Seungryong Kim's Curriculum Vitae

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

CONTACT INFORMATION	Tel.:	*+82-2-2123-2879*
	E-mail:	*srkim89@yonsei.ac.kr*
	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. Stephen 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. **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**)
2. 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**)
3. 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**)
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. **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**)
6. **Seungryong Kim**, Dongbo Min, Bumsub Ham, Minh N. Do, and Kwanghoon Sohn, "DASC: Robust Dense Descriptor for Muiti-modal and Multi-spectral Correspondence Estimation," *IEEE Trans. on Pattern Analysis and Machine Intelligent* (**TPAMI**), 2017.
   (5-year Impact Factor: **12.290**)
7. Sunok Kim, Dongbo Min, **Seungryong Kim**, and Kwanghoon Sohn, "Feature Augmentation for Learning Confidence Measure in Stereo Matching," *IEEE Trans. on Image Processing* (**TIP**).
   (Accepted)

(5-year Impact Factor: **6.127**)

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 Major Revision)
   (5-year Impact Factor: **4.991**)
2. **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 Intelligent* (**TPAMI**).
   (Under Review)
   (5-year Impact Factor: **12.290**)

International Conference

1. **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**)
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. **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)
9. 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.
10. **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)
11. **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)
12. 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.
13. **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.
14. 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.

15. 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)
16. 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.
17. **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)
18. Kihong Park, Seungchul Ryu, **Seungryong Kim**, and Kwanghoon Sohn, "Statistical Approach for Supervised Codeword Selection," *in Proc. Electronic Imaging* (**EI**), Feb. 2015.
19. 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.
20. **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)
21. **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.
22. 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.
23. **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)
24. **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 — Beijing, China
(Research Intern) — 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 — Seoul, Korea
(Research Assistant) — Mar. 2012 – Present

- **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 UHDTV 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 Seoul, Korea
(Teaching Assistant) Mar. 2012 – Jun. 2012

- Signal and Systems and Advanced Digital Signal Processing

INNO Wireless Pangyu, Korea
(Research Intern) 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 Seoul, Korea
(Research Intern) 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-RESARCH EXPERIENCES

- **Stephen Lin** (Senior Researcher), Microsoft Research Asia, China Sep. 2015 – Present
  - Depth prediction and intrinsic image decomposition.
  - Cross-modal image correspondence.

- **Richard Cai** (Lead Researcher), Microsoft Research Asia, 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: Aug. 30, 2017