

Joon-Young Lee

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RESEARCH INTERESTS	<ul style="list-style-type: none">• Computer Vision & Deep Learning• Video Segmentation, Video Understanding, Video Editing	
RESEARCH EXPERIENCE	Adobe Research , San Jose, CA <i>Senior Research Scientist</i> , Deep Learning Group, Creative Intelligence Lab <i>Research Scientist</i> , Deep Learning Group, Creative Intelligence Lab <i>Research Intern</i> , Imagination Lab <i>Research Intern</i> , Imagination Lab Microsoft Research Asia , Beijing, China <i>Research Intern</i> , Visual Computing Group KAIST , Daejeon, Korea <i>Research Assistant</i> , Robotics and Computer Vision Lab,	Jul 2019 – present Oct 2015 – Jun 2019 Mar 2015 – Apr 2015 Jun 2014 – Sep 2014 Sep 2010 – Aug 2011 Mar 2008 – Sep 2015
EDUCATION	Ph.D. , Electrical Engineering, KAIST, Daejeon, Korea <i>Dissertation: Photometric Approaches for Image Enhancement and Editing</i> <i>Advisors: Prof. In So Kweon</i> M.S. , Electrical Engineering, KAIST, Daejeon, Korea <i>Advisors: Prof. In So Kweon</i> B.S. , Electronic Engineering, Yonsei University, Seoul, Korea <i>High Honors at Graduation (GPA: 4.02/4.3)</i>	Aug 2015 Aug 2009 Feb 2008
PUBLICATIONS [GOOGLE SCHOLAR] (* INDICATES EQUAL CONTRIBUTION)	<ol style="list-style-type: none">1. Adrit Rao, Jongchan Park, Sanghyun Woo, Joon-Young Lee, Oliver Aalami, “Studying the Effects of Self-Attention for Medical Image Analysis”, <i>ICCV 2021 Workshop on Computer Vision for Automated Medical Diagnosis (ICCVW-CVAMD)</i>, 20212. Hongje Seong, Seoung Wug Oh, Joon-Young Lee, Seongwon Lee, Suhyeon Lee, Euntai Kim, “Hierarchical Memory Matching Network for Video Object Segmentation”, <i>In Proc. of IEEE International Conference on Computer Vision (ICCV)</i>, 20213. Juan Carlos Leon, Fabian Caba Heilbron, Long Mai, Federico Perazzi, Joon-Young Lee, Pablo Arbelaez, Bernard Ghanem, “APES: Audiovisual Person Search in Untrimmed Video”, <i>Multimodal Learning and Applications Workshop in conjunction with CVPR 2021 (CVPRW-MULA)</i>, 20214. Sanghyun Woo, Dahun Kim, Joon-Young Lee, In So Kweon, “Learning to Associate Every Segment for Video Panoptic Segmentation”, <i>In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)</i>, 20215. Jaedong Hwang, Seoung Wug Oh, Joon-Young Lee, Bohyung Han, “Exemplar-Based Open-Set Panoptic Segmentation Network”, <i>In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)</i>, 20216. Gunhee Nam, Miran Heo, Seoung Wug Oh, Joon-Young Lee, Seon Joo Kim, “Polygonal Point Set Tracking”, <i>In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)</i>, 20217. Seoung Wug Oh, Joon-Young Lee, Ning Xu, Seon Joo Kim, “Space-time Memory Networks for Video Object Segmentation with User Guidance”, <i>IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)</i>, 2020	

8. Seonguk Seo, Joon-Young Lee, Bohyung Han, “URVOS: Unified Referring Video Object Segmentation Network with a Large-Scale Benchmark”, *In Proc. of European Conference on Computer Vision (ECCV)*, 2020
9. Shubham Agarwal, Trung Bui, Joon-Young Lee, Ioannis Konostas, Verena Rieser, “History for Visual Dialog: Do we really need it?”, *In Proc. of Annual Meeting of the Association for Computational Linguistics (ACL)*, 2020
10. Dahun Kim, Sanghyun Woo, Joon-Young Lee, In So Kweon, “Video Panoptic Segmentation”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020
11. Juan Leon, Fabian Caba, Long Mai, Federico Perazzi, Joon-Young Lee, Pablo Arbelaez, Bernard Ghanem, “Active Speakers in Context”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020
12. Zijun Wei, Jianming Zhang, Zhe Lin, Joon-Young Lee, Niranjana Balasubramanian, Minh Hoai Nguyen, Dimitris Samaras, “Learning Visual Emotion Representations from Web Data”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020
13. Jongchan Park*, Sanghyun Woo*, Joon-Young Lee, In-So Kweon, “A Simple and Light-weight Attention Module for Convolutional Neural Networks”, *International Journal of Computer Vision (IJCV)*, 2020
14. Dahun Kim*, Sanghyun Woo*, Joon-Young Lee, In So Kweon, “Recurrent Temporal Aggregation Framework for Deep Video Inpainting”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, 2020
15. Seoung Wug Oh, Joon-Young Lee, Ning Xu, Seon Joo Kim, “Video Object Segmentation using Space-Time Memory Networks”, *In Proc. of IEEE International Conference on Computer Vision (ICCV)*, 2019 (**Oral**)
16. Seoung Wug Oh, Sungho Lee, Joon-Young Lee, Seon Joo Kim, “Onion-Peel Networks for Deep Video Completion”, *In Proc. of IEEE International Conference on Computer Vision (ICCV)*, 2019
17. Xin Ye, Zhe Lin, Joon-Young Lee, Jianming Zhang, Shibin Zheng, Yezhou Yang, “GAPLE: Generalizable Approaching Policy LEarning for Robotic Object Searching in Indoor Environment”, *IEEE Robotics and Automation Letters (RA-L, Proc. of IROS)*, 2019
18. Xingyu Liu, Joon-Young Lee, Hailin Jin, “Learning Video Representations from Correspondence Proposals”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019 (**Oral**)
19. Seoung Wug Oh, Joon-Young Lee, Ning Xu, Seon Joo Kim, “Fast User-Guided Video Object Segmentation by Interaction-and-Propagation Networks”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019
20. Dahun Kim*, Sanghyun Woo*, Joon-Young Lee, In So Kweon, “Deep Video Inpainting”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019
21. Dahun Kim*, Sanghyun Woo*, Joon-Young Lee, In So Kweon, “Deep Blind Video Decaptioning by Temporal Aggregation and Recurrence”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019
22. Jiyoung Jung, Joon-Young Lee, In So Kweon, “One-Day Outdoor Photometric Stereo Using Skylight Estimation”, *International Journal of Computer Vision (IJCV)*, 2019
23. Youngbae Hwang, Joon-Young Lee, In So Kweon, and Seon Joo Kim, “Probabilistic Moving Least Squares with Spatial Constraints for Nonlinear Color Transfer Between Images”, *Computer Vision and Image Understanding (CVIU)*, 2019
24. Sanghyun Woo*, Jongchan Park*, Joon-Young Lee, In So Kweon, “CBAM: Convolutional Block Attention Module”, *In Proc. of European Conference on Computer Vision (ECCV)*, 2018

25. Fabian Caba, Joon-Young Lee, Hailin Jin, Bernard Ghanem, “What do I Annotate Next? An Empirical Study of Active Learning for Action Localization”, *In Proc. of European Conference on Computer Vision (ECCV)*, 2018
26. Rameswar Panda, Jianming Zhang, Haoxiang Li, Joon-Young Lee, Xin Lu, Amit K. Roy-Chowdhury, “Contemplating Visual Emotions: Understanding and Overcoming Dataset Bias”, *In Proc. of European Conference on Computer Vision (ECCV)*, 2018
27. Wei-Chih Hung, Jianming Zhang, Xiaohui Shen, Zhe Lin, Joon-Young Lee, Ming-Hsuan Yang, “Learning to Blend Photos”, *In Proc. of European Conference on Computer Vision (ECCV)*, 2018
28. Inwook Shim, Tae-Hyun Oh, Joon-Young Lee, Dong-Geol Choi, Jinwook Choi, and In So Kweon, “Gradient-based Camera Exposure Control for Outdoor Mobile Platforms”, *IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)*, 2018
29. Jongchan Park*, Sanghyun Woo*, Joon-Young Lee, In So Kweon, “BAM: Bottleneck Attention Module”, *In Proc. of British Machine Vision Conference (BMVC)*, 2018 (**Oral**)
30. Seoung Wug Oh, Joon-Young Lee, Kalyan Sunkavalli, Seon Joo Kim, “Fast Video Object Segmentation by Reference-Guided Mask Propagation”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2018 (**Spotlight**)
31. Jongchan Park, Joon-Young Lee, Donggeun Yoo, In So Kweon, “Distort-and-Recover: Color Enhancement using Deep Reinforcement Learning”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2018
32. Gyeongmin Choe, Seong-Heum Kim, Sunghoon Im, Joon-Young Lee, Srinivasa Narasimhan, and In So Kweon. “RANUS: RGB and NIR Urban Scene Dataset for Deep Scene Parsing”, *IEEE Robotics and Automation Letters (RA-L)*, 2018
33. Zhuo Hui, Kalyan Sunkavalli, Joon-Young Lee, Sunil Hadap, Jian Wang, Aswin C. Sankaranarayanan, “Reflectance Capture using Univariate Sampling of BRDFs”, *In Proc. of IEEE International Conference on Computer Vision (ICCV)*, 2017
34. Xuaner Zhang, Joon-Young Lee, Kalyan Sunkavalli, and Zhaowen Wang, “Photometric Stabilization for Fast-forward Videos”, *Computer Graphics Forum (CGF, Proc of Pacific Graphics)*, Volume 36, Number 7, Pages 105-113, 2017
35. Yinda Zhang*, Shuran Song*, Ersin Yumer, Manolis Savva, Joon-Young Lee, Hailin Jin, Thomas Funkhouser, “Physically-Based Rendering for Indoor Scene Understanding Using Convolutional Neural Networks”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017
36. Hao Hu, Zhaowen Wang, Joon-Young Lee, Zhe Lin, Guo-Jun Qi, “Temporal Domain Neural Encoder for Video Representation Learning”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2017
37. Jinwoong Jung, Beomseok Kim, Joon-Young Lee, Byungmoon Kim, Seungyong Lee, “Robust Upright Adjustment of 360 Spherical Panoramas”, *The Visual Computer Journal (TVCI, Proc. Computer Graphics International)*, Volume 33, Number 6–8, Pages 737–747, 2017
38. Jinwoong Jung, Joon-Young Lee, Byungmoon Kim, and Seungyong Lee, “Upright Adjustment of 360 Spherical Panoramas”, *IEEE Virtual Reality (VR)* (Poster), 2017
39. Hae-Gon Jeon, Joon-Young Lee, Yudeog Han, Seon Joo Kim, and In So Kweon, “Generating Fluttering Pattern with Low Autocorrelation for Coded Exposure Imaging”, *International Journal of Computer Vision (IJCV)*, Volume 123, Number 2, Pages 269–286, 2017
40. Youngjin Yoon, Hae-Gon Jeon, Donggeun Yoo, Joon-Young Lee, and In So Kweon, “Light Field Image Super-Resolution using Convolutional Neural Network”, *IEEE Signal Processing Letters (SLP)*, Volume 24, Number 6, Pages 848–852, 2017

41. Hae-Gon Jeon, Joon-Young Lee, Yudeog Han, Seon Joo Kim, and In So Kweon, "Multi-Image Deblurring using Complementary Sets of Fluttering Patterns", *IEEE Transactions on Image Processing (TIP)*, Volume 26, Number 5, Pages 2311–2326, 2017
42. Seong-Heum Kim, Yu-Wing Tai, Joon-Young Lee, Jaesik Park, and In So Kweon, "Category-specific Salient View Selection via Deep Convolutional Neural Networks", *Computer Graphics Forum (CGF)*, Volume 36, Number 8, Pages 313–328, 2017
43. Youngjin Yoon, Gyeongmin Choe, Namil Kim, Joon-Young Lee, and In So Kweon, "Fine-scale Surface Normal Estimation using a Single NIR Image", *In Proc. of European Conference on Computer Vision (ECCV)*, 2016
44. Joon-Young Lee, Kalyan Sunkavalli, Zhe Lin, Xiaohui Shen, and In So Kweon, "Automatic Content-Aware Color and Tone Stylization", *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016 (**Spotlight**)
45. Hae-Gon Jeon, Joon-Young Lee, Sunghoon Im, Hyowon Ha, and In So Kweon, "Stereo Matching with Color and Monochrome Cameras in Low-light Conditions", *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016
46. Inwook Shim, Seunghak Shin, Yunsu Bok, Kyungdon Joo, Dong-Geol Choi, Joon-Young Lee, Jaesik Park, Jun-Ho Oh, and In So Kweon, "Vision System and Depth Processing for DRC-HUBO+", *In Proc. of IEEE International Conference on Robotics and Automation (ICRA)*, 2016
47. Donggeun Yoo, Sunggyun Park, Joon-Young Lee, Anthony Paek, and In So Kweon, "AttentionNet: Aggregating Weak Directions for Accurate Object Detection", *In Proc. of IEEE International Conference on Computer Vision (ICCV)*, 2015
48. Hae-Gon Jeon, Joon-Young Lee, Yudeog Han, Seon Joo Kim, and In So Kweon, "Complementary Sets of Shutter Sequences for Motion Deblurring", *In Proc. of IEEE International Conference on Computer Vision (ICCV)*, 2015
49. Youngjin Yoon, Hae-Gon Jeon, Donggeun Yoo, Joon-Young Lee, and In So Kweon, "Learning a Deep Convolutional Network for Light-Field Image Super-Resolution", *In Proc. of IEEE International Conference on Computer Vision Workshops (ICCVW)*, 2015
50. Jiyoung Jung, Joon-Young Lee, Yekeun Jeong, and In So Kweon, "Time-of-flight sensor calibration for a color and depth camera pair", *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, Volume 37, Number 7, Pages 1501–1513, 2015
51. Tae-Hyun Oh, Joon-Young Lee, Yu-Wing Tai, and In So Kweon, "Robust High Dynamic Range Imaging by Rank Minimization", *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, Volume 37, Number 6, Pages 1219–1232, 2015
52. Jiyoung Jung, Joon-Young Lee, and In So Kweon, "One-day outdoor photometric stereo via skylight estimation", *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2015 (**Oral**)
53. Donggeun Yoo, Sunggyun Park, Joon-Young Lee, and In So Kweon, "Multi-scale Pyramid Pooling for Deep Convolutional Representation", *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2015
54. Kibaek Park, Seunghak Shin, Hae-Gon Jeon, Joon-Young Lee, and In So Kweon, "Motion Deblurring using Coded Exposure for a Wheeled Mobile Robot", *In Proc. of International Conference on Ubiquitous Robots and Ambient Intelligence (URAI)*, 2014
55. Yukyung Choi, Chaehoon Park, Joon-Young Lee, and In So Kweon, "Robust Binary Feature using the Intensity Order", *In Proc. of Asian Conference on Computer Vision (ACCV)*, 2014
56. Inwook Shim, Joon-Young Lee, and In So Kweon, "Auto-adjusting Camera Exposure for Outdoor Robotics using Gradient Information", *In Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2014

57. Youngbae Hwang*, Joon-Young Lee*, In So Kweon, and Seon Joo Kim, “Color Transfer using Probabilistic Moving Least Squares”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2014
58. Jiyoung Jung, Joon-Young Lee, and In So Kweon, “Noise aware depth denoising for a time-of-flight camera”, *In Proc. of Korea-Japan Joint Workshop on Frontiers of Computer Vision (FCV)*, 2014
59. Yudeog Han, Joon-Young Lee, and In So Kweon, “High Quality Shape from a Single RGB-D Image under Uncalibrated Natural Illumination”, *In Proc. of IEEE International Conference on Computer Vision (ICCV)*, 2013
60. Hae-Gon Jeon, Joon-Young Lee, Yudeog Han, Seon Joo Kim, and In So Kweon, “Fluttering Pattern Generation using Modified Legendre Sequence for Coded Exposure Imaging”, *In Proc. of IEEE International Conference on Computer Vision (ICCV)*, 2013
61. Joon-Young Lee, Jiyoung Jung, Yunsu Bok, Jaesik Park, Dong-Geol Choi, Yudeog Han, and In So Kweon, “Robust Computer Vision Techniques for High-quality 3D Modeling”, *In Proc. of IAPR Asian Conference on Pattern Recognition (ACPR)*, 2013
62. Tae-Hyun Oh, Joon-Young Lee, and In So Kweon, “High Dynamic Range Imaging by a Rank-1 Constraint”, *In Proc. of IEEE International Conference on Image Processing (ICIP)*, 2013
63. Joon-Young Lee, Yasuyuki Matsushita, Boxin Shi, In So Kweon, and Katsushi Ikeuchi, “Radiometric Calibration by Rank Minimization”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, Volume 35, Number 1, Pages 144–156, 2013
64. Tae-Hyun Oh, Joon-Young Lee, and In So Kweon, “Real-Time Motion Detection based on Discrete Cosine Transform”, *In Proc. of IEEE International Conference on Image Processing (ICIP)*, 2012
65. Jaesik Park, Joon-Young Lee, Yu-Wing Tai, and In So Kweon, “Modeling Photo Composition and Its Application to Photo Re-arrangement”, *In Proc. of IEEE International Conference on Image Processing (ICIP)*, 2012
66. Joon-Young Lee, Boxin Shi, Yasuyuki Matsushita, In So Kweon, and Katsushi Ikeuchi, “Radiometric Calibration by Transform Invariant Low-rank Structure”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2011
67. Jiyoung Jung, Yekeun Jeong, Joon-Young Lee, Hanbyul Joo, and In So Kweon, “View-invariant Planar Object Detection for VisTRo”, *In Proc. of International Conference on Ubiquitous Robots and Ambient Intelligence (URAI)*, 2010
68. Jiyoung Jung, Yekeun Jeong, Joon-Young Lee, and In So Kweon, “Image Warping for View-invariant Object Matching using Stereo Camera”, *In Proc. of Korea-Japan Joint Workshop on Frontiers of Computer Vision (FCV)*, 2010

HONORS & AWARDS

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|---|---------------------|
| • 2021 Tech Excellence Award, Adobe | Jun 2021 |
| • Outstanding Reviewer in CVPR 2021 | Jun 2021 |
| • 1st (interactive track) / 4th (semi-supervised track) in the DAVIS Challenge 2019 | Jun 2019 |
| • GTC 2019 Top Poster Award | Mar 2019 |
| • Adobe MAX 2018 Sneak Demo [video link] | Oct 2018 |
| • 1st Place Award in ChalearnLAP Inpainting Challenge Track 2 – video decaptioning | Sep 2018 |
| • 1st Place Award in The Interactive DAVIS Challenge 2018 | Jun 2018 |
| • Best poster award, The 9th International Workshop on Robust Computer Vision | Dec 2014 |
| • Research Highlights of the year (2013), KAIST | Mar 2014 |
| • Qualcomm Innovation Award | Sep 2013 |
| • Research Highlights of the year (2012), KAIST | Mar 2013 |
| • Silver prize, 19th HumanTech Paper Award, Samsung Electronics Co., Ltd. | Feb 2013 |
| • Excellent intern award, Microsoft Research Asia | Aug 2011 |
| • High Honors at Graduation, Yonsei University | Feb 2008 |
| • Full scholarship, Jeongsu Scholarship Foundation | Mar 2006 – Feb 2008 |
| • Full scholarship, Yonsei Univerisity | Mar 2005 – Feb 2006 |

**MEMBERSHIP &
SERVICE**

Area Chair

- The British Machine Vision Conference (BMVC), 2021
- European Conference on Computer Vision (ECCV), 2020
- IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2020
- International Conference on Computer Vision (ICCV), 2019

Organizer

- Large-scale Video Object Segmentation Challenge Workshop in conjunction with CVPR 2021

Reviewer

- Conference: CVPR (2016–), ICCV (2015–), ECCV (2016–), SIGGRAPH (2018), SIGGRAPH ASIA (2018), 3DV (2015, 2016), ACCV (2016), PG (2015), WACV (2015, 2016), ICRA (2017, 2019), IROS (2016)
- Journal: TPAMI, IJCV, TIP, CVIU

IEEE student member (2010–2015), IEEE member (2016–Present)

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