Jaesik Park

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Chungam-Ro 77, POSTECH, Pohang-Si, Republic of Korea (37673)

Working Experiences

Assistant Professor — Pohang, Republic of Korea
Computer Vision Lab, Pohang University of Science and Technology (POSTECH) — *April. 2019 – Present*

- Principal investigator tackling various computer vision problems
- 3D scene understanding, generative models.

Staff Research Scientist — Santa Clara, CA, USA
Intelligent Systems Lab, Intel — *Dec. 2015 – March 2019*

- Devoted to basic computer vision research (Manager: Dr. Vladlen Koltun)
- Co-founder of Open3D. Tanks and Temples. Efficient point set registration techniques.

Education

Korea Advanced Institute of Science and Technology (KAIST) — Daejeon, Republic of Korea
Ph.D. and M.S. in Electrical Engineering — *Feb. 2009 – Aug. 2015*

- Ph.D. thesis: Image-based 3D Modeling via Constrained Optimization (Advisor: Prof. In So Kweon)
- Master's thesis: Upsampling Low-resolution Image using Heterogeneous High-resolution Image (Advisor: Prof. In So Kweon, Co-advisor: Dr. Yu-Wing Tai)

Hanyang University — Seoul, Republic of Korea
*B.E. in Media Communication Eng. (**Summa cum laude**)* — *March. 2005 – Feb. 2009*

Publications

International

[1] Hyunmin Lee and **Jaesik Park**
STAD: Stable Video Depth Estimation
IEEE International Conference on Image Processing (ICIP), 2021

[2] Taewon Jin, Taesoo Park, Ina Park, **Jaesik Park**, and Ji Hoon Shim
Accelerated Crystal Structure Prediction of Multi-elements Random Alloy using Expandable Features
Scientific Reports published by Nature Research, 2021

[3] Hyomin Kim, Jungeon Kim, Hyeonseo Nam, **Jaesik Park**, and Seungyong Lee
Spatiotemporal Texture Reconstruction for Dynamic Objects Using a Single RGB-D Camera
42nd Annual Conference of the European Association for Computer Graphics (**EuroGraphics**), 2021

[4] Jinsoo Choi, **Jaesik Park**, and In So Kweon
High-quality Frame Interpolation via Tridirectional Inference
Winter Conference on Applications of Computer Vision (**WACV**), 2021

[5] Minguk Kang and **Jaesik Park**
ContraGAN: Contrastive Learning for Conditional Image Generation
Conference on Neural Information Processing Systems (**NeurIPS**), 2020

[6] Jungtaek Kim, Hyunsoo Chung, Minsu Cho, and **Jaesik Park**
Combinatorial 3D Shape Generation via Sequential Assembly
Machine Learning for Engineering Modeling, Simulation, and Design (ML4Eng, **NeurIPS workshop**), 2020

[7] Jinhwi Lee*, Jungtaek Kim*, Hyunsoo Chung, **Jaesik Park**, and Minsu Cho
Fragment Relation Networks for Geometric Shape Assembly
Learning Meets Combinatorial Algorithms (LMCA, **NeurIPS workshop**), 2020

[8] Zhixuan Yu, Jaeshin Yoon, Inkyu Lee, Prashanth Venkatesh, **Jaesik Park**, Jihun Yu, and Hyunsoo Park
HUMBI: A Large Multiview Dataset of Human Body Expressions
Conference on Computer Vision and Pattern Recognition (**CVPR**), 2020

[9] Christopher Choy, Junha Lee, Rene Ranftl, **Jaesik Park**, and Vladlen Koltun
High-Dimensional Convolutional Networks for Geometric Pattern Recognition
Conference on Computer Vision and Pattern Recognition (**CVPR**), 2020

[10] Yue Wu, Rongrong Gao, **Jaesik Park**, and Qifeng Chen
Future Video Synthesis with Object Motion Predictions
Conference on Computer Vision and Pattern Recognition (**CVPR**), 2020

[11] Christopher Choy*, **Jaesik Park***, and Vladlen Koltun
Fully Convolutional Geometric Features
International Conference on Computer Vision (**ICCV**), 2019

[12] Jungeon Kim, Hyomin Kim, **Jaesik Park**, and Seungyong Lee
Global Texture Mapping for Dynamic Objects
Pacific Graphics (**PG**), 2019

[13] Wei Dong, **Jaesik Park**, Yi Yang, and Michael Kaess
GPU Accelerated Robust Scene Reconstruction
IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), 2019

[14] Hae-Gon Jeon, **Jaesik Park**, Gyeongmin Choe, Jinsun Park, Yunsu Bok, Yu-Wing Tai, and In So Kweon
Depth from a Light Field Image with Learning-based Matching Costs
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), 2019

[15] Maxim Tatarchenko*, **Jaesik Park***, Vladlen Koltun, and Qian-Yi Zhou
Tangent Convolutions for Dense Prediction in 3D
Conference on Computer Vision and Pattern Recognition (**CVPR**), 2018

[16] Qian-Yi Zhou, **Jaesik Park**, and Vladlen Koltun
Open3D: A Modern Library For 3D Data Processing
Technical Report, arXiv:1801.09847, 2018

[17] Byungtae Ahn, Dong-Geol Choi, **Jaesik Park**, and In So Kweon
Real-time Head Pose Estimation using Multi-task Deep Neural Network
Robotics and Autonomous Systems (**RAS**), 2018

[18] **Jaesik Park**, Qian-Yi Zhou, and Vladlen Koltun
Colored Point Cloud Registration Revisited
International Conference on Computer Vision (**ICCV**), 2017

[19] Arno Knapitsch, **Jaesik Park**, Qian-Yi Zhou, and Vladlen Koltun
Tanks and Temples: Benchmarking Large-Scale Scene Reconstruction
ACM Transactions on Graphics (Proc. **SIGGRAPH**), 2017

[20] Seong heum Kim, Yu Wing Tai, Joon Young Lee, **Jaesik Park**, and In So Kweon
Category Specific Salient View Selection via Deep Convolutional Neural Networks
Computer Graphics Forum (**CGF**), 2017

[21] **Jaesik Park**, Sudipta N. Sinha, Yasuyuki Matsushita, Yu-Wing Tai, and In So Kweon
Robust Multiview Photometric Stereo using Planar Mesh Parameterization
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), 2016

[22] Qian-Yi Zhou, **Jaesik Park**, and Vladlen Koltun
Fast Global Registration
European Conference on Computer Vision (**ECCV**), 2016

[23] Gyeongmin Choe, **Jaesik Park**, Yu-Wing Tai, and In So Kweon
Refining Geometry from Depth Sensors using IR Shading Images
International Journal of Computer Vision (**IJCV**), 2016

[24] **Jaesik Park**, Yu-Wing Tai, Sudipta N. Sinha, and In So Kweon
Efficient and Robust Color Consistency for Community Photo Collections
Conference on Computer Vision and Pattern Recognition (**CVPR**), 2016

[25] Hyowon Ha, Sunghoon Im, **Jaesik Park**, Hae-Gon Jeon, and In So Kweon
High-quality Depth from Uncalibrated Small Motion Clip
Conference on Computer Vision and Pattern Recognition (**CVPR**), 2016

[26] Inwook Shim, Seunghak Shin, Yunsu Bok, Kyungdon Joo, Dong-Geol Choi, Joon-Young Lee, **Jaesik Park**, Jun Ho Oh, and In So Kweon
Vision System and Depth Processing for DRC-HUBO+
IEEE International Conference on Robotics and Automation (**ICRA**), 2016

[27] Seong-Heum Kim, Yu-Wing Tai, **Jaesik Park**, and In So Kweon
Multi-view Object Extraction with Fractional Boundaries
IEEE Transaction on Image Processing (**TIP**), 2016

[28] Hyowon Ha, **Jaesik Park**, and In So Kweon
Dense Depth and Albedo from a Single-shot Structured Light
International Conference on 3D Vision (**3DV**), 2015

[29] Hae-Gon Jeon, **Jaesik Park**, Gyeongmin Choe, Jinsun Park, Yunsu Bok, Yu-Wing Tai, and In So Kweon
Accurate Depth Map Estimation from a Lenslet Light Field Camera
Conference on Computer Vision and Pattern Recognition (**CVPR**), 2015

[30] SoonMin Hwang, **Jaesik Park**, Namil Kim, Yukyung Choi, and In So Kweon
Multi-modal Pedestrian Detection: Benchmark Dataset and Baselines
Conference on Computer Vision and Pattern Recognition (**CVPR**), 2015

[31] **Jaesik Park**, Hyeongwoo Kim, Yu-Wing Tai, Michael S. Brown, and In-So Kweon
High Quality Depth Map Upsampling and Completion for RGB-D Cameras
IEEE Transaction on Image Processing (**TIP**), 2014

[32] Byungtae Ahn, **Jaesik Park**, and In So Kweon
Real-time Head Orientation from a Monocular Camera using Deep Neural Network
Asian Conference on Computer Vision (**ACCV**), 2014

[33] Jinsoo Choi, Byungtae Ahn, **Jaesik Park**, and In So Kweon
GMM-based Saliency Aggregation for Calibration-free Gaze Estimation
International Conference on Image Processing (**ICIP**), 2014

[34] Gyeongmin Choe*, **Jaesik Park***, Yu-Wing Tai, and In So Kweon
Exploiting Shading Cues in Kinect IR Images for Geometry Refinement
Conference on Computer Vision and Pattern Recognition (**CVPR**), 2014

[35] **Jaesik Park**, Sudipta N. Sinha, Yasuyuki Matsushita, Yu-Wing Tai, and In So Kweon
Calibrating a Non-isotropic Near Point Light Source using a Plane
Conference on Computer Vision and Pattern Recognition (**CVPR**), 2014

[36] **Jaesik Park**, Sudipta N. Sinha, Yasuyuki Matsushita, Yu-Wing Tai, and In So Kweon
Multiview Photometric Stereo using Planar Mesh Parameterization
International Conference on Computer Vision (**ICCV**), 2013

[37] **Jaesik Park**, Tae Hyun Oh, Jiyoung Jung, Yu-Wing Tai, and In So Kweon
Tensor Voting Approach for Multi-View 3D Scene-flow Estimation and Refinement
European Conference on Computer Vision (**ECCV**), 2012

[38] **Jaesik Park**, Joon-Young Lee, Yu-Wing Tai, and In So Kweon
Modeling Photo Composition and Its Application to Photo Re-arrangement
International Conference on Image Processing (**ICIP**), 2012

[39] **Jaesik Park**, Yu-Wing Tai, and In-So Kweon
Identigram/Watermark removal using cross-channel correlation
Conference on Computer Vision and Pattern Recognition (**CVPR**), 2012

[40] Jiyoung Jung, Yekeun Jeong, **Jaesik Park**, Hyowon Ha, J. D. Kim, and In-So Kweon
A Novel 2.5D Pattern for Extrinsic Calibration of ToF and Camera Fusion System
IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), 2011

[41] **Jaesik Park***, Hyeongwoo Kim*, Yu-Wing Tai, Michael S. Brown, and In-So Kweon
High Quality Depth Map Upsampling for 3D-TOF Cameras
International Conference on Computer Vision (**ICCV**), 2011

Domestic

[1] Junha Lee, Seungwook Kim, Minsu Cho, and **Jaesik Park**
계층적 허프 변환을 통한 포인트 클라우드 정합
제 33회 영상처리 및 이해에 관한 워크샵 (IPIU), Feb 2021

[2] Hyunsoo Chung, Jungtaek Kim, Jinhwi Lee, **Jaesik Park**, and Minsu Cho
강화학습을 이용한 그래프 표현 기반의 3차원 물체 생성
제 33회 영상처리 및 이해에 관한 워크샵 (IPIU), Feb 2021

[3] Hyunmin Lee and **Jaesik Park**
일관된 비디오 뎁스 맵 추정을 위한 시간 어텐션 모듈
제 33회 영상처리 및 이해에 관한 워크샵 (IPIU), Feb 2021

[4] Jungeon Kim, Hyomin Kim, **Jaesik Park**, and Seungyong Lee
동적 객체에 대한 전역 텍스쳐 맵 생성
제 32회 영상처리 및 이해에 관한 워크샵 (IPIU), Feb 2020

[5] Min-Hyun Kim, **Jaesik Park**, and In So Kweon
깊이 영상 처리를 위한 학습기반 신뢰도 추정 및 재질 분류
제 27회 영상처리 및 이해에 관한 워크샵 (IPIU)

[6] Junsik Kim, Kyungdon Joo, Tae-Hyun Oh, **Jaesik Park**, and In So Kweon
시야 공유가 없는 다중 카메라를 이용한 사람 추적
제 27회 영상처리 및 이해에 관한 워크샵 (IPIU)

[7] SoonMin Hwang, **Jaesik Park**, Namil Kim, Yukyung Choi, and In So Kweon
컬러-열영상 퓨전을 통한 강인한 보행자 검출 기법
제 27회 영상처리 및 이해에 관한 워크샵 (IPIU)

[8] Hae-Gon Jeon, **Jaesik Park**, Gyeongmin Choe, Jinsun Park, Yunsu Bok, Yu-Wing Tai, and In So Kweon
마이크로 렌즈 기반의 휴대용 라이트필드 카메라를 이용한 정확한 깊이 정보 추정방법
한국멀티미디어학회 춘계학술발표대회, May 2015

[9] Gyeongmin Choe, **Jaesik Park**, Hyowon Ha, and In So Kweon
키넥트 깊이 정밀도 개선을 위한 적외선 패턴 영상의 스테레오 정합
2013년도 한국 멀티미디어 학회 춘계학술 발표대회 논문집 제 16권 1호, May, 2013

[10] **Jaesik Park**, Tae Hyun Oh, Jiyoung Jung, Yu-Wing Tai, and In So Kweon
다시점 영상기반 3차원 움직임 추정기법
제 25회 영상처리 및 이해에 관한 워크샵 (IPIU)

[11] **Jaesik Park**, Yu-Wing Tai, and In So Kweon
컬러 영상의 홀로그램 및 워터마크 제거 기법
제 25회 영상처리 및 이해에 관한 워크샵 (IPIU)

Program Committee

- Area Chair, Machine Vision Applications (MVA) conference, 2021
- Area Chair, International Conference on Computer Vision and Pattern Recognition (CVPR), 2021
- Area Chair, International Conference on Computer Vision (ICCV), 2021
- Senior Program Committee, Int. Joint Conf. on Artificial Intelligence (IJCAI), 2021
- Senior Program Committee, American Assoc. for Artificial Intelligence (AAAI), 2021
- Area Chair, International Conference on Computer Vision and Pattern Recognition (CVPR), 2020
- Area Chair, International Conference on Computer Vision (ICCV), 2019
- Session Chair, International Conference on Computer Vision (ICCV), 2019

Awards

- Qualcomm Gift Grant, Qualcomm Corporation, Dec. 2020
- Faculty Support Program, Intel Corporation, June 2020
- Outstanding Online Class Award, Awarded to five classes among 170 classes, July 2020
- Google Season of Docs, Google Corporation, Technical writer support for Open3D, Apr. 2019
- Qualcomm Gift Grant, Qualcomm Corporation, Sep. 2019
- Research Velocity Challenge Award, Intel Corporation, Dec. 2018
- Depth estimation challenge: robustness champion, CVPR workshop on Light Fields for Computer Vision, July 2017
- Qualcomm Innovation Award, Qualcomm Korea Corp. and KAIST, March 2016
- CVPR 2015 Doctoral Consortium, IEEE CVPR, Apr. 2016
- Honor Prize, KAIST, Annual Ph.D. Research Progress Evaluation, May 2016
- Best Paper Award, Korea Multimedia Society, 2015 Spring Annual Conference, May 2016
- Honor Prize, KAIST, Annual Ph.D. Research Progress Evaluation, May 2015
- 19th HumanTech Paper Award (Silver Prize), Samsung Electronics Corp., Feb. 2013
- Best Paper Award, 25th Workshop on Image Processing and Image Understanding (IPIU2013), Feb. 2013
- Bronze Prize, Samsung Techwin research center conference, Feb. 2012
- Excellent Intern Award, Microsoft Research Asia, Dec. 2012
- Microsoft Research Asia Fellowship, Microsoft, Awarded to 11 Ph.D. students in the top Asian universities., Nov. 2011
- Summa cum laude, Hanyang University, Feb. 2009
- Full Scholarship, Jeongsu scholarship foundation, Aug. 2006
- Scholarship for Selected Undergraduate Students, The Korea Foundation for Advanced Studies (KFAS), June 2006
- Full scholarship, Hanyang University, Aug. 2005

Patents

- 대조 학습과 적대적 생성 신경망을 활용한 이미지 생성 및 편집 방법과 장치, Republic of Korea,
- Tangent Convolutions for 3D Data, US10572770B2, (Application granted),
- 깊이 정보 획득 장치 및 깊이 정보 획득 방법 (Depth Map Acquisition Device And Depth Map Acquisition Method), Patent No. 1018520850000, Republic of Korea, (Application granted),
- 삼차원 영상 정보 획득 방법 및 이를 구현한 컴퓨팅 장치 (Method For Acquiring Three Dimensional Image Information, And Computing Device Implementing The Same Method), Patent No. 1017652570000, Republic of Korea (Application granted),
- 전경 추출 방법 및 장치 (Foreground Area Extracting Method and Apparatus), Patent No. 10-2015-0084331, Republic of Korea.,
- 다중 객체 추적 방법 및 이를 위한 장치 (Method Of Tracking Multiple Objects And Apparatus For The Same), Patent No. 10-2015-0070569, Republic of Korea,
- 깊이 센서와 적외선 음영 영상을 이용한 고품질 3차원 정보 획득 장치 및 방법 (Device and method for obtaining accurate 3D information using depth sensor and infrared shading cues), Patent No. 1017079390000, Republic of Korea. (Application granted),
- 가려짐이 있는 환경에서 이동표적의 위치를 추정하는 방법 (Method for Estimating Location of Moving Target in Occluded Tracking Environment), Patent No. 1012883880000, Republic of Korea. (Application granted),
- 컬러 이미지의 채널간 상관관계를 이용하는 워터마크 제거 방법 (Method for removing watermark using cross-channel correlation of color image), Patent No. 1013952840000, Republic of Korea. (Application granted),

Teaching

- AIGS101 Artifical Intelligence Basis I, Spring, 2021
- CSED538/AIGS538 Deep learning, Spring, 2021
- AIGS101, Artifical Intelligence Basis II, Fall, 2020
- CSED100, Introduction to Computer Science Engineering, Fall, 2020
- CSED703F, 3D Vision, Fall, 2020
- CSED800/AIGS800, CSE/GSAI Colloquium, Fall, 2020
- AIGS101, Artifical Intelligence Basis I, Spring, 2020
- AIGS537/CSED537, Artificial Intelligence and Data Science, 2020 Spring, Spring, 2020
- CSED233, Data Structure, Spring, (Awarded as the outstanding online class), 2020
- CSED703F-01 3D Vision, Fall, 2019

Talks

- Self-Calibrating Neural Radiance Fields, Korea Institute of Science and Technology (KIST), Virtual, June 2021
- Mentor session: how to become a professor, Conference on Computer Vision and Pattern Recognition (CVPR 2021), Virtual, June 2021
- Recent work on Image Generation, Gwangju Institute of Science and Technology (GIST), Virtual, May 2021
- Point Cloud Registration using Hierachical Hough Transform, 33nd Workshop on Image Processing and Image Understanding (IPIU2021), Virtual, Feb. 2021
- 3D Representations and Detections, Chungbuk University, Virtual, Jan. 2021
- Introduction to Computer Vision, Kyungbuk Science High School, Pohang, Republic of Korea, Aug. 2020
- High-Dimensional Convolutional Networks for Geometric Pattern Recognition, KCCV 2020, Seoul, Republic of Korea, Aug. 2020
- Object Detection from Images or Point Clouds, LG Electronics, Seoul, Republic of Korea, Aug. 2020
- Fully Convolutional Geometric Features, Koh Young Technology, Yongin, Republic of Korea, Dec. 2019
- Open3D Tutorial and Fully Convolutional Geometric Features, Korea Electronics Technology Institute, Seongnam, Republic of Korea, Nov. 2019
- Introduction to Computer Vision and Deep Learning, Daegu Science High School, Daegu, Republic of Korea, Aug. 2019
- 3D Computer Vision and Open3D, International Conference on Machine Vision Applications, Tokyo, Japan, May 2019
- 3D Computer Vision and Open3D, Qualcomm Head Quater, San Diego, USA, June 2019
- 3D reconstruction using Open3D, Minneapolis, University of Minnesota, invited lecture for Multiview 3D Geometry in Computer Vision (CSCI 5980) Class, Apr. 2018
- 3D reconstruction using Open3D, Forma Technology (a startup company at Bay Area), San Francisco, USA, March 2018

Reference

- Up on request.