

Yong Jae Lee

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RESEARCH INTERESTS

My research interests are in computer vision, machine learning, and computer graphics. I am particularly interested in developing robust visual recognition systems that can meaningfully make use of the vast and ever increasing unstructured image and video content currently available with minimal human supervision.

EDUCATION

University of Texas at Austin, Austin, TX
Ph.D. in Electrical and Computer Engineering, May 2012
Thesis: “Visual Object Category Discovery in Images and Videos”
Supervised by Prof. Kristen Grauman

University of Texas at Austin, Austin, TX
M.S.E. in Electrical and Computer Engineering, August 2008
Thesis: “Foreground Focus: Finding Meaningful Features in Unlabeled Images”
Supervised by Prof. Kristen Grauman

University of Illinois at Urbana-Champaign, Champaign, IL
B.S. in Electrical Engineering (Honors), May 2006
Minor in Computer Science, Business

APPOINTMENTS

Assistant Professor July 2014-Present
University of California, Davis, Department of Computer Science

Postdoctoral Fellow
University of California, Berkeley, Department of EECS Sept 2013-June 2014
Carnegie Mellon University, Robotics Institute Aug 2012-Aug 2013
Supervised by Prof. Alexei A. Efros

Graduate Research Assistant June 2007-May 2012
University of Texas at Austin, Department of Computer Science
Supervised by Prof. Kristen Grauman

Research Intern June 2010-Sept 2010
Microsoft Research, Interactive Visual Media Group
Supervised by Dr. Larry Zitnick and Dr. Michael Cohen

AWARDS AND HONORS

- National Science Foundation Faculty Early Career Development Award (NSF CAREER), 2018
- Army Research Office Young Investigator Award (ARO YIP), 2017

- Hellman Foundation Fellowship, 2017
- Outstanding Reviewer Awards, ICCV 2013, CVPR 2015
- UT-Austin ECE dept. sole nominee for university-wide Outstanding Dissertation Award, 2012
- Doctoral Consortium Award, CVPR 2011
- Edmund J. James Scholar, Eta Kappa Nu (UIUC)

TEACHING EXPERIENCE

Faculty Instructor at UC Davis:

- ECS 289G: Visual Recognition (Graduate course). Winter 2018.
- ECS 174: Computer Vision (Undergraduate course). Spring 2017.
- ECS 289G: Visual Recognition (Graduate course). Fall 2016.
- ECS 289G: Visual Recognition (Graduate course). Fall 2015.
- ECS 189G: Intro to Computer Vision (Undergraduate course). Spring 2015.
- ECS 289H: Visual Recognition (Graduate course). Fall 2014.

Teaching Assistant at UT Austin:

- CS 376: Computer Vision (Undergraduate/Graduate course). Fall 2009, Spring 2011.

PUBLICATIONS

Books and Book Chapters

1. Fanyi Xiao and **Yong Jae Lee**. Localizing and Visualizing Relative Attributes. *Chapter in Visual Attributes*. R. Feris, C. Lampert, and D. Parikh, Editors. Springer, 2016.
2. **Yong Jae Lee**, Alexei A. Efros, and Martial Hebert. Discovering Mid-level Visual Connections in Space and Time. *Chapter in Visual Analysis and Geo-Localization of Large Scale Imagery*. A. Zamir, A. Hakeem, L. Van Gool, M. Shah, and R. Szeliski, Editors. Springer, 2016
3. Hyun Soo Park, Albert Ali Salah, **Yong Jae Lee**, Louis-Philippe Morency, Yaser Sheikh, Rita Cucchiara (Eds.). *Human Behavior Understanding*. Lecture Notes in Computer Science, Springer, 2014.

Journal Articles

1. M. Rezaur Rahman, Jinyoung Han, **Yong Jae Lee**, and Chen-Nee Chuah. Analyzing the Adoption and Cascading Process of OSN-Based Gifting Applications: An Empirical Study. *ACM Transactions on the Web (TWEB)*, Vol. 11, No. 2, April 2017.
2. **Yong Jae Lee** and Kristen Grauman. Predicting Important Objects for Egocentric Video Summarization. *International Journal of Computer Vision (IJCV)*, Vol. 114, No. 1, pp. 38-55, January 2015.

3. Jun-Yan Zhu, **Yong Jae Lee**, and Alexei A. Efros. AverageExplorer: Interactive Exploration and Alignment of Visual Data Collections. *ACM Transactions on Graphics (Proceedings of SIGGRAPH)*, Vol. 33, No. 4, July 2014.
4. **Yong Jae Lee** and Kristen Grauman. Object-Graphs for Context-Aware Visual Category Discovery. *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)*, Vol. 34, No. 2, pp. 346-358, February 2012.
5. **Yong Jae Lee**, C. Lawrence Zitnick, and Michael Cohen. ShadowDraw: Real-Time User Guidance for Freehand Drawing. *ACM Transactions on Graphics (Proceedings of SIGGRAPH)*, Vol. 30, No. 4, July 2011.
6. **Yong Jae Lee** and Kristen Grauman. Foreground Focus: Unsupervised Learning from Partially Matching Images. *International Journal of Computer Vision (IJCV)*, Vol. 85, No. 2, pp. 143-166, May 2009.

Peer Reviewed Conference Papers (acceptance rates typically ~ 2%-25%)

1. Zhongzheng Ren and **Yong Jae Lee**. Cross-Domain Self-supervised Multi-task Feature Learning using Synthetic Imagery. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Salt Lake City, UT, June 2018.
2. Wenjian Hu, Krishna Kumar Singh*, Fanyi Xiao*, Jinyoung Han, Chen-Nee Chuah, and **Yong Jae Lee**. Who Will Share My Image? Predicting the Content Diffusion Path in Online Social Networks. In *ACM International Conference on Web Search and Data Mining (WSDM)*, Los Angeles, CA, February 2018. (*equal contribution)
3. Krishna Kumar Singh and **Yong Jae Lee**. Hide-and-Seek: Forcing a Network to be Meticulous for Weakly-supervised Object and Action Localization. In *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*, Venice, Italy, October 2017.
4. Fanyi Xiao, Leonid Sigal, and **Yong Jae Lee**. Weakly-supervised Visual Grounding of Phrases with Linguistic Structures. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Honolulu, HI, June 2017.
5. Maheen Rashid, Xiuye Gu, and **Yong Jae Lee**. Interspecies Knowledge Transfer for Facial Keypoint Detection. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Honolulu, HI, June 2017.
6. Chenyou Fan, Jangwon Lee, Mingze Xu, Krishna Kumar Singh, **Yong Jae Lee**, David Crandall and Michael Ryoo. Identifying First-Person Camera Wearers in Third-Person Videos. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Honolulu, HI, June 2017.
7. Zhongzheng Ren, Adriana Noronha, Annie Vogel Ciernia, and **Yong Jae Lee**. Who Moved My Cheese? Automatic Annotation of Rodent Behaviors with Convolutional Neural Networks. In *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Santa Rosa, CA, March 2017.
8. Krishna Kumar Singh and **Yong Jae Lee**. End-to-End Localization and Ranking for Relative Attributes. In *Proceedings of the European Conference on Computer Vision (ECCV)*, Amsterdam, Netherlands, October 2016.
9. Fanyi Xiao and **Yong Jae Lee**. Track and Segment: An Iterative Unsupervised Approach for Video Object Proposals. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Las Vegas, NV, June 2016. (**spotlight presentation**, 9.7% acceptance rate)

10. Krishna Kumar Singh, Fanyi Xiao, and **Yong Jae Lee**. Track and Transfer: Watching Videos to Simulate Strong Human Supervision for Weakly-Supervised Object Detection. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Las Vegas, NV, June 2016.
11. Fanyi Xiao and **Yong Jae Lee**. Discovering the Spatial Extent of Relative Attributes. In *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*, Santiago, Chile, December 2015. (**oral presentation**, 3.3% acceptance rate)
12. Tinghui Zhou, **Yong Jae Lee**, Stella Yu, and Alexei A. Efros. FlowWeb: Joint Image Set Alignment by Weaving Consistent, Pixel-wise Correspondences. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Boston, MA, June 2015. (**oral presentation**, 3.3% acceptance rate)
13. Hyun Oh Song, **Yong Jae Lee**, Stefanie Jegelka, and Trevor Darrell. Weakly-supervised Discovery of Visual Pattern Configurations. In *Neural Information Processing Systems (NIPS)*, Montreal, Canada, December 2014.
14. **Yong Jae Lee**, Alexei A. Efros, and Martial Hebert. Style-aware Mid-level Representation for Discovering Visual Connections in Space and Time. In *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*, Sydney, Australia, December 2013. (**oral presentation**, 2.5% acceptance rate)
15. **Yong Jae Lee**, Joydeep Ghosh, and Kristen Grauman. Discovering Important People and Objects for Egocentric Video Summarization. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Providence, RI, June 2012.
16. **Yong Jae Lee**, Jaechul Kim, and Kristen Grauman. Key-Segments for Video Object Segmentation. In *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*, Barcelona, Spain, November 2011.
17. **Yong Jae Lee** and Kristen Grauman. Face Discovery with Social Context. In *Proceedings of the British Machine Vision Conference (BMVC)*, Dundee, Scotland, August 2011.
18. **Yong Jae Lee** and Kristen Grauman. Learning the Easy Things First: Self-Paced Visual Category Discovery. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Colorado Springs, CO, June 2011.
19. **Yong Jae Lee** and Kristen Grauman. Object-Graphs for Context-Aware Category Discovery. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, San Francisco, CA, June 2010. (**oral presentation**, 4.5% acceptance rate)
20. **Yong Jae Lee** and Kristen Grauman. Collect-Cut: Segmentation with Top-Down Cues Discovered in Multi-Object Images. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, San Francisco, CA, June 2010.
21. **Yong Jae Lee** and Kristen Grauman. Shape Discovery from Unlabeled Image Collections. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Miami, FL, June 2009.
22. **Yong Jae Lee** and Kristen Grauman. Foreground Focus: Finding Meaningful Features in Unlabeled Images. In *Proceedings of the British Machine Vision Conference (BMVC)*, Leeds, U.K., September 2008. (**oral presentation**, 12.5% acceptance rate)
23. Changhai Xu, **Yong Jae Lee**, and Benjamin Kuipers. Ray-based Color Image Segmentation. In *Proceedings of the Canadian Conference on Computer and Robot Vision (CRV)*, Windsor, Ontario, May 2008.

INVITED TALKS

- Center for Vision, Cognition, Learning, and Autonomy Seminar, UCLA, February 2018.
“Learning to See with Weak Human Supervision.”
- Computational Neuroscience Seminar, University of California, Davis, November 2017.
“Computer Vision for Animal Behavior Recognition.”
- Intel Labs, October 2017.
“Learning to See with Minimal Human Supervision.”
- Seoul National University, UNIST, Samsung, LG, Naver, Kakao, Korea, August 2017.
“Learning Where and How to Look for Weakly-Supervised Visual Recognition.”
- Keynote Talk, VALSE Seminar, China, April 2017.
“Learning Where and How to Look for Weakly-Supervised Visual Recognition.”
- Keynote Talk, 1st International Workshop on Human Activity Analysis with Highly Diverse Cameras, Santa Rosa, CA, March 2017.
“Hide-and-Seek: Forcing a Network to be Meticulous for Weakly-Supervised Object and Action Localization.”
- Computer Science Colloquium, Sonoma State University, September 2016.
“Attending to the Right Image Regions for Weakly-Supervised Visual Recognition.”
- Seminar, Lawrence Livermore National Laboratory, September 2016.
“Discovering the Relevant Image Regions for Weakly-Supervised Visual Recognition.”
- Machine Learning Seminar, University of California, Davis, December 2015.
“Watching Videos to Simulate Strong Human Supervision for Visual Recognition.”
- Korean Conference on Computer Vision, Seoul, Korea, August 2015.
“Interactive Exploration and Alignment of Visual Data Collections.”
- Computational Neuroscience Seminar, University of California, Davis, May 2015.
“Visual Data Mining in Image Collections.”
- Computer Science Departmental Colloquium, University of California, Davis, April 2014.
“Visual Data Mining in Image Collections.”
- Computer Science Departmental Seminar, University of Massachusetts, Amherst, March 2014.
“Visual Data Mining in Image Collections.”
- Creative Technologies Lab, Adobe Research, San Francisco, February 2014.
“Visual Data Mining in Image Collections.”
- IEEE International Conf. on Computer Vision, Sydney, Australia, December 2013.
“Style-aware Mid-level Representation for Discovering Visual Connections in Space and Time.”
- IEEE CVPR Workshop on Egocentric Vision, Providence, RI, June 2012.
“Discovering Important People and Objects for Egocentric Video Summarization.”
- Carnegie Mellon University, Robotics Institute VASC Seminar, Pittsburgh, December 2011.
“Visual Category Discovery in Images and Videos.”
- Microsoft Research, MSRNE Vision Seminar, Boston, MA, December 2011.
“Visual Category Discovery in Images and Videos.”
- ACM SIGGRAPH conference, Vancouver, Canada, August 2011.
“ShadowDraw: Real-Time User Guidance for Freehand Drawing.”

- Microsoft Research, Vision Technology (VisTech) Seminar, Redmond, WA, June 2010. “Collect-Cut: Segmentation with Top-Down Cues Discovered in Multi-Object Images.”
- IEEE Conf. on Computer Vision and Pattern Recognition, San Francisco, CA, June 2010. “Object-Graphs for Context-Aware Category Discovery.”
- British Machine Vision Conference, Leeds, U.K., September 2008. “Foreground Focus: Finding Meaningful Features in Unlabeled Images.”

PATENTS

- C. Lawrence Zitnick, Yong Jae Lee, and Michael Cohen. Realtime User Guidance for Freehand Drawing. US Patent 20,120,295,231. Granted Nov 2012.

FUNDING

- “CAREER: Weakly-Supervised Visual Scene Understanding: Combining Images and Videos, and Going Beyond Semantic Tags.” National Science Foundation, *CAREER Award*, PI. 2018-2023. \$500,499.
- “A Machine Perception Framework for Detecting Familiar and Unfamiliar Objects in Video.” Army Research Office, *Young Investigator Award*, PI. 2017-2020. \$360,000.
- “EAGER: Leveraging Synthetic Data for Visual Reasoning and Representation Learning with Minimal Human Supervision.” National Science Foundation, PI. 2017-2019. \$200,000.
- “Automatic Decoding of Pain in the Horse.” *Hellman Fellowship*, PI. 2017-2018. \$24,000.
- “Scene Understanding Research for Egocentric Vision.” Intel Labs, PI. 2016-2017. \$22,500.
- *Gift funding*. Adobe, PI. 2017. \$10,000.
- *Gift funding*. Seoho Electric, PI. 2017. \$15,000.
- *Gift funding*. Swedish Agricultural University, PI. 2016. \$33,000.
- “Big Data in Agriculture: Automated Fruit Detection in Orchards.” UC Davis, Committee on Research New Initiative/Collaborative Interdisciplinary Grant, Co-PI. 2015-2016. \$15,820.

PROFESSIONAL SERVICE ACTIVITY

- AggieMentors Science Fair Judge, UC Davis, 2016
- AggieMentors Science Fair Mentor, UC Davis, 2017-Present
- RoboPlay C-STEM Video Judge, UC Davis, 2016-Present
- Associate Editor, Journal of Visual Communication and Image Representation, 2016-Present
- Area Chair, 10th Indian Conference on Computer Vision, Graphics and Image Processing, ICVGIP 2016
- Panelist, National Science Foundation (NSF), 2016, 2017
- Panelist, Department of Energy (DOE), 2016
- Organizer, 4th Workshop on Egocentric (First-Person) Vision, CVPR 2016

- Organizer, 3rd Workshop on Egocentric (First-Person) Vision, CVPR 2014
- Organizer, 5th Workshop on Human Behavior Understanding, ECCV 2014
- Senior program committee for International Joint Conference on Artificial Intelligence (IJCAI) 2016
- Program committee for IEEE Computer Vision and Pattern Recognition (CVPR) 2011-2018
- Program committee for IEEE International Conference on Computer Vision (ICCV) 2009, 2011, 2013, 2015, 2017
- Program committee for European Conference on Computer Vision (ECCV) 2012, 2014, 2018
- Program committee for Neural Information Processing Systems (NIPS) 2015
- Program committee for Asian Conference on Computer Vision (ACCV) 2014
- Program Committee for 1st International Workshop on Egocentric Perception, Interaction and Computing (EPIC), ECCV 2016
- Program Committee for 4th Workshop on Web-scale Vision and Social Media (VSM), ECCV 2016
- Program Committee for 4th International Workshop on Large Scale Visual Recognition and Retrieval (BigVision), CVPR 2016
- Program committee for 1st Workshop on Storytelling with Images and Videos, ECCV 2014
- Program committee for International Workshop on Wearable and Ego-vision Systems for Augmented Experience, ICME 2015
- Reviewer for International Conference on Robotics and Automation (ICRA) 2016
- Reviewer for International Journal of Computer Vision (IJCV)
- Reviewer for IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)
- Reviewer for ACM SIGGRAPH
- Reviewer for ACM SIGGRAPH Asia
- Reviewer for ACM Multimedia
- Reviewer for Pacific Graphics
- Reviewer for Computer Graphics Forum
- Reviewer for IEEE Transactions on Human-Machine Systems
- Organizer for UT-Austin Vision and Learning Reading Group, 2008-2012