

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] Yoonwoo Jeong, Seokjun Ahn, Christopher Choy, Animashree Anandkumar, Minsu Cho, and **Jaesik Park**
Self-Calibrating Neural Radiance Fields
International Conference on Computer Vision (**ICCV**), 2021
- [2] Junha Lee, Seungwook Kim, Minsu Cho, and **Jaesik Park**
Deep Hough Voting for Robust Global Registration
International Conference on Computer Vision (**ICCV**), 2021
- [3] Hyomin Kim, Jungeon Kim, Jaewon Kam, **Jaesik Park***, and Seungyong Lee*
Deep Virtual Markers for Articulated 3D Shapes
International Conference on Computer Vision (**ICCV**), 2021
- [4] Hyunmin Lee and **Jaesik Park**
STAD: Stable Video Depth Estimation
IEEE International Conference on Image Processing (**ICIP**), 2021
- [5] 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
- [6] Hyomin Kim, Jungeon Kim, Hyeonsoo 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
- [7] Jinsoo Choi, **Jaesik Park**, and In So Kweon
High-quality Frame Interpolation via Tridirectional Inference
Winter Conference on Applications of Computer Vision (**WACV**), 2021
- [8] Minguk Kang and **Jaesik Park**
ContraGAN: Contrastive Learning for Conditional Image Generation
Conference on Neural Information Processing Systems (**NeurIPS**), 2020

- [9] 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
- [10] 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
- [11] 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
- [12] 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
- [13] 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
- [14] Christopher Choy*, **Jaesik Park***, and Vladlen Koltun
Fully Convolutional Geometric Features
International Conference on Computer Vision (**ICCV**), 2019
- [15] Jungeon Kim, Hyomin Kim, **Jaesik Park**, and Seungyong Lee
Global Texture Mapping for Dynamic Objects
Pacific Graphics (**PG**), 2019
- [16] 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
- [17] 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
- [18] 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
- [19] Qian-Yi Zhou, **Jaesik Park**, and Vladlen Koltun
Open3D: A Modern Library For 3D Data Processing
Technical Report, arXiv:1801.09847, 2018
- [20] 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
- [21] **Jaesik Park**, Qian-Yi Zhou, and Vladlen Koltun
Colored Point Cloud Registration Revisited
International Conference on Computer Vision (**ICCV**), 2017
- [22] 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
- [23] 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
- [24] **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
- [25] Qian-Yi Zhou, **Jaesik Park**, and Vladlen Koltun
Fast Global Registration
European Conference on Computer Vision (**ECCV**), 2016

- [26] 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
- [27] **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
- [28] 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
- [29] 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
- [30] 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
- [31] 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
- [32] 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
- [33] 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
- [34] **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
- [35] 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
- [36] 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
- [37] 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
- [38] **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
- [39] **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
- [40] **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
- [41] **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
- [42] **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

- [43] 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
- [44] **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 텍스 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 텍스처 맵 생성
제 32회 영상처리 및 이해에 관한 워크샵 (IPIU), Feb 2020
- [5] Jungeon Kim, Hyomin Kim, **Jaesik Park**, and Seungyong Lee
메시 피라미드를 활용한 3차원 비강체 모델 텍스처 맵 생성
한국컴퓨터그래픽스학회, Jul 2019
- [6] 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)
- [7] 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)
- [8] 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)
- [9] 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
- [10] 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
- [11] **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)
- [12] **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

- Representative research achievements, POSTECH, July 2021
- 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 Artificial Intelligence Basis I, Spring, 2021
- CSED538/AIGS538 Deep learning, Spring, 2021
- AIGS101, Artificial 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, Artificial 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 Hierarchical Hough Transform, 33rd 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.