitsar, and M. E. Gröller, "Memory efficient acceleration structures and techniques for CPU- based volume raycasting of large data," in *Proceedings of the Symposium on Volume Visualization and Graphics 2004*, 2004.
- [36] S. Grimm, **S. Bruckner**, A. Kanitsar, and M. E. Gröller, "Vots: Volume dots as a point-based representation of volumetric data," *Computer Graphics Forum*, vol. 23, no. 4, 2004.
- [37] S. Grimm, **S. Bruckner**, A. Kanitsar, and M. E. Gröller, "A refined data addressing and processing scheme to accelerate volume raycasting," *Computers & Graphics*, vol. 28, no. 5, 2004.
- [38] **S. Bruckner**, "Efficient volume visualization of large medical datasets," in *Proceedings of the Central European Seminar on Computer Graphics 2004*, 2004, **CESCG 2004 BEST PAPER AWARD**.
- [39] **S. Bruckner**, D. Schmalstieg, H. Hauser, and M. E. Gröller, "The inverse warp: Non-invasive integration of shear-warp volume rendering into polygon rendering pipelines," in *Proceedings of Vision, Modeling, and Visualization 2003*, 2003, pp. 529–536.