

# Seungryong Kim's Curriculum Vitae

Ph.D. Candidate, Digital Image Media Laboratory (DIML), Yonsei University, Seoul, Korea

## CONTACT INFORMATION

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Homepage: <http://diml.yonsei.ac.kr/~srkim/>

## RESEARCH INTEREST

2-D/3-D Computer Vision, Computational Photography, Machine Learning  
Deep Learning, Convolutional Neural Networks, Recurrent Neural Networks  
Continuous and Discrete Optimization, Sparse Representation  
Sparse and Dense Visual Correspondence and Its Applications  
Multi-Sensor and Multi-spectral Computer Vision  
3-D Reconstruction, 3-D Modeling

## EDUCATION

**Ph.D.** Candidate in Electrical and Electronic Engineering Mar. 2012 – Present  
**Yonsei University**, Seoul, Korea  
Supervised by Prof. Kwanghoon Sohn  
GPA: 4.2/4.3

**Research Intern** in Internet Graphics Group Sep. 2015 – Feb. 2016  
**Microsoft Research Asia**, Beijing, China  
Supervised by Dr. Steve Lin

**B.S.** in Electrical and Electronic Engineering Mar. 2008 – Feb. 2012  
**Yonsei University**, Seoul, Korea  
Graduated *Cum Laude*  
GPA: 3.95/4.3

## PUBLICATION

### International Journal

1. Sunok Kim, Dongbo Min, **Seungryong Kim**, and Kwanghoon Sohn, "Feature Augmentation for Learning Confidence Measure in Stereo Matching," *IEEE Trans. on Image Processing (TIP)*, vol. 26, no. 12, pp. 6019-6033, Dec. 2017.  
(5-year Impact Factor: **6.127**)
2. **Seungryong Kim**, Dongbo Min, Bumsub Ham, Minh N. Do, and Kwanghoon Sohn, "DASC: Robust Dense Descriptor for Multi-modal and Multi-spectral Correspondence Estimation," *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)*, vol. 39, no. 9, pp. 1712-1729, Sep. 2017.  
(5-year Impact Factor: **12.290**)
3. **Seungryong Kim**, Rui Cai, Kihong Park, Sunok Kim, and Kwanghoon Sohn, "Modality-Invariant Image Classification Based on Modality Uniqueness and Dictionary Learning," *IEEE Trans. on Image Processing (TIP)*, vol. 26, no. 2, pp. 884-899, Feb. 2017.  
(5-year Impact Factor: **6.127**)
4. Seungchul Ryu, **Seungryong Kim**, and Kwanghoon Sohn, "Local Area Transform for Cross Modal Correspondence Matching," *Pattern Recognition (PR)*, vol. 63, pp. 218-228, Mar. 2017.  
(5-year Impact Factor: **4.991**)
5. Jongin Son, **Seungryong Kim**, and Kwanghoon Sohn, "Fast Illumination-Robust Foreground Detection Using Hierarchical Distribution Map for Real-time Video Surveillance System," *Expert Systems With Applications (ESWA)*, vol. 66, no. 30, pp. 32-41, Dec. 2016.  
(5-year Impact Factor: **3.526**)
6. Jongin Son, **Seungryong Kim**, Sanghoon Kim and Kwanghoon Sohn, "A Multi-Vision Sensor-based Fast Localization System with Image Matching in Challenging Outdoor Environments," *Expert Systems With Applications (ESWA)*, vol. 42, no. 22, pp. 8830-8839, Dec. 2015.  
(5-year Impact Factor: **3.526**)
7. **Seungryong Kim**, Bumsub Ham, Bongjoe Kim, and Kwanghoon Sohn, "Mahalanobis Distance Cross-Correlation for Illumination Invariant Stereo Matching," *IEEE Trans. on Circuits and Systems for Video Technology (TCSVT)*, vol. 24, no. 12, pp. 3839-3860, Dec. 2014.  
(5-year Impact Factor: **4.552**)
8. **Seungryong Kim**, Dongbo Min, Bumsub Ham, Stephen Lin, and Kwanghoon Sohn, "FCSS: Fully

Convolutional Self-Similarity for Dense Semantic Correspondence," *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)*. (Accepted)  
(5-year Impact Factor: **12.290**)

International  
Journal  
(Under Review)

1. Kihong Park, **Seungryong Kim**, and Kwanghoon Sohn, "Unified Multi-spectral Pedestrian Detection Based on Probabilistic Fusion Networks," *Pattern Recognition (PR)*. (Under Minor Revision)  
(5-year Impact Factor: **4.991**)
2. **Seungryong Kim**, Dongbo Min, Stephen Lin, and Kwanghoon Sohn, "Discrete-Continuous Transformation Matching for Dense Semantic Correspondence," *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)*. (Under Review)  
(5-year Impact Factor: **12.290**)

International  
Conference

1. Sangryul Jeon, **Seungryong Kim**, Dongbo Min, and Kwanghoon Sohn, "Pyramidal Affine Regression Networks for Dense Semantic Correspondence," 2018. (submitted)
2. Sungil Choi, **Seungryong Kim**, Kihong Park, and Kwanghoon Sohn, "Learning Feature and Confidence for Multi-view Stereo Matching," in *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2018. (submitted)
3. Jiyoung Lee, Sunok Kim, **Seungryong Kim**, and Kwanghoon Sohn, "Spatiotemporal Attention Based Deep Neural Networks for Emotion Recognition," in *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2018. (Accepted)
4. Kihong Park, **Seungryong Kim**, and Kwanghoon Sohn, "High-precision Depth Estimation with the 3D LiDAR and Stereo Fusion," in *Proc. IEEE International Conference on Robotics and Automation (ICRA)*, 2018. (Accepted)
5. **Seungryong Kim**, Dongbo Min, Stephen Lin, and Kwanghoon Sohn, "DCTM: Discrete-Continuous Transformation Matching for Semantic flow," in *Proc. IEEE International Conference on Computer Vision (ICCV)*, Oct. 2017. (**Oral Presentation**)
6. Kihong Park, **Seungryong Kim**, and Kwanghoon Sohn, "Pedestrian Proposal Generation Using Depth-Aware Scale Estimation," in *Proc. IEEE International Conference on Image Processing (ICIP)*, Sep. 2017.
7. Sangryul Jeon, **Seungryong Kim**, and Kwanghoon Sohn, "Convolutional Feature Pyramid Fusion via Attention Network," in *Proc. IEEE International Conference on Image Processing (ICIP)*, Sep. 2017.
8. Somi Jeong, **Seungryong Kim**, Bumsub Ham, and Kwanghoon Sohn, "Convolutional Cost Aggregation for Robust Stereo Matching," in *Proc. IEEE International Conference on Image Processing (ICIP)*, Sep. 2017.
9. Sunghun Joung, **Seungryong Kim**, Bumsub Ham, and Kwanghoon Sohn, "Unsupervised Stereo Matching Using Correspondence Consistency," in *Proc. IEEE International Conference on Image Processing (ICIP)*, Sep. 2017.
10. Sungil Choi, **Seungryong Kim**, Kihong Park, and Kwanghoon Sohn, "Multi-Spectral Human Co-Segmentation via Joint Convolutional Neural Networks," in *Proc. IEEE International Conference on Image Processing (ICIP)*, Sep. 2017.
11. Sunok Kim, Dongbo Min, Bumsub Ham, **Seungryong Kim**, and Kwanghoon Sohn, "Deep Stereo Confidence Prediction for Depth Estimation," in *Proc. IEEE International Conference on Image Processing (ICIP)*, Sep. 2017.
12. **Seungryong Kim**, Dongbo Min, Bumsub Ham, Sangryul Jeon, Stephen Lin, and Kwanghoon Sohn, "FCSS: Fully Convolutional Self-Similarity for Dense Semantic Correspondence," in *Proc. IEEE Conf. Computer Vision Pattern Recognition (CVPR)*, Jul. 2017. (**29%** acceptance rate)
13. Kihong Park, **Seungryong Kim**, and Kwanghoon Sohn, "Homography Flow for Dense Correspondences," in *Proc. Asia-Pacific Signal and Information Processing Association Conference (APSIPA)*, Dec. 2016.
14. **Seungryong Kim**, Kihong Park, Kwanghoon Sohn, and Stephen Lin, "Unified Depth Prediction and Intrinsic Image Decomposition from a Single Image via Joint Convolutional Neural Fields," in *Proc. European Conference on Computer Vision (ECCV)*, Oct. 2016. (**Spotlight Presentation**) (**4.7%** acceptance rate)
15. **Seungryong Kim**, Dongbo Min, Stephen Lin, and Kwanghoon Sohn, "Deep Self-Convolutional Descriptor for Dense Cross-modal Correspondence," in *Proc. European Conference on Computer*

*Vision (ECCV)*, Oct. 2016. (26.6% acceptance rate)

16. Hangil Choi, **Seungryong Kim**, Kihong Park, and Kwanghoon Sohn, "Multi-spectral Pedestrian Detection Based on Accumulated Object Proposal with Fully Convolution Network," in *Proc. IEEE International Conference on Pattern Recognition (ICPR)*, Dec. 2016.
17. **Seungryong Kim**, Dongbo Min, and Kwanghoon Sohn, "ANCC Flow: Adaptive Normalized Cross-Correlation with Evolving Guidance Aggregation for Dense Correspondence Estimation," in *Proc. IEEE International Conference on Image Processing (ICIP)*, Sep. 2016.
18. Sungil Choi, **Seungryong Kim**, Kihong Park, and Kwanghoon Sohn, "Multilevel Segment Based Dense Correspondence: An Affine Transformation Approach," in *Proc. Electronic Imaging (EI)*, Feb. 2016.
19. Kihong Park, **Seungryong Kim**, Seungchul Ryu, and Kwanghoon Sohn, "Randomized Global Transformation Approach for Dense Correspondence," in *Proc. British Machine Vision Conference (BMVC)*, Sep. 2015. (33.6% acceptance rate)
20. Jongin Son, **Seungryong Kim**, and Kwanghoon Sohn, "Fast Affine-invariant Image Matching Based on Global Bhattacharyya Measure with Adaptive Tree," in *Proc. IEEE International Conference on Image Processing (ICIP)*, Sep. 2015.
21. **Seungryong Kim**, Dongbo Min, Bumsub Ham, Seungchul Ryu, Minh N. Do, and Kwanghoon Sohn, "DASC: Dense Adaptive Self-Correlation Descriptor for Multi-modal and Multi-spectral Correspondence," in *Proc. IEEE Conf. Computer Vision Pattern Recognition (CVPR)*, Jun. 2015. (28.4% acceptance rate)
22. Kihong Park, Seungchul Ryu, **Seungryong Kim**, and Kwanghoon Sohn, "Statistical Approach for Supervised Codeword Selection," in *Proc. Electronic Imaging (EI)*, Feb. 2015.
23. Junhyung Kim, Seungchul Ryu, **Seungryong Kim**, and Kwanghoon Sohn, "Robust Stereo Matching Based on Probabilistic Laplacian Propagation with Weighted Mutual Information," in *Proc. Electronic Imaging (EI)*, Feb. 2015.
24. **Seungryong Kim**, Bumsub Ham, Seungchul Ryu, Seon Joo Kim, and Kwanghoon Sohn, "Robust Stereo Matching Using Probabilistic Laplacian Surface Propagation," in *Proc. Asian Conference on Computer Vision (ACCV)*, Nov. 2014. (27.9% acceptance rate)
25. **Seungryong Kim**, Seungchul Ryu, Bumsub Ham, Junhyung Kim, and Kwanghoon Sohn, "Local Self-Similarity Frequency Descriptor for Multispectral Feature Matching," in *Proc. IEEE International Conference on Image Processing (ICIP)*, Oct. 2014.
26. Seungchul Ryu, **Seungryong Kim**, and Kwanghoon Sohn, "Synthesis Quality Prediction Model Based on Distortion Intolerance," in *Proc. IEEE International Conference on Image Processing (ICIP)*, Oct. 2014.
27. **Seungryong Kim**, Hunjae Yoo, Seungchul Ryu, Bumsub Ham, and Kwanghoon Sohn, "ABFT: Anisotropic Binary Feature Transform Based on Structure Tensor Space," in *Proc. IEEE International Conference on Image Processing (ICIP)*, Oct. 2013. (Top 10% of accepted paper)
28. **Seungryong Kim**, Hunjae Yoo, and Kwanghoon Sohn, "Robust Corner Detector Based on Corner Candidate Region," in *Proc. IEEE Conference on Industrial Electronics and Application (ICIEA)*, Jun. 2013.

Domestic Journal  
/Conference

Journal: 1 papers, Conference: 7 papers (in Korean)

Patents

US patent: 1, EP patent: 1, Korea patent: 3

1. **Seungryong Kim** et al., "Matching Device and Method between Multi-spectral Images," Korea patent no.: 10-2014-0187297, Dec. 23, 2014.

RESEARCH  
EXPERIENCES

**Microsoft Research Asia, Internet Graphics Group**  
(*Research Intern*)

Beijing, China  
Sep. 2015 – Feb. 2016

- Developed unified depth prediction and intrinsic image decomposition from a single image
- Developed deep feature description for dense cross-modal correspondence

**Yonsei University, Dept. of Electrical and Electronic Engineering**  
(*Research Assistant*)

Seoul, Korea  
Mar. 2012 – Present

- **Fundamental Study of Vision Algorithms for Comprehensive and Through Understanding of Videos**
  - Aug. 2017 – Dec. 2020
  - Funded by Ministry of Science, ICT and Future Planning
  - Developed an algorithm for understanding untrimmed videos
- **Emotional Intelligence Technology to Infer Human Emotion and Carry on Dialogue Accordingly**
  - Dec. 2016 – Dec. 2020
  - Funded by Institute of Information & Communication Technology (IITP)
  - Developed an algorithm for inferring human emotion from multi-spectral images
- **Development of the High-Precision AR & VR Contents Based on Smart-Car Sensors**
  - Jan. 2017 – Dec. 2021
  - Funded by Institute of Information & Communication Technology (IITP)
  - Developed an algorithm for the high-precision 3-D map using multi-sensor fusion
  - Developed CNNs architecture for dense stereo matching in outdoor environments
- **Development of Highly Efficient and Advanced Image Processing Algorithms for Autostereoscopic 3-D Display**
  - Dec. 2016 – Nov. 2019
  - Funded by Ministry of Science, ICT and Future Planning
  - Developed a cloud computing and deep learning system for IoT mobile devices
- **Development of the High-Precision AR & VR Contents Based on Smart-Car Sensors**
  - Apr. 2016 – Dec. 2016
  - Funded by Institute of Information & Communication Technology (IITP)
  - Developed an algorithm for the high-precision 3-D map using multi-sensor fusion
  - Developed RGB-FIR-LiDAR-GPS/IMU system for smart-car
- **High Quality 2D-to-Multiview Contents Generation from Large-Scale RGB+D Database**
  - Oct. 2015 – Aug. 2016
  - Funded by Institute of Information & Communication Technology (IITP)
  - Developed deep network for inferring high-quality depth from a single 2-D image
- **Joint Depth and Intrinsic Image Inference for Deep Single Image Understanding from RGB-D Database**
  - Sep. 2015 – Jun. 2016
  - Funded by Institute of Information & Communication Technology (IITP) and Microsoft Research Asia (MSRA)
  - Developed an algorithm estimating high-quality depth and intrinsic images from a single image
  - Developed deep network for inferring depth and intrinsic images
- **Context Analogy: Multimodal Feature Learning for Large Scale Scene Parsing**
  - Oct. 2014 – Jun. 2015
  - Funded by Institute of Information & Communication Technology (IITP) and Microsoft Research Asia (MSRA)
  - Developed multi-modal feature learning approach for large scale scene parsing
  - Developed landmark identification under severe weather conditions
- **Agricultural Drone Developments**
  - Oct. 2014 – Dec. 2014
  - Funded by NOROO Co. Ltd.
  - Developed robust image stabilization and applications in agriculture drone system
- **Development of High Efficient and Advanced Image Processing Algorithms for Auto-stereoscopic 3-D Display**
  - Nov. 2013 – Oct. 2016
  - Funded by Ministry of Science, ICT and Future Planning
  - Developed advanced image matching approach for real-time 3-D display
- **Development of Next Generation Digital TV Broadcasting System**
  - Mar. 2011 – Dec. 2015
  - Funded by Information Technology Research Center of Ministry of Knowledge Economy

- Developed core technology for 3D/4K and 8K UHD TV broadcasting generation/editing
- **Multimodal Stereo Camera for High Precision Hand Tracking**
  - Jul. 2013 – Feb. 2014
  - Funded by **Samsung Electronics** Co. Ltd.
  - Developed real-time image descriptor for RGB-NIR hand tracking system in mobile device
- **Depth Map Enhancement**
  - Jul. 2012 – Mar. 2013
  - Funded by **Samsung Electronics** Co. Ltd.
  - Developed robust image correspondence approach using a novel descriptor in RGB-D
- **Multi-Sensor Based Robust Localization System in the Wild**
  - Sep. 2010 – Aug. 2012
  - Funded by Agency for Defense Development (**ADD**) in Korea Army
  - Developed image correspondence based localization system robust to outdoor conditions

**Yonsei University, Dept. of Electrical and Electronic Engineering**  
(Teaching Assistant)

Seoul, Korea  
Mar. 2012 – Jun. 2012

- Signal and Systems and Advanced Digital Signal Processing

**INNO Wireless**  
(Research Intern)

Pangyu, Korea  
Jun. 2011 – Aug. 2011

- 4-G LTE Chip Developments
  - Developed algorithms and optimization of physical layer DL in TI processor 6405 Chip
  - Developed the multi-core processor for communication equipment

**Yonsei University, Dept. of Electrical and Electronic Engineering**  
(Research Intern)

Seoul, Korea  
Jan. 2011 – Jun. 2011

- Sound Navigation Application Using Sound Localization for Blind People on Android
  - Developed a 3-D audio system on Android app. using HRTF

CO-RESEARCH  
EXPERIENCES

- **Steve Lin** (Senior Researcher), Microsoft Research, China Sep. 2015 – Present
  - Depth prediction and intrinsic image decomposition.
  - Cross-modal image correspondence.
- **Richard Cai** (Lead Researcher), Microsoft Research, China Oct. 2014 – Present
  - Multi-modal feature learning approach for large scale scene parsing.
- **Dongbo Min** (Professor), Chungnam National Univ., Korea Aug. 2014 – Present
  - Robust feature descriptor design for multi-spectral and multi-modal images.
  - Geometrical distortion-invariant descriptor design for multi-spectral and multi-modal images.
  - Multi-modal feature learning approach for large scale scene parsing.
- **Seon Joo Kim** (Professor), Yonsei Univ., Korea Jan. 2014 – Present
  - Robust stereo matching approach for illumination and exposure varying stereo images
- **Bumsub Ham** (Research Fellow), INRIA-WILLOW, France Jan. 2012 – Present
  - Robust feature descriptor design for multi-spectral and multi-modal images.
  - Geometrical distortion-invariant descriptor design for multi-spectral and multi-modal images.
- **Minh N. Do** (Professor), Univ. of Illinois at Urbana-Champaign, USA Aug. 2014 – Present
  - Robust feature descriptor design for multi-spectral and multi-modal images.

AWARDS

**Doctoral Consortium Award**, IEEE ICCV, 2017  
**Honorable Mention Award**, Research Excellence Award, Yonsei University, 2017  
**Nomination Award**, Microsoft Research Asia Fellowship Nomination Award, Microsoft Research, 2016  
**Runner-Up Award**, Hackatone Competition, HYUNDAI Motor Group, 2016  
**Bronze Award**, IEEE Student Paper Contest, IEEE Seoul Section, 2012  
**Volunteer Award**, IEEE Broadcast Technology Society, 2012

**Honor Graduation Award**, Yonsei University, 2012  
**Excellent Award**, COEX 2011 Capstone Design Symposium  
**Best Award**, Capstone Design Symposium, Korea University, 2011  
**Best Award**, Creative Research Competition, Yonsei University, 2011

PROFESSIONAL  
ACTIVITIES

Student Member of IEEE

**Reviewer for Journal**

- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)
- IEEE Signal Processing Letters (SPL)
- Pattern Recognition (PR)
- Expert Systems with Applications (ESWA)

SKILL

**Programming Languages**

- Visual C/C++, NET, Python, MATLAB, OpenCV, OpenGL

*Last Update: Feb. 03, 2018*