Sunghoon Im

| CONTACT INFORMATION | DGIST (Daegu Gyeongbuk Institute of Science and Technology) Dept. Electrical Engineering and Computer Science (EECS) Dept. Artificial Intelligence (AI) E3-314, Techno jungang-daero 333, Hyeonpung-eup, Dalseong-gun, Daegu, Republic of Korea, 42988 | Tel.: +82-53-785-6323 E-mail: sunghoonim@dgist.ac.kr Homepage: https://cvlab.dgist.ac.kr/ |

RESEARCH INTERESTS

Computer Vision (3D reconstruction/localization, Scene understanding)

Deep Learning (Data-hungry, Generalization, Robustness)

Applications - Autonomous driving, AR/VR

ACADEMIC APPOINTMENTS

DGIST, Daegu, Korea   Mar 2022 – Present

Associate Professor, Electrical Engineering and Comptuer Science

DGIST, Daegu, Korea   Sep 2019 – Feb 2022

Assistant Professor, Electrical Engineering and Comptuer Science

Carnegie Mellon University (CMU), Pittsburgh, US   Jun 2019 – Aug 2019

Visiting Scholar, Robotics Institute, working with Prof. Martial Hebert and Prof. Jean Oh.

Microsoft Research Asia (MSRA), Beijing, China   Feb 2018 – Aug 2018

Research Intern, Internet Graphics Group, working with Dr. Stephen Lin.

KAIST, Daejeon, Korea   Mar 2014 – Aug 2019

Research Assistant, Robotics and Computer Vision Lab., working with Prof. In So Kweon

EDUCATION

KAIST, Daejeon, Korea

Ph.D., Electrical Engineering   Aug 2019

- Dissertation: "Robust 3D Imaging using a Single Hand-held Cameras"
- Advisor: Prof. In So Kweon

M.S., Electrical Engineering   Feb 2016

- Advisor: Prof. In So Kweon

Sogang University, Seoul, Korea

B.S., Electronic Engineering   Feb 2014

- Summa cum laude

PUBLICATIONS

International Journal

1. Jeonghoon Kim, **Sunghoon Im**, and Sunghyun Cho, "ProFeat: Unsupervised Image Clustering via Progressive Feature Refinement", *Pattern Recognition Letters* (**PRL**), Nov 2022.

2. Jaeyeul Kim*, Jungwan Woo*, and **Sunghoon Im**, "RVMOS: Range-View Moving Object Segmentation leveraged by Semantic and Motion Features", *IEEE Robotics and Automation Letters* (**RAL**), Jun 2022.

3. Seokju Lee, Francois Rameau, **Sunghoon Im**, and In So Kweon, "Self-supervised Monocular Depth and Motion Learning in Dynamic Scenes: Semantic Prior to Rescue", *International Journal of Computer Vision* (**IJCV**), 2022.

4. Hae-Gon Jeon, **Sunghoon Im**, Jaesung Choe, Minjun Kang, Joon-Young Lee, and Martial Hebert, "CMSNet: Deep Color and Monochrome Stereo", *International Journal of Computer Vision* (**IJCV**), Jan 2022.

5. Hae-Gon Jeon, **Sunghoon Im**, Byeong-Uk Lee, Franois Rameau, Dong-Geol Choi, Jean Oh, In So Kweon, and Martial Hebert, "A Large-scale Virtual Dataset and Egocentric Localization for Disaster Responses", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**), 2022.

6. **Sunghoon Im**, Hyowon Ha, Hae-Gon Jeon, Stephen Lin, and In So Kweon, "Deep Depth from Uncalibrated Small Motion Clip", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**), Apr 2021.

7. Hae-Gon Jeon, Jaeheung Surh, **Sunghoon Im**, and In So Kweon, "Ring Difference Filter for Fast and Noise Robust Depth from Focus", *IEEE Transactions on Image Processing* (**TIP**), Dec 2020.

8. **Sunghoon Im**, Hae-Gon Jeon, and In So Kweon, "Robust Depth Estimation using Auto-Exposure Bracketing", *IEEE Transactions on Image Processing* (**TIP**), May 2019.

9. **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.

10. 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.

11. 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/Workshop

1. Wonhyeok Choi and **Sunghoon Im**, "Dynamic Neural Network for Multi-Task Learning Searching across Diverse Network Topologies", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), Jun 2023.

2. Jinwoo Bae, Sungho Moon, and **Sunghoon Im**, "Deep Digging into the Generalization of Self-supervised Monocular Depth Estimation", *The Thirty-Seventh AAAI Conference on Artificial Intelligence* (**AAAI**), Feb 2023.

3. Jungwan Woo*, Jaeyeul Kim*, and **Sunghoon Im**, "LiDAR 3D Object Detection via Self-Training and Knowledge Distillation", *ECCV workshop on 3D Perception for Autonomous Driving* (**ECCVw**), Oct 2022.

4. Minjun Kang, Jaesung Choe, Hyowon Ha, Hae-Gon Jeon, **Sunghoon Im**, In So Kweon, and Kuk-Jin Yoon, "Facial Depth and Normal Estimation using Single Dual-Pixel Camera", *In Proc. of European Conference on Computer Vision* (**ECCV**), Oct 2022.

5. Seunghun Lee, Wonhyeok Choi, Changjae Kim, Minwoo Choi, and **Sunghoon Im**, "ADAS: A Direct Adaptation Strategy for Multi-Target Domain Adaptive Semantic Segmentation", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), Jun 2022.

6. Jaesung Choe, **Sunghoon Im**, Franois Rameau, Minjun Kang, and In So Kweon, "VolumeFusion: Deep Depth Fusion for 3D Scene Reconstruction", *In Proc. of IEEE International Conference on Computer Vision* (**ICCV**), Dec 2021.

7. Dahoon Park, Kon-Woo Kwon, **Sunghoon Im**, and Jaeha Kung, "ZeBRA: Precisely Destroying Neural Networks with Zero-Data Based Repeated Bit Flip Attack", *British Machine Vision Conference* (**BMVC**), Nov 2021.

8. Seunghun Lee, Sunghyun Cho, and **Sunghoon Im**, "DRANet: Disentangling Representation and Adaptation Networks for Unsupervised Cross-Domain Adaptation", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), Jun 2021.

9. Jeonghoon Kim, **Sunghoon Im**, and Sunghyun Cho, "ProFeat: Unsupervised Image Clustering via Progressive Feature Refinement", *Workshop on Learning From Limited or Imperfect Data* (**CVPRw**), Jun 2021.

10. 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.

11. 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* & *Workhop on Differentiable computer vision, graphics, and physics in machine learning* (**NeurIPSw**), Dec 2020.

12. 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.

13. 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.

14. 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.

15. **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.

16. 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.

17. **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.

18. 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.

19. **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.

20. 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.

21. 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.

22. **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.

23. **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.

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)

TEACHING
- Advanced Deep Learning, Spring 2022.
- Artificial Intelligence Basics, Fall 2021, Fall 2022.
- Introduction to Deep Learning, Fall 2020, Fall 2021, Fall 2022.
- Deep Learning, Spring 2020.
- Computer Vision, Fall 2019, Spring 2021, Spring 2023.

ACADEMIC SERVICES	• Editor - IEIE Transactions on Smart Processing and Computing (SPC) • Web chair - Korean Conference on Computer Vision (KCCV) 2022 • Editor - The Information and Communications Technology Express (ICT Express) • Local chair - International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC) 2021
REVIEWER (JOURNAL)	• IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) • International Journal of Computer Vision (IJCV) • Computer Vision and Image Understanding (CVIU) • IEEE/ASME Transactions on Mechatronics (TMECH) • IEEE Transactions on Instrumentation and Measurement (TIM) • 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)	• SIGGRAPH Asia 2022 • IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2019-2023 • IEEE International Conference on Computer Vision (ICCV) 2019-2023 • European Conference on Computer Vision (ECCV) 2020-2022 • Conference on Neural Information Processing Systems (NeurIPS) 2020-2022 • International Conference on Machine Learning (ICML) 2020-2023 • International Conference on Learning Representations (ICLR) 2021-2023 • Association for the Advancement of Artificial Intelligence (AAAI) 2020-2023 • IEEE International Conference on Robotics and Automations (ICRA) 2021-2022 • 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	• DWorld, Feb-Mar 2021 • Dabeeo, Feb-Jun 2020
TUTORIAL	• Deep Learning for Computer Vision, DWorld, Jan-Feb 2021 • Multiple View Geometry, KETI Sangam, Aug-Oct 2020

INVITED TALKS		
	• KICS Big data and Automobility Workshop, Online	Oct 2022
	• ETRI (Electronics and Telecommunications Research Institute), Daegu	Apr 2022
	• Dongguk University, Seoul	Oct 2021
	• 31st Signal Processing Joint Conference, IEIE, Online	Sep 2021
	• 2nd Korea Artificial Intelligence Conference, Jeju	Sep 2021
	• Kyungpook National University, Daegu	Sep 2021
	• KCCV (Korean Conference on Computer Vision), Seoul	Sep 2021
	• The Korean Institute of Broadcast and Media Engineers, Gyeongju	Apr 2021
	• ETRI (Electronics and Telecommunications Research Institute), Daegu	Mar 2021
	• ETRI (Electronics and Telecommunications Research Institute), Daejeon	Oct 2020
	• ETRI (Electronics and Telecommunications Research Institute), Daegu	Oct 2020

	• GIST	Jun 2020
	• KETI (Korea Electronics Technology Institute), Sangam	Jan 2020
	• POSTECH	Dec 2019
	• KETI (Korea Electronics Technology Institute), Pangyo	Nov 2019
	• DGIF (Daegu Technopolis Grand Innovation Festival)	Oct 2019
	• ETRI (Electronics and Telecommunications Research Institute), Daejeon	Sep 2019
	• Sogang University	Sep 2019
	• Lunit	Aug 2019
	• SAIT (Samsung Advanced Institute of Technology)	Apr 2019
	• Koh Young Technology	Jan 2019

AWARDS	• Best Academic Award, DGIST	Sep 2021
	• Excellent Student Award, 2018 Research Performance Evaluation, KAIST EE	Apr 2019
	• Best Poster Award, 2018 Samsung AI Forum, Samsung Research	Sep 2018
	• Excellent Intern Award, Microsoft Research Asia (MSRA)	Aug 2018
	• Honor Student Award, 2017 Research Performance Evaluation, KAIST EE	Apr 2018
	• Kim Choong-Ki Award, 2016 Research Performance Evaluation, KAIST EE	Apr 2017
	• Best Poster Presentation Award, IPIU 2017	Feb 2017
	• Qualcomm Innovation Award 2016, Qualcomm Korea Corp. and KAIST	Mar 2016
	• Silver prize, 22th HumanTech Paper Award, Samsung Electronics Co., Ltd.	Feb 2016
	• Best Poster Award, IWRCV 2015 General Chair	Nov 2015
	• Official Best 10% Paper Selection, ICIP 2015 Organizing Committee	Sep 2015
	• Design Project Competition(Silver Prize), Sogang University	Nov 2013
	• Prize for the top first percentile GPA, Sogang University	Sep 2011, Feb 2012, Sep 2012

HONORS	• NeurIPS 2020 Top 10% of high-scoring reviewer	Oct 2020
	• CVPR 2019 Doctoral Consortium	Jun 2019
	• ICLR 2019 Travel Award	May 2019
	• Microsoft Research Asia (MSRA) fellowship 2018 Winner	Oct 2018
	• Global Ph.D. Fellowship, National Research Foundation of Korea	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