

Sunghoon Im

CONTACT INFORMATION	DGIST (Daegu Gyeongbuk Institute of Science and Technology) Department of Information and Communication Engineering E3-314, Techno jungang-daero 333, Hyeonpung-eup, Dalseong-gun, Daegu, Republic of Korea, 42988	Tel.: +82-053-785-6323 E-mail: sunghoonim@dgist.ac.kr Web: https://sunghoonim.github.io/
RESEARCH INTERESTS	Computer Vision (3D reconstruction, Scene understanding) Machine Learning (Deep learning, AI for social good) Robot Vision (Sensor fusion, SLAM)	
ACADEMIC APPOINTMENTS	DGIST , Daegu, Korea <i>Assistant Professor</i> , Information and Communication Engineering	Sep 2019 – Present
	Carnegie Mellon University (CMU) , Pittsburgh, US <i>Visiting Scholar</i> , Robotics Institute, working with Prof. Martial Hebert and Prof. Jean Oh.	Jun 2019 – Aug 2019
	Microsoft Research Asia (MSRA) , Beijing, China <i>Research Intern</i> , Internet Graphics Group, working with Dr. Stephen Lin.	Feb 2018 – Aug 2018
	KAIST , Daejeon, Korea <i>Research Assistant</i> , Robotics and Computer Vision Lab., working with Prof. In So Kweon	Mar 2014 – Aug 2019
EDUCATION	KAIST , Daejeon, Korea Ph.D., Electrical Engineering • Dissertation: "Robust 3D Imaging using a Single Hand-held Cameras" • Advisor: Prof. In So Kweon	Aug 2019
	M.S., Electrical Engineering • Advisor: Prof. In So Kweon	Feb 2016
	Sogang University , Seoul, Korea B.S., Electronic Engineering • Summa cum laude	Feb 2014
PUBLICATIONS	International Journal <ol style="list-style-type: none">1. Sunghoon Im, Hyowon Ha, Hae-Gon Jeon, Stephen Lin and In So Kweon, "Deep Depth from Uncalibrated Small Motion Clip", <i>IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)</i>, Accepted (Apr 2021 expected).2. Hae-Gon Jeon, Jaeheung Surh, Sunghoon Im and In So Kweon, "Ring Difference Filter for Fast and Noise Robust Depth from Focus", <i>IEEE Transactions on Image Processing (TIP)</i>, Dec 2020.3. Sunghoon Im, Hae-Gon Jeon and In So Kweon, "Robust Depth Estimation using Auto-Exposure Bracketing", <i>IEEE Transactions on Image Processing (TIP)</i>, May 2019.	

4. **Sunghoon Im**, Hyowon Ha, Gyeongmin Choe, Hae-Gon Jeon, Kyungdon Joo and In So Kweon, “Accurate 3D Reconstruction from Small Motion Clip for Rolling Shutter Cameras”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, Apr 2019.
5. 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)*, Feb 2018.
6. Seunghak Shin, **Sunghoon Im**, Inwook Shim, Hae-Gon Jeon, and In So Kweon, “Geometry Guided 3D propagation for Depth from Small Motion”, *IEEE Signal Processing Letters (SPL)*, Dec 2017.

International Conference

1. Seunghun Lee, Sunghyun Cho, **Sunghoon Im**, “DRANet: Disentangling Representation and Adaptation Networks for Unsupervised Cross-Domain Adaptation”, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Jun 2021.
2. Seokju Lee, **Sunghoon Im**, Stephen Lin and In So Kweon, “Learning Monocular Depth in Dynamic Scenes via Instance-Aware Projection Consistency”, *The Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI)*, Feb 2021.
3. Hae-Gon Jeon, **Sunghoon Im**, Jean Oh and Martial Hebert, “Learning Shape-based Representation for Visual Localization in Extremely Changing Conditions”, *IEEE International Conference on Robotics and Automations (ICRA)*, May 2020.
4. Hae-Gon Jeon, **Sunghoon Im**, Byeong-Uk Lee, Dong-Geol Choi, Martial Hebert and In So Kweon, “DISC: A Large-scale Virtual Dataset for Simulating Disaster Scenarios”, *IEEE/RSJ International Conference on Intelligence Robots and System (IROS)*, Nov 2019.
5. Seokju Lee, **Sunghoon Im**, Stephen Lin and In So Kweon, “Learning Residual Flow as Dynamic Motion from Stereo Video”, *IEEE/RSJ International Conference on Intelligence Robots and System (IROS)*, Nov 2019.
6. **Sunghoon Im**, Hae-Gon Jeon, Stephen Lin and In So Kweon, “DPSNet: End-to-end Deep Plane Sweep Stereo”, *International Conference on Learning Representations (ICLR)*, May 2019.
7. Byeong-Uk Lee, Hae-Gon Jeon, **Sunghoon Im** and In So Kweon, “Depth Completion with Deep Geometry and Context Guidance”, *IEEE International Conference on Robotics and Automations (ICRA)*, May 2019.
8. **Sunghoon Im**, Hae-Gon Jeon and In So Kweon, “Robust Depth Estimation from Auto Bracketed Images”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Jun 2018.
9. Jaeheung Surh, Hae-Gon Jeon, Yunwon Park, **Sunghoon Im**, Hyowon Ha and In So Kweon, “Noise Robust Depth from Focus using a Ring Difference Filter”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR) [Spotlight]*, Jul 2017.
10. **Sunghoon Im**, Hyowon Ha, Francois Rameau, Hae-Gon Jeon, Gyeongmin Choe and In So Kweon, “All-around Depth from Small Motion with A Spherical Panoramic Camera”, *In Proc. of European Conference on Computer Vision (ECCV)*, Oct 2016.

11. Hyowon Ha, **Sunghoon Im**, Jaesik Park, Hae-Gon Jeon and In So Kweon, “High-quality Depth from Uncalibrated Small Motion Clip”, *In Proc. of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)* [Oral], Jun 2016.
12. 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)*, Jun 2016.
13. **Sunghoon Im**, Hyowon Ha, Gyeongmin Choe, Hae-Gon Jeon, Kyungdon Joo and In So Kweon, “High Quality Structure from Small Motion for Rolling Shutter Cameras”, *In Proc. of IEEE International Conference on Computer Vision (ICCV)*, Dec 2015.
14. **Sunghoon Im**, Gyeongmin Choe, Hae-Gon Jeon and In So Kweon, “Depth from Accidental Motion using Geometry Prior”, *In Proc. of IEEE International Conference on Image Processing (ICIP)* [Top 10% paper], Sep 2015.

International Workshop

1. Seokju Lee, **Sunghoon Im**, Stephen Lin and In So Kweon, “Instance-wise Depth and Motion Learning from Monocular Videos”, *Workshop on Machine Learning for Autonomous Driving & Workshop on Differentiable computer vision, graphics, and physics in machine learning (NeurIPS)*, Dec 2020.

Other Publications

1. Jaeheung Surh, Hae-Gon Jeon, Hyowon Ha, **Sunghoon Im** and In So Kweon, “Fast Depth from Defocus with Your Mobile Phone for Synthetic Defocus”, *In Proc. of the 28th Workshop on Image Processing and Image Understanding (IPIU)*, Feb 2016.
2. **Sunghoon Im**, Hae-Gon Jeon, Hyowon Ha and In So Kweon, “Depth Estimation from Light Field Cameras”, *In Proc. of the 12th International Conference on Ubiquitous Robots and Ambient Intelligence (URAI)*, Oct 2015.
3. Dong-jin Kim, Donggeun Yoo, **Sunghoon Im**, Namil Kim, T. Sirinukulwattana and In So Kweon, “Relative Attributes with Deep Convolutional Neural Network”, *In Proc. of the 12th International Conference on Ubiquitous Robots and Ambient Intelligence (URAI)*, Oct 2015.

PATENTS

Registration

1. METHOD AND APPARATUS FOR ESTIMATING DEPTH USING RING DIFFERENCE FILTER, Publication date: Sep 28, 2018. (10-2017-0091717)
2. DEPTH MAP ACQUISITION DEVICE AND DEPTH MAP ACQUISITION METHOD, Publication date: Apr 19, 2018. (10-2016-0103546)
3. METHOD AND APPARATUS FOR ACQUIRING DEPTH MAP FROM ALL-AROUND CAMERA, Publication date: Apr 17, 2018. (10-2016-0167525)
4. DEPTH INFORMATION ACQUIRING DEVICE AND METHOD THEREOF, Publication date: Aug 11, 2017. (10-2016-0076766)
5. APPARATUS AND METHOD FOR DEPTH MAP GENERATION, Publication date: Jun. 02, 2016. (10-2016-0015703)

RESEARCH
GRANTS

On-going projects

1. Multi-spectral Stereo-based Dynamic Scene Understanding

- Principal investigator
- Young Researcher Program, National Research Foundation of Korea (NRF)
- 2020.03.01 - 2023.02.28 (36 months, ₩300M)

2. Development of Low Latency VR-AR streaming Technology based on 5G edge cloud

- Research participant
- Institute of Information communications Technology Planning Evaluation(IITP)
- 2020.04.01 - 2023.12.31 (45 months, ₩240M)

3. Collaborative AI based Autonomous Driving System toward Safe, Reliable, and Scalable Human-in-the-Loop Cloud Mobility Service

- Research participant
- P-COE (Center of Excellence), DGIST
- 2020.05.01 - 2022.12.31 (32 months, ₩195M)

Finished projects

1. All-around 3D reconstruction with hand-held VR cameras for augmented reality

- Principal investigator
- Global Ph.D. Fellowship, National Research Foundation of Korea (NRF)
- 2016.03.01 - 2019.02.28 (36 months, ₩60M + Full scholarship)

2. A study on learning-based novel-view synthesis algorithms for multi-view LF images

- Principal investigator
- ETRI, ICT RD program of MSIP/IITP
- 2020.03.01 - 2020.11.30 (9 months, ₩40M)

3. Advancement of geographic data construction system based on deep learning

- Research participant
- Dabeoo
- 2020.06.15 - 2020.12.15 (6 months, ₩16M)

TEACHING

- Introduction to Deep Learning, Fall 2020.
- Deep Learning, Spring 2020.
- Computer Vision, Fall 2019, Spring 2021.

EDITOR

- The Information and Communications Technology Express (ICT Express)

REVIEWER
(JOURNAL)

- International Journal of Computer Vision (IJCV)
- Computer Vision and Image Understanding (CVIU)
- Pattern Recognition (PR)
- Neurocomputing
- IEEE Robotics and Automation Letters (RAL)
- IEEE Access
- International Journal of Control, Automation and Systems (IJCAS)
- IEIE Transactions on Smart Processing and Computing (IEIE SPC)
- Journal of Institute of Control, Robotics and Systems (ICROS)

REVIEWER (CONFERENCE)	<ul style="list-style-type: none"> • IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2019, 2020, 2021 • IEEE International Conference on Computer Vision (ICCV) 2019 • European Conference on Computer Vision (ECCV) 2020 • Conference on Neural Information Processing Systems (NeurIPS) 2020 • International Conference on Machine Learning (ICML) 2020, 2021 • International Conference on Learning Representations (ICLR) 2021 • Association for the Advancement of Artificial Intelligence (AAAI) 2020, 2021 • IEEE International Conference on Robotics and Automations (ICRA) 2021 • IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2017 • Asian Conference on Computer Vision (ACCV) 2020 • IEEE Winter Conference on Applications of Computer Vision (WACV) 2020 • International Conference on 3D Vision (3DV) 2020 • International Conference on Machine Vision Applications (ICMVA) 2021 • International Conference on Control, Automation and Systems (ICCAS) 2020 	
INDUSTRY CONSULTATION	<ul style="list-style-type: none"> • DWorld, Feb-Mar 2021 • Dabeo, Feb-Jun 2020 	
TUTORIAL	<ul style="list-style-type: none"> • Deep Learning for Computer Vision, DWorld, Jan-Feb 2021 • Multiple View Geometry, KETI Sangam, Aug-Oct 2020 	
INVITED TALKS	<ul style="list-style-type: none"> • ETRI (Electronics and Telecommunications Research Institute), Daejeon • ETRI (Electronics and Telecommunications Research Institute), Daegu • GIST • KETI (Korea Electronics Technology Institute), Sangam • POSTECH • KETI (Korea Electronics Technology Institute), Pangyo • DGIF (Daegu Technopolis Grand Innovation Festival) • ETRI (Electronics and Telecommunications Research Institute), Daejeon • Sogang University • Lunit • SAIT (Samsung Advanced Institute of Technology) • Koh Young Technology 	Oct 2020 Oct 2020 Jun 2020 Jan 2020 Dec 2019 Nov 2019 Oct 2019 Sep 2019x Sep 2019 Aug 2019 Apr 2019 Jan 2019
AWARDS	<ul style="list-style-type: none"> • Excellent Student Award, 2018 Research Performance Evaluation, KAIST EE • Best Poster Award, 2018 Samsung AI Forum, Samsung Research • Excellent Intern Award, Microsoft Research Asia (MSRA) • Honor Student Award, 2017 Research Performance Evaluation, KAIST EE • Kim Choong-Ki Award, 2016 Research Performance Evaluation, KAIST EE • Best Poster Presentation Award, IPIU 2017 • Qualcomm Innovation Award 2016, Qualcomm Korea Corp. and KAIST • Silver prize, 22th HumanTech Paper Award, Samsung Electronics Co., Ltd. • Best Poster Award, IWRCV 2015 General Chair • Official Best 10% Paper Selection, ICIP 2015 Organizing Committee • Design Project Competition(Silver Prize), Sogang University • Prize for the top first percentile GPA, Sogang University 	Apr 2019 Sep 2018 Aug 2018 Apr 2018 Apr 2017 Feb 2017 Mar 2016 Feb 2016 Nov 2015 Sep 2015 Nov 2013 Sep 2011, Feb 2012, Sep 2012
HONORS	<ul style="list-style-type: none"> • NeurIPS 2020 Top 10% of high-scoring reviewer • CVPR 2019 Doctoral Consortium • ICLR 2019 Travel Award • Microsoft Research Asia (MSRA) fellowship 2018 Winner • Global Ph.D. Fellowship, National Research Foundation of Korea 	Oct 2020 Jun 2019 May 2019 Oct 2018 Aug 2016

- International Computer Vision Summer School (ICVSS 2016), Sicily, Italy July 2016
- Summa Cum Laude, Sogang University Feb 2014
- Academic Excellence Scholarship, Sogang University Seb 2012 – Feb 2013
- Scholarship, Korea Scholarship Foundation Feb 2012 – Feb 2014

IT SKILLS

- Languages: Python, MATLAB, C, C++, \LaTeX
- Deep Learning Framework: Pytorch, Torch, Tensorflow

Last Update: 2021/03/02