Joon-Young Lee

CONTACT INFORMATION

Adobe Systems Incorporated
345 Park Ave, E7-419
San Jose, CA 95110

https://joonyoung-cv.github.io/
jolee@adobe.com

RESEARCH INTERESTS

- Deep Learning
- Computer Vision
- Image/Video enhancement
- Computational photography

EDUCATION

KAIST, Daejeon, Korea

Ph.D., Electrical Engineering, Aug 2015

- Dissertation: Photometric Approaches for Image Enhancement and Editing
- Advisors: Prof. In So Kweon

M.S., Electrical Engineering, Aug 2009

- Advisor: Prof. In So Kweon

Yonsei University, Seoul, Korea

B.S., Electrical & Electronic Engineering, Feb 2008

- *High Honors at Graduation* (GPA: 4.02/4.3)

RESEARCH EXPERIENCE

Adobe Research, San Jose, CA
Research Scientist, Imagination Lab — Oct 2015 – present

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

Adobe Systems, San Jose, CA
Research Intern, Imagination Lab — Jun 2014 – Sep 2014, Mar 2015 – Apr 2015

Korea Electronics Technology Institute (KETI), Korea
(Part-time) Research Intern, Multimedia IP Research Center — Apr 2013 – May 2014

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

PUBLICATIONS

International Journal

1. 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**), accepted

2. 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**), accepted

3. 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* (**RAL**), in press

4. 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

5. 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

6. 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

7. 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

8. 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

9. 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

10. 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

11. 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

12. **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

International Conference

1. 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

2. 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

3. 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

4. Jongchan Park*, Sanghyun Woo*, Joon-Young Lee, In So Kweon, "Convolutional Block Attention Module", *In Proc. of European Conference on Computer Vision* (**ECCV**), 2018 (* equal contribution)

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

6. 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**)

7. 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

8. Zhuo Hui, Kalyan Sunkavalli, **Joon-Young Lee**, Sunil Hadap, Jian Wang, Aswin C. Sankaranarayanan, "Reflectance Capture using Univariate Sampling of BRDFs", *IEEE International Conference on Computer Vision* (**ICCV**), 2017

9. 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", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2017 (* equal contribution)

10. 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-DV**), 2017

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

12. 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

13. **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**)

14. 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

15. 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

16. 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

17. 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

18. 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

19. 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**)

20. 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

21. 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

22. 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 (* equal contribution)

23. 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

24. 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 (* equal contribution)

25. 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

26. 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

27. 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

28. **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

29. 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

30. 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

31. 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

32. **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

33. 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

34. 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

- 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

INDUSTRIAL EXPERIENCE

SinziNET. Co., Ltd.
Software engineer — Sep 2004 – Jan 2005

ATOP Information & Technology Co., Ltd.
Software engineer — Aug 2001 – Jul 2004
- Working at the company as an alternative to mandatory military duty

Timespace system Co., Ltd.
Software engineer — Jan 2001 – Aug 2001

IT SKILLS

- Extensive software experience in computer vision and signal processing (image, video)
- Languages: C, C++, MATLAB, Python, Lua, LaTeX, Java, PHP, HTML, MySQL
- Libraries: PyTorch, Torch, Tensorflow, OpenCV, OpenGL, and others

REFERENCES Available upon request.

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