Joon-Young Lee

CONTACT
INFORMATION

Adobe
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RESEARCH
INTERESTS

- Computer Vision & Deep Learning
- Video Segmentation, Video Understanding, Video Editing

RESEARCH
EXPERIENCE

Adobe Research, San Jose, CA
Senior Research Scientist, Deep Learning Group, Creative Intelligence Lab   Jul 2019 – present
Research Scientist, Deep Learning Group, Creative Intelligence Lab   Oct 2015 – Jun 2019
Research Intern, Imagination Lab   Mar 2015 – Apr 2015
Research Intern, Imagination Lab   Jun 2014 – Sep 2014

Microsoft Research Asia, Beijing, China
Research Intern, Visual Computing Group   Sep 2010 – Aug 2011

KAIST, Daejeon, Korea
Research Assistant, Robotics and Computer Vision Lab,   Mar 2008 – Sep 2015

EDUCATION

Ph.D., Electrical Engineering, KAIST, Daejeon, Korea   Aug 2015
Dissertation: Photometric Approaches for Image Enhancement and Editing
Advisors: Prof. In So Kweon

M.S., Electrical Engineering, KAIST, Daejeon, Korea   Aug 2009
Advisors: Prof. In So Kweon

B.S., Electronic Engineering, Yonsei University, Seoul, Korea   Feb 2008
High Honors at Graduation (GPA: 4.02/4.3)

PUBLICATIONS

(* INDICATES EQUAL
CONTRIBUTION)

[GOOGLE SCHOLAR]

1. Sanghyun Woo, Dahun Kim, Joon-Young Lee, In So Kweon, "Learning to Associate Every Segment for Video Panoptic Segmentation", *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2021

2. Jaedong Hwang, Seoung Wug Oh, Joon-Young Lee, Bohyung Han, "Exemplar-Based Open-Set Panoptic Segmentation Network", *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2021

3. Gunhee Nam, Miran Heo, Seoung Wug Oh, Joon-Young Lee, Seon Joo Kim, "Polygonal Point Set Tracking", *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2021

4. Seoung Wug Oh, Joon-Young Lee, Ning Xu, Seon Joo Kim, "Space-time Memory Networks for Video Object Segmentation with User Guidance", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**), 2020

5. 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

6. Shubham Agarwal, Trung Bui, Joon-Young Lee, Ioannis Konstas, Verena Rieser, "History for Visual Dialog: Do we really need it?", *In Proc. of Annual Meeting of the Association for Computational Linguistics* (**ACL**), 2020

7. 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

8. 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

9. Zijun Wei, Jianming Zhang, Zhe Lin, Joon-Young Lee, Niranjan 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

10. 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

11. 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

12. 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**)

13. 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

14. 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

15. 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**)

16. 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

17. 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

18. 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

19. Jiyoung Jung, Joon-Young Lee, In So Kweon, "One-Day Outdoor Photometric Stereo Using Skylight Estimation", *International Journal of Computer Vision* (**IJCV**), 2019

20. 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

21. 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

22. 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

23. 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

24. 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

25. 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

26. Jongchan Park*, Sanghyun Woo*, Joon-Young Lee, In So Kweon, "BAM: Bottleneck Attention Module", *In Proc. of British Machine Vision Conference* (**BMVC**), 2018 (**Oral**)

27. 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**)

28. 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

29. 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

30. 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

31. 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

32. 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

33. Hao Hu, Zhaowen Wang, Joon-Young Lee, Zhe Lin, Guo-Jun Qi, "Temporal Domain Neural Encoder for Video Representation Learning", *IEEE Conference on Computer Vision and Pattern Recognition Workshops* (**CVPRW**), 2017

34. Jinwoong Jung, Beomseok Kim, Joon-Young Lee, Byungmoon Kim, Seungyong Lee, "Robust Upright Adjustment of 360 Spherical Panoramas", *The Visual Computer Journal* (**TVCJ**, Proc. Computer Graphics International), Volume 33, Number 6–8, Pages 737–747, 2017

35. Jinwoong Jung, Joon-Young Lee, Byungmoon Kim, and Seungyong Lee, "Upright Adjustment of 360 Spherical Panoramas", *IEEE Virtual Reality* (**VR**) (Poster), 2017

36. 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

37. 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

38. 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

39. 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

40. 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

41. 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**)

42. 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

43. 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

44. 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

45. 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

46. 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

47. 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

48. 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

49. 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**)

50. 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

51. 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

52. 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

53. 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

54. 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

55. 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

56. 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

57. 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

58. 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

59. 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

60. 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

61. 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

62. 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

63. 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

64. 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

65. 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

- 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
- 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)