

Jongwoo Lim

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RESEARCH INTEREST

- Geometric scene understanding for intelligent robots and smart vehicles.
- reconstruct scene geometry together with its semantic meaning from visual and other inputs.
 - design intelligent behaviors of robots and vehicles using the understandings of the environment.
- Visual tracking and scene understanding.
- track target objects in input videos and reason the subjects' activities and interactions.
- * research area : computer vision, machine learning, and robotics.

EDUCATION

University of Illinois, Urbana Champaign, Urbana, IL, USA

Ph.D. in Computer Science, Dec. 2005
Thesis: On Clustering Images of Objects
Advisor: Prof. David J. Kriegman
Aug. 2000 - Dec. 2005 (MS/PhD GPA: 4.0/4.0)

University of Illinois, Urbana Champaign, Urbana, IL, USA

M.S. in Computer Science, Dec. 2003
Thesis: Tracking Humans Using Prior and Learned Representations of Shape and Appearance
Advisor: Prof. David J. Kriegman

Seoul National University, Seoul, Korea

B.S. in Computer Science, Feb. 1997
summa cum laude (GPA 4.01/4.3)

EXPERIENCE

Assistant Professor, Hanyang University, Seoul, Korea, Feb. 2012 - Present
Division of Computer Science & Engineering

Software Engineer, Google, inc., Mountain View, CA, USA, Feb. 2011 - Feb. 2012
worked in Street View team, developing new algorithms for geometric environment modeling.

Senior Scientist, Honda Research Institute USA, inc., Mountain View, CA, Jul. 2005 - Feb. 2011
worked in computer vision, robotics and machine learning research for humanoid robots and intelligent vehicles.

Summer Intern, University of California, San Diego, La Jolla, CA, USA, Jun. 2004 - Aug. 2004
conducted research on multi-camera people tracking systems.

Summer Intern, Honda Research Institute, Mountain View, CA, USA, May. 2003 - Aug. 2003
developed the human face tracking and recognition system.

Research Assistant, University of Illinois, Urbana Champaign, Jan. 2001 - May. 2005
developed human tracking modules in the Active Space project (<http://devius.cs.uiuc.edu/gaia>).

Senior Programmer/Engineer, Triton Tech inc., Seoul, Korea, Jan. 1997 - Aug. 2000
designed and developed the CLUE system (content-based text auto-categorization system).
developed a Metadesk enterprise document management system.

SCHOLARSHIPS AND HONORS

Best Paper Award for “Visual Robot Localization and Map Building”
in Honda Research Institute Global Workshop, May 2010

Most Valuable Performance Award for 2007-2008
awarded extra \$50,000 research budget by Honda Research Institute USA inc., Apr 2008

Doctoral Study Abroad Scholarship
Korea Foundation for Advanced Studies, Aug. 2000 - Jul. 2005

College Student Scholarship
Korea Foundation for Advanced Studies, Mar. 1995 - Feb. 1997

Undergraduate Student Scholarship
Dongwon Education Foundation, Mar. 1996 - Feb. 1997

Honorary Scholarship
Seoul National University, Sep. 1993 - Feb. 1996

PUBLICATIONS

Ph.D. Thesis, *On Clustering Images of Objects*, University of Illinois at Urbana-Champaign, 2005

M.S. Thesis, *Tracking Humans Using Prior and Learned Representations of Shape and Appearance*,
University of Illinois at Urbana-Champaign, 2003

Journal Publications

1. David Ross, **Jongwoo Lim**, Ruei-Sung Lin, Ming-Hsuan Yang, “*Incremental Learning for Robust Visual Tracking*”, International Journal of Computer Vision (Special Issue: Learning for Vision), Vol. 77, No. 1-3, Pg. 125-141, May 2008 [778 citations¹]
 2. Vivek Pradeep, **Jongwoo Lim**, “*Egomotion Estimation Using Assorted Features*”, International Journal of Computer Vision, Vol. 98, Issue 2, Page 202-216, June 2012
 3. **Jongwoo Lim**, Jan-Michael Frahm, Marc Pollefeys, “*Online Environment Mapping using Metric-topological Maps*”, The International Journal of Robotics Research, Volume 31, Issue 12, Page 1394-1408, October 2012
- Jongwoo Lim, “*Optimized Projection Patterns for Stereo Systems*”, submitted to Image and Vision Computing, under revision.

Conference Publications

¹All citation counts are based on Google Scholar search results on Mar., 2014.

4. Jeffrey Ho, Ming-Hsuan Yang, **Jongwoo Lim**, Kuang-Chih Lee, David Kriegman, “*Clustering Appearances of Objects Under Varying Illumination Conditions*”, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2003, vol. 1, pp. 11-18
[oral presentation, acceptance rate 6.6%, 198 citations]
5. **Jongwoo Lim**, Jeffrey Ho, Ming-Hsuan Yang, Kuang-Chih Lee, David Kriegman, “*Image Clustering with Metric, Local Linear Structure and Affinity Symmetry*”, The 8th European Conference on Computer Vision (ECCV), 2004, vol 1, pp. 456-468 [acceptance rate 34.2%]
6. David Ross, **Jongwoo Lim**, Ming-Hsuan Yang, “*Adaptive Probabilistic Visual Tracking with Incremental Subspace Update*”, The 8th European Conference on Computer Vision (ECCV), 2004, vol 2, pp. 470-482 [acceptance rate 34.2%, 125 citations]
7. **Jongwoo Lim**, David Kriegman, “*Tracking Humans Using Prior and Learned Representations of Shape and Appearance*”, The 6th International Conference on Automatic Face and Gesture Recognition (FG), 2004, pp. 869-874
8. Ruei-Sung Lin, David Ross, **Jongwoo Lim**, Ming-Hsuan Yang, “*Adaptive Discriminative Generative Model and Its Applications*”, The 18th Annual Conference on Neural Information Processing Systems (NIPS), 2004, pp. 801-808 [acceptance rate ~30%, 80 citations]
9. **Jongwoo Lim**, David Ross, Ruei-Sung Lin, Ming-Hsuan Yang, “*Incremental Learning for Visual Tracking*”, The 18th Annual Conference on Neural Information Processing Systems (NIPS), 2004, pp. 793-800 [acceptance rate ~30%, 239 citations]
10. Sameer Agarwal, **Jongwoo Lim**, Lihi Zelnik-Manor, Pietro Perona, David Kriegman, Serge Belongie, “*Beyond Pairwise Clustering*”, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2005, vol. 2, pp. 838-845 [oral presentation, acceptance rate 6.5%, 97 citations]
11. **Jongwoo Lim**, Ming-Hsuan Yang, “*A Direct Method for Modeling Non-rigid Motion with Thin Plate Spline*”, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2005, vol. 1, pp. 1196-1202 [acceptance rate 28.1%, 52 citations]
12. **Jongwoo Lim**, Jeffrey Ho, Ming-hsuan Yang, David Kriegman, “*Passive Photometric Stereo from Motion*”, 10th IEEE International Conference on Computer Vision (ICCV), 2005, vol. 2, pp. 1635-1642 [acceptance rate 19.9%, 73 citations]
13. Jeffrey Ho, **Jongwoo Lim**, Ming-hsuan Yang, David Kriegman, “*Integrating Surface Normal Vectors Using Fast Marching Method*”, The 9th European Conference on Computer Vision (ECCV), 2006, part. 3, pp. 239-250 [acceptance rate 21.4%]
14. Benjamin Laxton, **Jongwoo Lim**, David Kriegman, “*Leveraging Temporal, Contextual and Ordering Constraints for Recognizing Complex Activities In Video*”, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2007, pp. 1-8 [acceptance rate 27.5%, 75 citations]
15. Victor Ng-Thow-Hing, Thor List, Kris Thorisson, **Jongwoo Lim**, Joel Wormer, “*Design and Evaluation of Communication Middleware in a Humanoid Robot Architecture*”, IROS 2007 Workshop on Measures and Procedures for the Evaluation of Robot Architectures and Middleware, Oct. 29, 2007, San Diego, CA, 2007
16. Victor Ng-Thow-Hing, **Jongwoo Lim**, Joel Wormer, Ravi Kiran Sarvadevabhatla, Carlos Rocha, Kikuo Fujimura, Yoshiaki Sakagami, “*The memory game: Creating a human-robot interactive scenario for ASIMO*”, The 2008 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2008, pp. 779-786
17. **Jongwoo Lim**, “*Optimized Projection Pattern Supplementing Stereo Systems*”, 2009 IEEE International Conference on Robotics and Automation (ICRA), 2009, pp. 2823 - 2829

18. Manmohan K. Chandraker, **Jongwoo Lim**, David J. Kriegman, “*Moving in Stereo: Efficient Structure and Motion Using Lines*”, 12th IEEE International Conference on Computer Vision (ICCV), 2009, pp 1741 - 1748 [acceptance rate ~24%, 29 citations]
19. Brian Clipp, Christopher Zach, **Jongwoo Lim**, Jan-Michael Frahm, Marc Pollefeys, “*Adaptive, Real-Time Visual Simultaneous Localization and Mapping*”, IEEE Workshop on Applications of Computer Vision (WACV), 2009, pp. 1-8
20. Vivek Pradeep, **Jongwoo Lim**, “*Egomotion using Assorted Features*”, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2010, pp. 1514 - 1521 [acceptance rate 26.8%]
21. Brian Clipp, **Jongwoo Lim**, Jan-Michael Frahm, Marc Pollefeys, “*Parallel, Real-Time Visual SLAM*”, 2010 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2010
22. **Jongwoo Lim**, Jan-Michael Frahm, Marc Pollefeys, “*Online Environment Mapping*”, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2011 [acceptance rate 26.4%]
23. Ananth Ranganathan, **Jongwoo Lim**, “*Visual Place Categorization in Maps*”, 2011 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2011
24. Christian Häne, Christopher Zach, **Jongwoo Lim**, Ananth Ranganathan, Marc Pollefeys, “*Stereo Depth Map Fusion for Robot Navigation*”, 2011 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2011
25. Mark Colbert, Jean-Yves Bouguet, Jeff Beis, Spudde Childs, Daniel Filip, Luc Vincent, **Jongwoo Lim**, Scott Satkin, “*Building indoor multi-panorama experiences at scale*”, ACM SIGGRAPH 2012 Talks, Article No. 24, 2012
26. Jin Han Lee, Guoxuan Zhang, **Jongwoo Lim**, Il Hong Suh, “*Place Recognition using Straight Lines for Vision-Based SLAM*”, 2013 IEEE International Conference on Robotics and Automation
27. Yi Wu, **Jongwoo Lim**, Ming-Hsuan Yang “*Online Object Tracking: A Benchmark*”, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2013 [acceptance rate 28.4%, 30 citations]
28. Hyon Lim, **Jongwoo Lim**, H. Jin Kim, “*Real-Time 6-DOF Monocular Visual SLAM in Large-Scale Environments*”, 2014 IEEE International Conference on Robotics and Automation, 2014 (accepted)
29. Jin Han Lee, Sehyung Lee, Guoxuan Zhang, **Jongwoo Lim**, Wan Kyun Chung, Il Hong Suh, “*Outdoor Place Recognition in Urban Environments Using Straight Lines*”, 2014 IEEE International Conference on Robotics and Automation, 2014 (accepted)

PATENTS

1. Jeffrey Ho, **Jongwoo Lim**, Ming-hsuan Yang, “*Image clustering with metric, local linear structure, and affine symmetry*”, [7,248,738] Jul 2007, [10/989,967] Nov 2004
2. Ming-hsuan Yang, **Jongwoo Lim**, David Ross, Ruei-sung Lin, “*Adaptive probabilistic visual tracking with incremental subspace update*”, [7,463,754] Dec 2008, [10/989,966] Nov 2004
3. Ming-hsuan Yang, **Jongwoo Lim**, David Ross, Takahiro Ohashi, “*Method, apparatus and program for detecting an object*”, [7,224,831] May 2007, [10/858,878] Jun 2004
4. Ming-hsuan Yang, **Jongwoo Lim**, David Ross, Takahiro Ohashi, “*Face recognition system*”, [7,430,315] Sep 2008, [10/858,930] Jun 2004

5. Ming-hsuan Yang, Ruei-sung Lin, **Jongwoo Lim**, David Ross, “*Adaptive discriminative generative model and application to visual tracking*”, [7,369,682] May 2008, [11/179,881] Jul 2005
6. **Jongwoo Lim**, Ming-hsuan Yang, “*Direct method for modeling non-rigid motion with thin plate spline transformation*”, [7,623,731] Nov 2009, [11/450,045] Jun 2006
7. **Jongwoo Lim**, Benjamin Laxton, “*Leveraging Temporal, Contextual and Ordering Constraints for Recognizing Complex Activities in Video*”, [8,165,405] Apr 2012, [11/876,724] Oct 2007
8. **Jongwoo Lim**, “*Camera-Projector Duality: Multi- Projector 3D Reconstruction*”, [8,172,407] May 2012, [12/121,056] May 2008
9. **Jongwoo Lim**, “*Optimized Projection Pattern for Long-Range Depth Sensing*”, [8,142,023] Mar 2012, [12/337,391] Dec 2008
10. Manmohan Chandraker, **Jongwoo Lim**, “*Structure and Motion with Stereo Using Lines*”, [8,401,241] Mar 2013, [12/506,560] Jul 2009
11. **Jongwoo Lim**, Vivek Pradeep, “*Egomotion Using Assorted Features*”, [13/219,184] Aug 2011
12. Rakesh Gupta, Ananth Ranganathan, **Jongwoo Lim**, “*Road Departure Warning System*”, [13/221,132] Aug 2011
13. **Jongwoo Lim**, Jan-Michael Frahm, Marc Pollefeys, “*Online Environment Mapping*”, [13/487,122] May 2012

PROFESSIONAL ACTIVITIES

* Area chair of ACCV 2014, Singapore.

* Co-organizer and lecturer of the tutorial on ‘RGBD Image Processing for 3D Modeling and Texturing’ at IICIP 2013, Melbourne, Australia.

* Local chair of ACCV 2012, Daejeon, Korea.

Conference reviewer : NIPS, CVPR, ECCV, ICCV, ACCV, ICRA, IROS and others.

Journal reviewer : IEEE Transaction of Pattern Recognition and Machine Intelligence, International Journal of Computer Vision, Computer Vision and Image Understanding, Image and Vision Computing, Pattern Recognition Letters, IEEE Transaction of Multimedia.