Sunghoon Im

CONTACT INFORMATION

DGIST (Daegu Gyeongbuk Institute of Science and Technology)
Electrical Engineering and Computer Science (EECS) Tel.: +82-53-785-6323
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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 Sep 2019 – Present

Assistant Professor, Information and Communication Engineering

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. Hae-Gon Jeon, **Sunghoon Im**, Jaesung Choe, Minjun Kang, Joon-Young Lee, Martial Hebert, "CMSNet: Deep Color and Monochrome Stereo", *International Journal of Computer Vision* (**IJCV**), Accepted.
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**), Accepted.
3. **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.

4. 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.

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

6. **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.

7. 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.

8. 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. Seunghun Lee, Wonhyeok Choi, Changjae Kim, Minwoo Choi, **Sunghoon Im**, "ADAS: A Direct Adaptation Strategy for Multi-Target Domain Adaptive Semantic Segmentation",

2. Dahoon Park, Kon-Woo Kwon, **Sunghoon Im**, Jaeha Kung, "ZeBRA: Precisely Destroying Neural Networks with Zero-Data Based Repeated Bit Flip Attack",

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

4. 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.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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.

10. 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.

11. **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.

12. 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.

13. **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.

14. 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.

15. **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.

16. 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.

17. 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.

18. **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.

19. **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.
- Introduction to Deep Learning, Fall 2020, Fall 2021.
- Deep Learning, Spring 2020.
- Computer Vision, Fall 2019, Spring 2021.

ACADEMIC SERVICES

- Editor - The Information and Communications Technology Express (ICT Express)
- Local chair - International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC)

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)

- IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2019-2022
- IEEE International Conference on Computer Vision (ICCV) 2019
- European Conference on Computer Vision (ECCV) 2020
- Conference on Neural Information Processing Systems (NeurIPS) 2020-2021
- International Conference on Machine Learning (ICML) 2020-2021
- International Conference on Learning Representations (ICLR) 2021-2022
- Association for the Advancement of Artificial Intelligence (AAAI) 2020-2022
- 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

- 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

- 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

Last Update: 2022/03/01