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,
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RESEARCH INTERESTS

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

Deep Learning (Data-hungry, Generalization, Robustness)

Autonomous driving

ACADEMIC APPOINTMENTS

DGIST, Daegu, Korea — Mar 2023 – Present
Associate Professor, Electrical Engineering and Comptuer Science

DGIST, Daegu, Korea — Sep 2019 – Feb 2023
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 (Co-first*, Corresponding†)

1. Jinwoo Bae, Kyumin Hwang and **Sunghoon Im**†, "A Study on the Generality of Neural Network Structures for Monocular Depth Estimation", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**), Apr 2024.
2. 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**), Jun 2023.

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

4. 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.

5. 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.

6. 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.

7. **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.

8. 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.

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

10. **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.

11. 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.

12. 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 (Co-first*, Corresponding†)

1. Jaeyeul Kim*, Jungwan Woo*, Jeonghoon Kim and **Sunghoon Im**†, "Rethinking LiDAR Domain Generalization: Single Source as Multiple Density Domains", *In Proc. of European Conference on Computer Vision* (**ECCV**), Oct 2024.

2. EungGu Kang, Byeonghun Lee, **Sunghoon Im**† and Kyong Hwan Jin†, "BurstM: Deep Burst Multi-scale SR using Fourier Space with Optical Flow", *In Proc. of European Conference on Computer Vision* (**ECCV**), Oct 2024.

3. Jaeyeul Kim*, Jungwan Woo*, Ukcheol Shin, Jean Oh and **Sunghoon Im**†, "Density-aware Domain Generalization for LiDAR Semantic Segmentation", *IEEE/RSJ International Conference on Intelligent Robots and Systems* (**IROS**), Oct 2024.

4. Woo Kyoung Han, **Sunghoon Im**, Jaedeok Kim and Kyong Hwan Jin, "JDEC: JPEG Decoding via Enhanced Continuous Cosine Coefficients", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), Jun 2024.

5. Wonhyeok Choi*, Mingyu Shin*, Hyukzae Lee, Jaehoon Cho, Jaehyeon Park and **Sunghoon Im**†, "Multi-task Learning for Real-time Autonomous Driving Leveraging Task-adaptive Attention Generator", *IEEE International Conference on Robotics and Automation* (**ICRA**), May 2024.

6. Hojin Kim, Seunghun Lee, Hyeon Kang and **Sunghoon Im**†, "IOffline-to-Online Knowledge Distillation for Video Instance Segmentation", *IEEE/CVF Winter Conference on Applications of Computer Vision* (**WACV**) oral, Jan 2024.

7. Minsu Kim, Jaewon Lee, Byeonghun Lee, **Sunghoon Im** and Kyeonghwan Jin, "Implicit Neural Image Stitching With Enhanced and Blended Feature Reconstruction", *IEEE/CVF Winter Conference on Applications of Computer Vision* (**WACV**), Jan 2024.

8. Wonhyeok Choi*, Mingyu Shin* and **Sunghoon Im**†, "Depth-discriminative Metric Learning for Monocular 3D Object Detection", *Neural Information Processing Systems* (**NeurIPS**), Dec 2023.

9. Changjae Kim, Seunghun Lee and **Sunghoon Im**†, "Multi-Target Domain Adaptation with Class-Wise Attribute Transfer in Semantic Segmentation", *British Machine Vision Conference* (**BMVC**), Nov 2023.

10. Sungho Moon, Jinwoo Bae and **Sunghoon Im**†, "Rotation Matters: Generalized Monocular 3D Object Detection for Various Camera System", *IEEE Conference on Computer Vision and Pattern Recognition Workshop* (**CVPRw**), Jun 2023.

11. 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.

12. 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.

13. 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.

14. 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.

15. 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.

16. 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.

17. 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.

18. 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.

19. 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.

20. 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.

21. 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.

22. 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.

23. 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.

24. 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.

25. **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.

26. 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.

27. **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.

28. 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.

29. **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.

30. 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.

31. 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.

32. **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.

33. **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.

TEACHING

- Advanced Deep Learning, Spring 2022, Srping 2024.
- Artificial Intelligence Basics, Fall 2021, Fall 2022, Fall 2023.
- Introduction to Deep Learning, Fall 2020, Fall 2021, Fall 2022, Fall 2023.
- Deep Learning, Spring 2020.
- Computer Vision, Fall 2019, Spring 2021, Spring 2023.

ACADEMIC SERVICES

- Editor - IEIE Transactions on Smart Processing and Computing (SPC)
- Program committee - Korean Conference on Computer Vision (KCCV) 2022-2024
- 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) 2019-2024
- IEEE International Conference on Computer Vision (ICCV) 2019-2023
- European Conference on Computer Vision (ECCV) 2020-2024
- Conference on Neural Information Processing Systems (NeurIPS) 2020-2024
- International Conference on Machine Learning (ICML) 2020-2024
- International Conference on Learning Representations (ICLR) 2021-2024
- Association for the Advancement of Artificial Intelligence (AAAI) 2020-2024
- IEEE International Conference on Robotics and Automations (ICRA) 2021-2023
- 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

- 10K1M, Mar-Dec 2024
- 10K1M, Jan-Dec 2023
- DWorld, Feb-Mar 2021
- Dabeeo, Feb-Jun 2020

Awards

- Winner, Argoverse LiDAR Scene Flow Challenge (CVPRw) Jun 2024
- Honorable Mention, Argoverse 4D Occupancy Forecasting Challenge (CVPRw) Jun 2024
- Honorable Mention, Argoverse End-to-End Forecasting Challenge (CVPRw) Jun 2023
- AFCV best robot vision paper award Feb 2023
- ADAI: Autonomous Driving A.I. challenge Nov 2022
- ECCV workshop on 3D Perception for Autonomous Driving (ECCVw) 3rd place Oct 2022
- 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

- CVPR 2024 Outstanding reviewer Jun 2024
- 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

Last Update: 2024/07/02