

Alan Brunton

Contact

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Education

Ph.D. in Computer Science, *University of Ottawa 2007-present*

Master of Computer Science, *University of Ottawa 2004-2006*. Degree conferred December 2006. GPA 8.4/10 (A-/A).

Bachelor of Computer Science, Co-op, High Honours, *Carleton University 1999-2004*. Degree conferred June 10, 2004. Overall GPA 9.6/12 (A-/B+); core GPA 9.95/12 (A-/B+).

Publications

Journal papers

1. Alan Brunton, Stefanie Wuhrer, Chang Shu, Prosenjit Bose, and Erik Demaine. “*Filling Holes in Triangular Meshes Using Digital Images by Curve Unfolding*”, *International Journal of Shape Modeling*, 16(1-2):151-171, 2010.
2. Stefanie Wuhrer, Prosenjit Bose, Chang Shu, Joseph O’Rourke, and Alan Brunton. “*Morphing of Triangular Meshes in Shape Space*”, *International Journal of Shape Modeling*, 16(1-2):195-212, 2010.
3. Alan Brunton, Jochen Lang and Eric Dubois, “*Spherical Harmonic Transforms and Convolutions on the GPU*”, *Journal of Graphics, GPU, and Game Tools*, 15(1):13-27, 2010.
4. Stefanie Wuhrer and Alan Brunton, “*Segmenting Animated Objects Into Near-Rigid Components*”, *The Visual Computer*, 26(2), 2010.
5. Chang Shu, Alan Brunton and Mark Fiala, “*A Topological Approach to Finding Grids in Calibration Patterns*”, *Machine Vision and Applications Journal*, 21(6):949-957, 2010.

Conference papers

1. Alan Brunton, Chang Shu, Jochen Lang and Eric Dubois, “*Wavelet Model-based Stereo for Fast, Robust Face Reconstruction*”, *Eighth Canadian Conference on Computer and Robot Vision (CRV)*, May 2011.
2. Alan Brunton, Stefanie Wuhrer, Chang Shu, Prosenjit Bose and Erik D. Demaine, “*Filling Holes in Triangular Meshes by Curve Unfolding*”, *In IEEE International Conference on Shape Modeling and Applications (SMI)*, 2009.
3. Alan Brunton, Stefanie Wuhrer and Chang Shu, “*Image-based Model Completion*”, *Sixth International Conference on 3-D Digital Imaging and Modeling (3DIM)*, August 2007.
4. Alan Brunton and Chang Shu, “*Belief Propagation for Panorama Generation*”, *Third International Symposium on the Processing, Transmission and Visualization of 3D Data (3DPVT)*, June 2006.
5. Alan Brunton, Chang Shu and Gerhard Roth, “*Belief Propagation on the GPU for Stereo Vision*”, *Third Canadian Conference on Computer and Robot Vision (CRV)*, June 2006.
6. Alan Brunton and Jiying Zhao, “*Real-Time Video Watermarking on Programmable Graphics Hardware*”, *Canadian Conference on Electrical and Computer Engineering (CCECE)*, May 2005.
7. Derek Bradley, Alan Brunton, Mark Fiala and Gerhard Roth, “*Image-Based Navigation in Real Environments Using Panoramas*”, *IEEE International Workshop on Haptic Audio Environments and their Applications (HAVE 2005)*, October 2005.
8. Chang Shu, Alan Brunton and Mark Fiala, “*CAMcal: A Program for Camera Calibration Using Checkerboard Patterns*” *The Ninth International Conference on Computer Vision (ICCV) (Demo Session)*, October 2003.

Other

1. Alan Brunton, *A Bayesian Framework for Panoramic Imaging of Complex Scenes*, Master’s Thesis, University of Ottawa, submitted September 20, 2006.

Invited Talks

1. Belief Propagation and Applications to Computer Vision and Image Processing. Canadian Conference on Computer and Robot Vision Tutorial Day, May 2010.

Service to the Scientific Community

- Referee for journals: IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on Broadcasting
- Referee for conferences: 3DIM 2007, 3DIM 2009, EuroCG 2009, VISAPP 2010, CGI 2011

- Language editor for Central European Journal on Computer Science

Additional Achievements

- Admission Scholarship University of Ottawa, 2007-present
- Admission Scholarship University of Ottawa, 2004-2006
- Cognos Scholarship Carleton University 2000
- Dean's Honours List Carleton University 2000-2001
- Nortel Networks Scholarship Carleton University, 1999-2001

Work Experience

Research Assistant, University of Ottawa September 2007–Present

- Research on panoramic imaging and vision system for real-time virtual navigation in real environments

Sessional Instructor, Carleton University September 2007–December 2007

- Instructor for COMP 3501 *Foundations of Game Programming and Computer Graphics*
- real-time 3D graphics, GPU programming

Programmer / Research Assistant, National Research Council–Institute for Information Technology November 2006–August 2007.

- part-time with Computation Video Group working on camera pose estimation.
- part-time with Visual Information Technology Group working on image-based hole-filling for incomplete 3D models.

Guest Worker, National Research Council–Institute for Information Technology 2004-2006.

- worked in the Computational Video group on research for my Master's thesis
- wrote capture software for Point Grey Ladybug panoramic camera
- developed method for generating cubic panoramas from multiple images using Bayesian belief propagation on Markov random fields

Software Developer, National Research Council–Institute for Information Technology January 2003–August 2003. Worked for the Computational Video group as a co-op student on the following

- pattern extraction techniques for camera calibration

- video stabilization using a mosaicking technique
- multiple camera calibration
- volumetric reconstruction from photoconsistency
- distributed video capture

Software Developer, Combustion Dynamics Ltd./Martec Ltd. May 2002–August 2002. Worked as a co-op student on the following aspects of a Computational Fluid Dynamics (CFD) simulation system

- developed shape detection for an Adaptive Gridding System (multi-resolution simulation)
- developed prototype for parallel CFD system using MPI

Software Developer, Corel Corporation September 2001–December 2001. Worked as a co-op student on the Bryce ray-tracing software

- performed bug-fixing duties
- designed and began implementation for video texture support

Software Developer, National Research Council–Institute for Information Technology May 2001–August 2001. Worked as a co-op student in the computational video group on

- 3D point-set registration; approximate nearest neighbor algorithm as part of Iterative Closest Point (ICP) registration of laser-scanned point clouds.

Software Developer, Combustion Dynamics Ltd. May 2000–August 2000. Worked as a co-op student on CFD system

- wrote dynamically customizable graphical user interface (GUI) in Java (Swing)
- implemented an Adaptive Gridding System for multi-resolution fluid simulation.
- wrote mesh manipulation code to position and orient polygon meshes