

# MINGLUN GONG

*ASSOCIATE PROFESSOR*

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## **EDUCATION AND DEGREES:**

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- Nov. 2003     **Doctor of Philosophy in Computer Science**  
Department of Computing Science, University of Alberta, Canada  
Supervisor:    Dr. Yee-Hong Yang  
Dissertation:  Rayset and its applications to static and dynamic image synthesis
- Jul. 1997     **Master of Science in Computer Science**  
Department of Computer Science & Technology, Tsinghua University, P. R. China  
Thesis:        Rendering and real time walkthrough techniques for architectural modeling
- Jul. 1994     **Bachelor of Engineering**  
Harbin Engineering University, P. R. China  
Majors:        Computer Science & Mechanical Engineering

## **EMPLOYMENT HISTORY:**

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- 2010 ~ Pres.   **Associate Professor, Memorial University of Newfoundland**
- 2010 ~ 2011   **Visiting Professor, Shenzhen Institute of Advanced Technology**
- 2007 ~ 2010.   **Assistant Professor, Memorial University of Newfoundland**  
Graduate courses developed and taught: "Computational Photography (COMP 6786)," and "General Computing on Graphics Hardware (COMP 6784)."  
Undergraduate course taught: "Computer Graphics (COMP 4751)."  
Undergraduate course jointly developed and taught: "Software Development for Mobile Devices (COMP 4768)."
- 2006 ~ Pres.   **Assistant Adjunct Professor, University of Alberta**  
Co-supervising graduate students with Dr. Y.-H. Yang.
- 2003 ~ 2007   **Assistant Professor, Laurentian University**  
Courses taught: "Computer Graphics (COSC 4306)," "Topics in Computer Vision (COSC 4426)," "Directed Studies in Graphics Hardware Programming (COSC 4706)," "Analysis of Algorithms (COSC 4106)," "Parallel Computing (COSC 4456)," "Object Oriented Programming Using C++ (COSC 2947)," "Assembly Language Programming (COSC 2406)," and "Data Structures II (COSC 2007)."

- 2001 ~ 2003    Teaching Assistant, University of Alberta
- 1999 ~ 2000    Sessional Lecturer, University of Saskatchewan  
Taught “Principles of Computer Science (CMPT 115)” for two summer terms.
- 1998 ~ 2000    Teaching Assistant, University of Saskatchewan
- 1997 ~ 1998    Software Engineer, China Academy of Building Research

## **RESEARCH CONTRIBUTIONS:**

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### ***Refereed Journal Articles:***

1. Hui Huang, Shihao Wu, Minglun Gong, Daniel Cohen-Or, Uri Ascher, & Hao Zhang: Edge-aware point set resampling. *ACM Transactions on Graphics* (provisionally accepted). 2011.
2. Liang Wang, Minglun Gong, Chenxi Zhang, Ruigang Yang, Cha Zhang, & Yee-Hong Yang: Real-time video matting using time-of-flight camera and multichannel Poisson equations (<http://dx.doi.org/10.1007/s11263-011-0471-x>). *International Journal of Computer Vision* (in press). 2011.
3. Miao Liao, Jizhou Gao, Ruigang Yang, & Minglun Gong: Video stereolization: Combining motion analysis with user interaction (<http://dx.doi.org/10.1109/TVCG.2011.114>). *IEEE Transactions on Visualization and Computer Graphics* (in press). 2011.
4. Enamul Hoque, Orland Hoerber, Grant Strong, & Minglun Gong: Combining conceptual query expansion and visual search results exploration for web image retrieval (<http://dx.doi.org/10.1007/s12652-011-0094-7>). *Journal of Ambient Intelligence and Humanized Computing* (in press). 2011.
5. Minglun Gong, Yilei Zhang, & Yee-Hong Yang: Near-real-time stereo matching with slanted surface modeling and sub-pixel accuracy (<http://dx.doi.org/10.1016/j.patcog.2011.03.028>). *Pattern Recognition* 44(10-11): 2701-2710. October-November 2011.
6. Grant Strong & Minglun Gong: Similarity-based image organization and browsing using multi-resolution self organizing map (<http://dx.doi.org/10.1016/j.imavis.2011.08.007>). *Image and Vision Computing* 29(11): 774-786. October 2011.
7. Li Cheng, Minglun Gong, Dale Schuurmans, & Terry Caelli: Real-time discriminative background subtraction (<http://dx.doi.org/10.1109/TIP.2010.2087764>). *IEEE Transactions on Image Processing* 20(5): 1401-1414. May 2011.
8. Minglun Gong: Real-time joint disparity and disparity flow estimation on programmable graphics hardware (<http://dx.doi.org/10.1016/j.cviu.2008.07.007>). *Computer Vision and Image Understanding* 113(1): 90-100. January 2009.
9. Minglun Gong, Ruigang Yang, Liang Wang, & Mingwei Gong: A performance study on different cost aggregation approaches used in real-time stereo matching (<http://dx.doi.org/10.1007/s11263-006-0032-x>). *International Journal of Computer Vision* 75(2): 1573-1405. November 2007. (Citation count: 76)

10. Minglun Gong & Yee-Hong Yang: Real-time stereo matching using orthogonal reliability-based dynamic programming (<http://dx.doi.org/10.1109/TIP.2006.891344>). *IEEE Transactions on Image Processing* 16(3): 879-884. March 2007.
11. Minglun Gong & Yee-Hong Yang: Estimate large motions using the reliability-based motion estimation algorithm (<http://dx.doi.org/10.1007/s11263-006-5099-x>). *International Journal of Computer Vision* 68(3): 319-330. July 2006.
12. Minglun Gong & Yee-Hong Yang: Rayset: A taxonomy for image-based rendering (<http://dx.doi.org/10.1142/S0219467806002288>). *International Journal of Image and Graphics* 6(3): 313-339. July 2006.
13. Minglun Gong & Yee-Hong Yang: Fast unambiguous stereo matching using reliability-based dynamic programming (<http://dx.doi.org/10.1109/TPAMI.2005.120>). *IEEE Transactions on Pattern Analysis and Machine Intelligence* 27(6): 998-1003. June 2005.
14. Minglun Gong & Yee-Hong Yang: Camera field rendering for static and dynamic scenes (<http://dx.doi.org/10.1016/j.gmod.2004.06.004>). *Graphical Models* 67(2): 73-99. March 2005.
15. Minglun Gong & Yee-Hong Yang: Quadtree-based genetic algorithm and its applications to computer vision (<http://dx.doi.org/10.1016/j.patcog.2004.02.004>). *Pattern Recognition* 37(8): 1723-1733. August 2004.
16. Minglun Gong & Yee-Hong Yang: Genetic-based stereo algorithm and disparity map evaluation (<http://dx.doi.org/10.1023/A:1014529404956>). *International Journal of Computer Vision* 47(1-3): 63-77. April-June 2002.
17. Minglun Gong & Yee-Hong Yang: Layer-based morphing (<http://dx.doi.org/10.1006/gmod.2000.0537>). *Graphical Models* 63(1): 45-59. January 2001.
18. Kaihuai Qin, Minglun Gong, Youjiang Guan, & Wenping Wang: A new method for speeding up ray tracing NURBS surfaces ([http://dx.doi.org/10.1016/S0097-8493\(97\)87263-9](http://dx.doi.org/10.1016/S0097-8493(97)87263-9)). *Computers & Graphics* 21(5): 577-586. September-October 1997.
19. Kaihuai Qin, Minglun Gong, Bian Wu, & Zesheng Tang: Evolutive algorithm for the minimum weight triangulation. *Journal of Tsinghua University* 37(4): 53-58. April 1997.
20. Kaihuai Qin & Minglun Gong: Hybrid graphics-based and image-based ray tracing. *Journal of Computer Research and Development* 34(1). January 1997.
21. Minglun Gong & Kaihuai Qin: Ray tracing techniques for architectural modeling and environmental images. *China Journal of Image and Graphics* 1(5): 448-454. November 1996.
22. Kaihuai Qin, Minglun Gong, Bian Wu, & Zesheng Tang: The genetic minimum weight triangulation of planar points. *Journal of Computer-Aided Design & Computer Graphics* 8(Suppl): 141-147. September 1996.
23. Kaihuai Qin, Minglun Gong, & Geliang Tong: Fast ray tracing NURBS surfaces (<http://dx.doi.org/10.1007/BF02943518>). *Journal of Computer Science and Technology* 11(1): 17-29. January 1996.
24. Wenbo He, Minglun Gong, & Weiqiang Wang: The makespan of information transfers. *Journal of Harbin Engineering University* 16(3): 113-118. September 1995.

**Articles Submitted to Refereed Journal:**

25. Miao Liao, Liang Wang, Ruigang Yang, & Minglun Gong: Light fall-off stereo. Submitted to *IEEE Transactions on Image Processing*, April 2011.

**Refereed Papers in Prestigious Conferences:**

26. Minglun Gong & Li Cheng: Foreground segmentation of live videos using locally competing 1SVMs. *Conference on Computer Vision and Pattern Recognition*: 2105-2112. Colorado Springs, CO, USA, June 21-23, 2011. (Acceptance rate: 440/1677=26%)
27. Miao Liao, Qing Zhang, Huamin Wang, Ruigang Yang, & Minglun Gong: Modeling deformable objects from a single depth camera (<http://dx.doi.org/10.1109/ICCV.2009.5459161>). *International Conference on Computer Vision*: 167-174. Kyoto, Japan, September 27-October 2, 2009. (Oral, Acceptance rate: 48/1327=3.6%)
28. Li Cheng & Minglun Gong: Realtime background subtraction from dynamic scenes (<http://dx.doi.org/10.1109/ICCV.2009.5459454>). *International Conference on Computer Vision*: 2066-2073. Kyoto, Japan, September 27-October 2, 2009. (Acceptance rate: 308/1327=23%)
29. Liang Wang, Hailin Jin, Ruigang Yang, & Minglun Gong: Stereoscopic inpainting: Joint color and depth completion from stereo images (<http://dx.doi.org/10.1109/CVPR.2008.4587704>). *Conference on Computer Vision and Pattern Recognition*: 1-8. Anchorage, AK, USA, June 24-26, 2008. (Acceptance rate: 508/1593=32%)
30. Miao Liao, Liang Wang, Ruigang Yang, & Minglun Gong: Light fall-off stereo (<http://dx.doi.org/10.1109/CVPR.2007.383159>). *Conference on Computer Vision and Pattern Recognition*: 1-8. Minneapolis, MN, USA, June 18-23, 2007. (Acceptance rate: 351/1250=28%)
31. Minglun Gong: Enforcing temporal consistency in real-time stereo estimation ([http://dx.doi.org/10.1007/11744078\\_44](http://dx.doi.org/10.1007/11744078_44)). *European Conference on Computer Vision*: 564-577. Graz, Austria, May 7-13, 2006. (Acceptance rate: 193/900=21%)
32. Minglun Gong & Yee-Hong Yang: Near real-time reliable stereo matching using programmable graphics hardware (<http://dx.doi.org/10.1109/CVPR.2005.246>). *Conference on Computer Vision and Pattern Recognition (I)*: 924-931. San Diego, CA, USA, June 20-26, 2005. (Acceptance rate: 322/1200=27%, Citation count: 88)
33. Minglun Gong & Yee-Hong Yang: Fast stereo matching using reliability-based dynamic programming and consistency constraints (<http://dx.doi.org/10.1109/ICCV.2003.1238404>). *International Conference on Computer Vision (I)*: 610-617. Nice, France, October 13-16, 2003. (Acceptance rate: 200/943=21%)

**Refereed Book Chapters:**

34. Enamul Hoque, Grant Strong, Orland Hoerber, & Minglun Gong: Conceptual query expansion and visual search results exploration for web image retrieval ([http://dx.doi.org/10.1007/978-3-642-18029-3\\_8](http://dx.doi.org/10.1007/978-3-642-18029-3_8)). *Advances in Intelligent and Soft Computing* (86), *Advances in Intelligent Web Mastering*: 73-82. Springer Berlin, 2011.
35. Grant Strong, Enamul Hoque, Minglun Gong, & Orland Hoerber: Organizing and browsing image search results based on conceptual and visual similarities (<http://dx.doi.org/10.1007/978->

- [3-642-17274-8 47](#)). *Lecture Notes In Computer Science* (6454), *Advances in Visual Computing*: 481-490. Springer Berlin, 2010.
36. Grant Strong, Orland Hoerber, & Minglun Gong: Visual image browsing and exploration (vibe): user evaluations of image search tasks ([http://dx.doi.org/10.1007/978-3-642-15470-6\\_44](http://dx.doi.org/10.1007/978-3-642-15470-6_44)). *Lecture Notes in Computer Science* (6335), *Active Media Technology*: 424-435. Springer Berlin, 2010.
37. Grant Strong & Minglun Gong: Browsing a large collection of community photos based on similarity on GPU ([http://dx.doi.org/10.1007/978-3-540-89646-3\\_38](http://dx.doi.org/10.1007/978-3-540-89646-3_38)). *Lecture Notes In Computer Science* (5359), *Advances in Visual Computing*: 390-399. Springer Berlin, 2008.
38. Nicolas Robidoux, Adam Turcotte, Minglun Gong, & Annie Tousignant: Fast exact area image upsampling with natural biquadratic histosplines ([http://dx.doi.org/10.1007/978-3-540-69812-8\\_9](http://dx.doi.org/10.1007/978-3-540-69812-8_9)). *Lecture Notes in Computer Science* (5112), *Image Analysis and Recognition*: 85-96. Springer Berlin, 2008.
39. Minglun Gong, Aaron Langille, & Mingwei Gong: Real-time image processing using graphics hardware: A performance study ([http://dx.doi.org/10.1007/11559573\\_147](http://dx.doi.org/10.1007/11559573_147)). *Lecture Notes in Computer Science* (3656), *Image Analysis and Recognition*: 1217-1225. Springer Berlin, 2005.

**Refereed Conference Proceeding Papers:**

40. Minglun Gong & Li Cheng: Incorporating estimated motion in real-time background subtraction. *International Conference on Image Processing*. Brussels, Belgium, September 11-14, 2011. (Oral, Acceptance rate: 336/2245=15%)
41. Enamul Hoque, Orland Hoerber, & Minglun Gong: Evaluating the trade-offs between diversity and precision for web image search using concept-based query expansion (<http://dx.doi.org/10.1109/WI-IAT.2011.11>). *WI-IAT Workshop on Intelligent Web Interaction* (3): 130-133. Lyon, France, August 22, 2011.
42. Grant Strong & Minglun Gong: Data organization and visualization using self-sorting map. *Graphics Interface*: 199-206. St. John's, NL, Canada, May 25-27, 2011. (Oral, Acceptance rate: 29/74=39%)
43. Jason Gedge, Minglun Gong, & Yee-Hong Yang: Refractive epipolar geometry for underwater stereo matching. *Canadian Conference on Computer and Robot Vision*. St. John's, NL, Canada, May 25-27, 2011. (Oral, Acceptance rate: 28/74=38%)
44. Minglun Gong, Liang Wang, Ruigang Yang, & Yee-Hong Yang: Real-time video matting using multichannel Poisson equations. *Graphics Interface*: 89-96. Ottawa, ON, Canada, May 31-June 2, 2010. (Oral, Acceptance rate: 33/88=38%)
45. Miao Liao, Qing Zhang, Ruigang Yang, & Minglun Gong: A volumetric approach for merging range images of semi-rigid objects captured at different time instances. *International Symposium on 3D Data Processing, Visualization and Transmission*. Paris, France, May 17-20, 2010.
46. Grant Strong & Minglun Gong: Organizing and browsing photos using different feature vectors and their evaluations (<http://dx.doi.org/10.1145/1646396.1646401>). *International Conference on Image and Video Retrieval*. Santorini, Greece, July 8-10, 2009. (Oral, Acceptance rate: 17/127=13%)

47. Minglun Gong & Yee-Hong Yang: Near-real-time image matting with known background (<http://dx.doi.org/10.1109/CRV.2009.7>). *Canadian Conference on Computer and Robot Vision*: 81-87. Kelowna, BC, Canada, May 25-27, 2009. (Acceptance rate: 50%)
48. Nicolas Robidoux, Minglun Gong, John Cupitt, Adam Turcotte, & Kirk Martinez: CPU, SMP and GPU implementations of nohalo level 1, a fast co-convex antialiasing image resampler (<http://dx.doi.org/10.1145/1557626.1557657>). *C\* Conference on Computer Science & Software Engineering*: 185-195. Montreal, QC, Canada, May 19-21, 2009. (Oral, Acceptance rate: 22%)
49. Yilei Zhang, Minglun Gong, & Yee-Hong Yang: Local stereo matching with 3D adaptive cost aggregation for slanted surface modeling and sub-pixel accuracy (<http://dx.doi.org/10.1109/ICPR.2008.4761101>). *International Conference on Pattern Recognition*: 1-4. Tampa, FL, USA, December 8-11, 2008. (Oral, Acceptance rate: 295/1631=18%)
50. Minglun Gong & Li Cheng: Real-time foreground segmentation on GPUs using local online learning and global graph cut optimization (<http://dx.doi.org/10.1109/ICPR.2008.4761488>). *International Conference on Pattern Recognition*: 1-4. Tampa, FL, USA, December 8-11, 2008. (Acceptance rate: 1006/1631=62%)
51. Miao Liao, Liang Wang, Ruigang Yang, & Minglun Gong: Real-time light fall-off stereo (<http://dx.doi.org/10.1109/ICIP.2008.4712021>). *International Conference on Image Processing*: 1380-1383. San Diego, CA, USA, October 12-15, 2008. (Acceptance rate: 45%)
52. Yilei Zhang, Minglun Gong, & Yee-Hong Yang: Real-time multi-view stereo algorithm using adaptive-weight Parzen window and local winner-take-all optimization (<http://dx.doi.org/10.1109/CRV.2008.41>). *Canadian Conference on Computer and Robot Vision*: 113-120. Windsor, ON, Canada, May 28-30, 2008. (Oral)
53. Minglun Gong: Images restoration using an iterative dynamic programming approach (<http://dx.doi.org/10.1109/CRV.2007.40>). *Canadian Conference on Computer and Robot Vision*: 395-402. Montreal, QC, Canada, May 28-30, 2007. (Acceptance rate: 56/103=54%)
54. Minglun Gong, Jason M. Selzer, Cheng Lei, & Yee-Hong Yang: Real-time backward disparity-based rendering for dynamic scenes using programmable graphics hardware (<http://dx.doi.org/10.1145/1268517.1268557>). *Graphics Interface*: 241-248. Montreal, QC, Canada, May 28-30, 2007. (Oral, Acceptance rate: 43/89=48%)
55. Minglun Gong & Yee-Hong Yang: Disparity flow estimation using orthogonal reliability-based dynamic programming (<http://dx.doi.org/10.1109/ICPR.2006.456>). *International Conference on Pattern Recognition*: 70-73. Hong Kong, August 20-24, 2006. (Oral, Acceptance rate: 311/2029=15%)
56. Liang Wang, Miao Liao, Minglun Gong, Ruigang Yang, & David Nister: High-quality real-time stereo using adaptive cost aggregation and dynamic programming (<http://dx.doi.org/10.1109/3DPVT.2006.75>). *International Symposium on 3D Data Processing, Visualization and Transmission*: 798-805. Chapel Hill, NC, USA, June 14-16, 2006. (Oral, Citation count: 114)
57. Liang Wang, Mingwei Gong, Minglun Gong, & Ruigang Yang: How far can we go with local optimization in real-time stereo matching: A performance study on different cost aggregation approaches (<http://dx.doi.org/10.1109/3DPVT.2006.78>). *International Symposium on 3D Data Processing, Visualization and Transmission*: 129-136. Chapel Hill, NC, USA, June 14-16, 2006.

58. Aaron Langille & Minglun Gong: An efficient match-based duplication detection algorithm (<http://dx.doi.org/10.1109/CRV.2006.9>). *Canadian Conference on Computer and Robot Vision*. Quebec City, QC, Canada, June 7-9, 2006. (Acceptance rate: 77/113=68%)
59. Minglun Gong: A GPU-based algorithm for estimating 3D geometry and motion in near real-time (<http://dx.doi.org/10.1109/CRV.2006.4>). *Canadian Conference on Computer and Robot Vision*. Quebec City, QC, Canada, June 7-9, 2006. (Oral, Acceptance rate: 35/113=35%)
60. Minglun Gong & Ruigang Yang: Image-gradient-guided real-time stereo on graphics hardware (<http://dx.doi.org/10.1109/3DIM.2005.55>). *International Conference on 3-D Digital Imaging and Modeling*: 548-555. Ottawa, ON, Canada, June 13-17, 2005. (Oral, Acceptance rate: 39/127=31%)
61. Minglun Gong & Yee-Hong Yang: Estimate large motions using reliability-based dynamic programming (<http://dx.doi.org/10.1109/ICIP.2004.1421625>). *International Conference on Image Processing*: 2559-2562. Singapore, October 24-27, 2004. (Acceptance rate: 883/2040=43%)
62. Minglun Gong & Yee-Hong Yang: Uniform sampling for image-based rendering shiny objects. *Eurographics Short Papers*: 73-76. Grenoble, France, August 30-September 3, 2004. (Oral, Acceptance rate: 24/60=40%)
63. Minglun Gong: Motion estimation using dynamic programming with selective path search (<http://dx.doi.org/10.1109/ICPR.2004.589>). *International Conference on Pattern Recognition*: 203-206. Cambridge, United Kingdom, August 23-26, 2004. (Acceptance rate: 946/1781=53%)
64. Minglun Gong & Yee-Hong Yang: Multi-resolution genetic algorithm and its application in motion estimation (<http://dx.doi.org/10.1109/ICPR.2002.1044829>). *International Conference on Pattern Recognition*: 644-647. Quebec City, QC, Canada, August 11-15, 2002. (Acceptance rate: 805/1240=65%)
65. Minglun Gong & Yee-Hong Yang: Multi-resolution stereo matching using genetic algorithm (<http://dx.doi.org/10.1109/SMBV.2001.988759>). *CVPR Workshop on Stereo and Multi-Baseline Vision*: 21-29. Kauai, HI, USA, December 9-10, 2001. (Oral, Acceptance rate: 19/66=29%)
66. Minglun Gong & Yee-Hong Yang: Genetic-based multiresolution color image segmentation. *Vision Interface*: 71-80. Ottawa, ON, Canada, June 7-9, 2001.
67. Minglun Gong & Yee-Hong Yang: The rayset and its applications. *Graphics Interface*: 141-148. Ottawa, ON, Canada, June 7-9, 2001. (Oral, Acceptance rate: 27/56=48%)
68. Kaihuai Qin, Wenping Wang, & Minglun Gong: A genetic algorithm for the minimum weight triangulation (<http://dx.doi.org/10.1109/ICEC.1997.592370>). *International Conference on Evolutionary Computation*: 541-546. Indianapolis, IN, USA, April 13-16, 1997.

### **Refereed Conference Posters and Presentations:**

69. Enamul Hoque, Orland Hoerber, & Minglun Gong: A concept-based interactive visualization approach to web image search. *VisWeek (Poster)*. Providence, RI, USA, October 23-28 2011.
70. Aaron Maynard & Minglun Gong: Real-time seismic wave modeling and visualization. *Graphics Interface (Poster)*. Ottawa, ON, Canada, May 31-June 2 2010.

71. Huamin Wang, Miao Liao, Qing Zhang, Ruigang Yang, & Minglun Gong: Image-based physics-driven modeling of 4D fluid. *Mid-West Graphics Workshop*. Iowa City, IA, USA, October 19-21 2007.
72. Minglun Gong & Yee-Hong Yang: The super sprite: A graphic primitive based on light field. *Western Computer Graphics Symposium*. Silver Star, BC, Canada, March 24-27 2002.

### **Patents and Copyrights:**

73. Minglun Gong: Real-time foreground segmentation for live video. *PCT patent pending*. 2011. (Provisional application filed on June 2011)
74. Minglun Gong: Real-time image and video matting. *PCT patent pending*, Application No: PCT/CA2010/001237. 2010. (Provisional application filed on August 2009, Patent application filed on August 2010)
75. Minglun Gong: Fast stereo matching using reliability-based dynamic programming. *Software Copyright*, Canadian Registration No: 1023053, US Registration No: TXU001192131. August, 2004.

### **Invited Talks (other than conference presentations):**

- Real-time video matting — the extraction of foreground subjects with fuzzy boundaries from live footage. *Department of Computer Science, Memorial University of Newfoundland*. St. John's, NL, Canada, April 2, 2010.
- Real time detection of moving foreground objects. *Department of Computer Science, Nanjing University*. Nanjing, China, March 3, 2010.
- Real-time background subtraction using support vector machine. *Institute of Computing Technology of Chinese Academy of Sciences*. Beijing, China, February 25, 2010.
- Joint color and depth inpainting from stereo images. *CS VML Seminar, Simon Fraser University*. Burnaby, BC, Canada, June 1, 2009.
- Separating foreground from backgrounds. *Tutorial at Canadian Conference on Computer and Robot Vision*. Kelowna, BC, Canada, May 25, 2009.
- Organizing and browsing large photo collections based on similarity on GPU. *Faculty of Computer Science, Dalhousie University*. Halifax, NS, Canada, December 5, 2008.
- Real-time foreground detection from dynamic backgrounds on GPU. *Coast-to-Coast Seminar, ACEnet/D-Drive/IRMACS/SHARCNET/WestGrid*. St. John's, NL, Canada, October 28, 2008.
- Real-time rendering of dynamic scenes on graphics hardware. *Department of Computer Science, Memorial University of Newfoundland*. St. John's, NL, Canada, November 22, 2007.
- Depth recovery using light fall-off property. *Department of Computing Science, University of Alberta*. Edmonton, AB, Canada, July 23, 2007.
- Real-time image-based modeling and rendering for dynamic scenes. *Department of Computer Science, Memorial University of Newfoundland*. St. John's, NL, Canada, April 28, 2006.
- A real-time GPU-based disparity flow estimation algorithm. *Department of Computing Science, University of Alberta*. Edmonton, AB, Canada, August 9, 2005.

- Toward real-time marker-less motion tracking. *Workshop on Computer Simulation & Virtual Reality Applications*. Sudbury, ON, Canada, June 28, 2005.
- Real-time scene analysis and synthesis using programmable graphics hardware. *Center for Visualization and Virtual Environment, University of Kentucky*. Lexington, KY, USA, October 27, 2004.
- Analyze and synthesize dynamic scenes using programmable graphics hardware. *Microsoft Research Asia*. Beijing, China, August 18, 2004.
- Toward interactive 3D movies and immersive tele-presence. *Department of Mathematics and Computer Science, University of Lethbridge*. Lethbridge, AB, Canada, April 2, 2003.
- The rayset taxonomy and novel image-based rendering approaches. *Visual Computing Seminar, University of Alberta*. Edmonton, AB, Canada, March 27, 2003.
- Multi-resolution genetic algorithm and its applications in computer vision. *Visual Computing Seminar, University of Alberta*. Edmonton, AB, Canada, September 25, 2002.

## **STUDENT ADVISING:**

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### ***Current Students:***

- |        |                      |   |
|--------|----------------------|---|
| 2011 ~ | <b>Timothy Yau</b>   | <b>M.Sc. candidate, Univ. of Alberta (Co-sup: Dr. Y.-H. Yang)</b><br>Funded by NSERC Postgraduate Scholarship |
| 2009 ~ | <b>Grant Strong</b>  | <b>Ph.D. candidate, Memorial Univ.</b><br>Funded by Alexander Graham Bell Canada Graduate Scholarship         |
| 2010 ~ | <b>Zhi Li</b>        | <b>M.Sc. candidate, Memorial Univ. (Co-sup: Dr. O. Hoerber)</b>   |
| 2010 ~ | <b>Enamul Hoque</b>  | <b>M.Sc. candidate, Memorial Univ. (Co-sup: Dr. O. Hoerber)</b>   |
| 2008 ~ | <b>Aaron Maynard</b> | <b>M.Sc. candidate, Memorial Univ.</b>  |

### ***Former Graduate Students:***

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| 2009 ~ 2011 | <b>Jason Gedge</b>  | <b>M.Sc. thesis, Univ. of Alberta (Co-sup: Dr. Y.-H. Yang)</b><br>Thesis: Underwater stereo matching and its calibration<br>Funded by NSERC Postgraduate Scholarship and iCORE Graduate Student Scholarship in Information and Communications Technology |
| 2008 ~ 2010 | <b>Jun Zheng</b>    | <b>M.Sc. thesis, Memorial Univ.</b><br>Thesis: Real-time image registration and its app. in motion-visual hybrid controller  |
| 2007 ~ 2009 | <b>Grant Strong</b> | <b>M.Sc. thesis, Memorial Univ.</b><br>Thesis: Similarity-based image organization and browsing<br>Recipient of the “Fellow of the School of Graduate Studies” designation and the “University Medal for Excellence in Graduate Studies”                 |

2006 ~ 2008    **Yilei Zhang**            **M.Sc. thesis, Univ. of Alberta (Co-sup: Dr. Y.-H. Yang)**  
Thesis: Towards real-time adaptive support weight stereo algorithms  
Recipient of Alberta Ingenuity R&D Associates Award upon graduation

***Former Undergraduate Students:***

2008 ~ 2009    **Kenneth Smith**        **B.Engr. final project, Memorial Univ. (Co-sup: Dr. B. Veitch)**  
Project: GPU-based real-time 3D fluid simulator

Fall 2008        **Jason Gedge**            **B.Sc. honors thesis, Memorial Univ.**  
Thesis: Automatic panorama construction - An in-depth look into image stitching  
Recipient of NSERC Postgraduate Scholarship upon graduation

Summer 2008 **Jason Gedge**            **Undergrad intern, Memorial Univ.**  
Project: Scene modeling and rendering using computational photography  
Funded by NSERC Undergraduate Student Research Award

Summer 2006 **Adam Turcotte**        **Undergrad intern, Laurentian Univ.**  
Project: Image enhancement and enlargement for digital photography  
Funded by NSERC Undergraduate Student Research Award  
Recipient of NSERC Postgraduate Scholarship upon graduation

2005 ~ 2006    **Mathieu Dupont**        **B.Sc. honors thesis, Laurentian Univ.**  
Thesis: Texture synthesis - A study of single and multiresolution algorithms

2005 ~ 2006    **Donald Morgan**        **B.Sc. honors thesis, Laurentian Univ.**  
Thesis: Neural networks & reinforce. learning for motor control of a virtual creature  
Currently an M.Sc. student at McMaster Univ.  
Recipient of NSERC Postgraduate Scholarship upon graduation

Summer 2005 **Aaron Langille**        **Undergrad intern, Laurentian Univ.**  
Project: Digital image forgery detection using graphics hardware

2004 ~ 2005    **Aaron Langille**        **B.Sc. honors thesis, Laurentian Univ.**  
Thesis: Digital image forgery detection  
Currently a part-time Ph.D. student at Univ. of Guelph

Summer 2004 **John Whissell**            **Undergrad intern, Laurentian Univ.**  
Project: Photorealistic image synthesis using graphics hardware  
Currently a Ph.D. student at Univ. of Waterloo  
Recipient of NSERC Postgraduate Scholarship upon graduation

2003 ~ 2004    **Kevin Brosseau**        **B.Sc. honors thesis, Laurentian Univ.**  
Thesis: A strategic card game using A.I. with multiple levels of ingenuity

Fall 2003        **Matthew Bardeggia** **B.Sc. final project, Laurentian Univ.**  
Project: Non-photorealistic rendering with Cg

## **RESEARCH GRANTS:**

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### ***Support Currently Held:***

2007 ~ 2012	<b>NSERC Individual Discovery Grants</b>	<b>\$100,000</b>
	Five year award at \$20,000 per year for a research program titled "Real-time dynamic scene modeling and rendering".	
2009 ~ 2011	<b>RDC Industrial Research and Innovation Fund</b>	<b>\$50,000</b>
	Funded for a project titled "Parallel computer vision algorithms for real-time processing on GPUs."	

### ***Support Held in the Past:***

2009	<b>Springboard Patent &amp; Legal Fund Awards</b>	<b>\$10,000</b>
	Funded for a project titled "Real-time video matting for online background replacement". Institutional matching fund (\$2,250) is included.	
2007	<b>Memorial University Start-up Fund</b>	<b>\$25,000</b>
2004 ~ 2007	<b>NSERC Individual Discovery Grants</b>	<b>\$42,000</b>
	Three year award at \$14,000 per year for a research program titled "Dynamic image-based scene modeling and rendering".	
2005	<b>CFI New Opportunities Fund</b>	<b>\$46,623</b>
	Funded for an infrastructure project titled "A CPU/GPU cluster for scene analysis and synthesis". Matching funds from Ontario Innovation Trust (\$16,080) and business contribution (\$14,463) are included.	
2005	<b>Laurentian University Research Fund</b>	<b>\$2,800</b>
2004 ~ 2006	<b>CITO Research Partnerships Program (with Dr. Peter Kaiser)</b>	<b>\$170,000</b>
	Business cash (\$30,000) and in-kind (\$64,000) contributions are included. This is a two year program for supporting collaboration between science and engineering. The project is titled "Vision systems for underground support assessment".	
2004	<b>NSERC Research Tools and Instruments</b>	<b>\$22,168</b>
	Contribution from Laurentian University (\$2,500) is included. Funding is for setting up a multi-camera system that will be used in the "Dynamic image-based modeling and rendering" project.	
2004	<b>Laurentian University Research Fund</b>	<b>\$2,025</b>
2003	<b>Laurentian University Start-up Fund</b>	<b>\$10,000</b>
2002	<b>University of Alberta Killam Research Allowance</b>	<b>\$2,000</b>

## **HONORS AND AWARDS:**

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- Nov. 2005     **New Opportunity Fund Award, Canada Foundation for Innovation**  
Granted to selected new faculties who are taking up their first full-time academic appointment at an eligible Canadian university.
- May 2002 ~  
Aug. 2003     **Izaak Walton Killam Memorial Scholarship, University of Alberta**  
Granted for two years at \$20,100 annual plus tuition and fees. This is the most prestigious graduate award administered by the university. About 20 students are honored each year, chosen among doctoral students from all disciplines.
- Sept. 1998 ~  
Aug. 2001     **University Graduate Scholarship, University of Saskatchewan**  
A merit based award granted for three years at about \$16,000 per year.
- Jun. 1996     **The Second Prize of the Science & Technology Progress**  
Issued by the State Education Commission of China for the project developed by our research group in Tsinghua University.
- Oct. 1995     **Guanghua Scholarship, Tsinghua University**  
A one-time ¥1,200 scholarship awarded to top graduate students.
- Jul. 1994     **Outstanding Graduate, Harbin Engineering University**  
About 10 students are honored each year upon their graduations, chosen from over a thousand graduates.
- Mar. 1994     **Meritorious team in the Mathematical Contest in Modeling**  
Awarded to our 3-person team by the Consortium for Mathematics and Its Applications of US.
- Sept. 1991 ~  
Jul. 1994     **University Scholarships, Harbin Engineering University**  
Received a number of scholarships at different levels during my undergraduate study.

## **PROFESSIONAL ACTIVITIES:**

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### ***Program Committee Member for Conferences:***

- International Conference on Computer Vision: 2007, 2011
- Conference on Computer Vision and Pattern Recognition: 2008, 2011, 2012
- Graphics Interface: 2010, 2011, 2012
- Canadian Conference on Computer and Robot Vision: 2007, 2008, 2009, 2010, 2011, 2012
- Symposium on Web Society, 2011
- Canadian Conference on Electrical and Computer Engineering: 2009
- C\* Conference on Computer Science & Software Engineering: 2009

**Section Chair for Conferences:**

- Graphics Interface: 2010, 2011
- Canadian Conference on Computer and Robot Vision: 2006

**Editor for Journals:**

- ISRN Artificial Intelligence

**Reviewer for Journals:**

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Image Processing
- IEEE Transactions on Signal Processing
- Computer Vision and Image Understanding
- IEEE Transactions on Systems, Man and Cybernetics
- IEEE Transactions on Circuits and Systems for Video Technology
- IEEE Transactions on Multimedia
- IEEE Transactions on Broadcasting
- IEEE Signal Processing Letters
- Pattern Recognition
- Computers & Graphics
- Image and Vision Computing
- Journal of Real-Time Image Processing
- Machine Vision and Applications
- EURASIP Journal on Image and Video Processing
- Medical Engineering & Physics
- Medical Systems

**Reviewer for Conferences:**

- Eurographics
- Eurographics Workshop on Rendering
- Pacific Conference on Computer Graphics and Applications
- International Conference on Pattern Recognition
- Joint Conference on 3D Imaging Modeling Processing Visualization and Transmission
- International Symposium on 3D Data Processing Visualization and Transmission

**Reviewer for Granting Agencies:**

- Natural Sciences and Engineering Research Council of Canada (NSERC)
- Canada Foundation for Innovation (CFI)