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Seungwook Kim

Research Scientist, PhD Candidate

LinkedIn: Seung Wook Kim
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I am Seungwook Kim, a highly self-motivated PhD candidate mainly researching on (1) visual correspondences between 2D images or 3D point clouds (and their applications), (2) 2D/3D Equivariance, and (3) {Text,Image}-to-{3D,Video} Generation. I am under the supervision of professor Minsu Cho in the POSTECH Computer Vision Lab.

Education

PhD Candidate / Research Scientist — **08 2020 — Present**
POSTECH Computer Vision Lab — *Pohang, South Korea*

- {Image/Text}-to-{3D/Video} Generation
- 2D Visual Correspondence, a.k.a wide-baseline/semantic image matching.
- 3D Visual Correspondence, a.k.a point cloud registration / geometric assembly
- 2D / 3D equivariance to rotation / scale (joint work with Samsung MX)

Bachelor of Engineering in Computer Sciences and Engineering, *POSTECH* — 07 2020
Cumulative GPA: 3.7 / 4.3
Jigok Scholarship (Full scholarship) — 2015 — 2020
Student Mentoring Program Scholarship (Monthly scholarship) — 2017 — 2020
On-school Work Scholarship (Per-semester scholarship) — 2017 — 2020

Bachelor of Engineering in Computer Sciences and Engineering, *Seoul National University* — 12 2017 — 01 2018
Winter session

Technical Experience

PhD Intern / Data-Intelligent Creation-Vision and Graphics team — **09 2023 — 02 2024**
ByteDance — *CA, USA*

- Worked on improving text-to-3D generation models.
- Worked on improving image-to-3D generation models.
- Published 2 papers: CorrespondentDream (CVPR 2024) and MultiImageDream (Arxiv 2024)

(Emergency) Journal / Conference Reviewer — **08 2020 — Present**

- CVPR (2022-2024), ECCV(2022,2024), ICCV (2023), NeurIPS (2023), ICML (2024)
- 3DV (2022), WACV (2022-2024), ACCV (2024)

Technical Chair — **05 2024 — 12 2024**
ACCV 2024 — *Hanoi, Vietnam*

- (Expected to have) Managed the Microsoft CMT for coordinating paper submission and reviewing process.

Undergraduate Intern / 3D Map construction from LiDAR — **03 2020 — 07 2020**
Polaris3D — *Pohang, South Korea*

- Implemented the process of retrieving data from Intel Realsense cameras to Jetson Nano in real-time.
- Merged the two streams of data from two different angles to output a 3D map in real-time.

Undergraduate Intern / Camera ISP — **12 2019 — 01 2020**
SK Hynix — *Icheon, South Korea*

- Analyzed the image post-processing algorithms applied to raw images obtained from senseors.
- Identified an imbalance in the dark corners (vignetting) of a raw image from a sensor under development.

Undergraduate Intern / AI team — **06 2019 — 08 2019**
Netmarble — *Seoul, South Korea*

- Developed prior speech-to-3D lip synthesis pipeline to be light-weight (mobile-runnable) using TensorFlow.

Undergraduate Intern / Data Engineering & Analysis team — **02 2018 — 12 2018**
Dable — *Seoul, South Korea*

- Analyzed heavy-traffic raw data collected at AWS RedShift using PostgreSQL.
- Developed batch codes that run regularly on the AWS RedShift to output processed data on a MySQL server.
- Analyzed processed data using MySQL.
- Developed web crawling code to identify potential blog clients.

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Publications

[C9] 3D Geometric Shape Assembly via Efficient Point Cloud Matching — ICML 2024
Nahyuk Lee*, Juhong Min*, Junha Lee, ***Seungwook Kim***, Kanghee Lee, Jaesik Park, Minsu Cho

[P1] Multi-view Image Prompted Multi-view Diffusion for Improved 3D Generation — Arxiv 2024
Seungwook Kim, Yichun Shi, Kejie Li, Minsu Cho, Peng Wang

[C8] Enhancing 3D Fidelity of Text-to-3D using Cross-View Correspondences — CVPR 2024
Seungwook Kim, Kejie Li, Xueqing Deng, Yichun Shi, Minsu Cho, Peng Wang

[C7] Learning SO(3)-Invariant Semantic Correspondence via Local Shape Transform — CVPR 2024
Chunghyun Park, **Seungwook Kim***, Jaesik Park, Minsu Cho*

[C6] Efficient Semantic Matching with Hypercolumn Correlation — WACV 2024
Seungwook Kim**, Juhong Min, Minsu Cho* — ***Best paper finalist

[C5] Stable and Consistent Prediction of 3D Characteristic Orientation via Invariant Residual Learning — ICML 2023
***Seungwook Kim**, Chunghyun Park*, Yoonwoo Jeong, Jaesik Park, Minsu Cho*

[C4] Learning Rotation-Equivariant Features for Visual Correspondence — CVPR 2023
*Jongmin Lee, Byungjin Kim, **Seungwook Kim**, Minsu Cho*

[J1] Convolutional Hough Matching Networks for Robust and Efficient Visual Correspondence — TPAMI 2023
*Juhong Min, **Seungwook Kim**, Minsu Cho*

[W1] SeLCA: Self-Supervised Learning of Canonical Axis — NeurReps Workshop 2022
***Seungwook Kim**, Yoonwoo Jeong, Chunghyun Park, Jaesik Park, Minsu Cho*

[C3] TransforMatcher: Match-to-Match Attention for Semantic Correspondence — CVPR 2022
***Seungwook Kim**, Juhong Min, Minsu Cho*

[C2] Deep Hough Voting for Robust Global Registration — ICCV 2021
*Junha Lee, **Seungwook Kim**, Minsu Cho, Jaesik Park*

[C1] Learning to Distill Convolutional Features into Compact Local Descriptors — WACV 2021
*Jongmin Lee, Yoonwoo Jeong, **Seungwook Kim**, Juhong Min, Minsu Cho*

Invited Talks / Mentoring

Research outline talk, *Korean Electronics Technology Institute* — 04 2023
Delivered talk on TransforMatcher: Match-to-Match Attention for Semantic Correspondence (CVPR 2022) / Stable and Consistent Prediction of 3D Characteristic Orientation via Invariant Residual Learning (ICML 2023)

Identifying Match-wise relationships for Semantic Correspondence, *Samsung Advanced Institute of Technology* — 01 2023
Delivered talk on TransforMatcher: Match-to-Match Attention for Semantic Correspondence (CVPR 2022)

Identifying Match-wise relationships for Semantic Correspondence, *Korean Conference on Computer Vision* — 08 2022
Delivered talk on TransforMatcher: Match-to-Match Attention for Semantic Correspondence (CVPR 2022)

Learning Canonical Axis of 3D Objects in a Self-Supervised Manner, *Samsung Advanced Institute of Technology* — 06 2022
Delivered talk on SeLCA: Self Supervised Learning of Canonical Axis (NeurReps Workshop 2022)

POSTECH Tech Review, *POSTECH* — 06 2021 / 06 2022
Delivered talk on adversarial examples and AI safety (2021), and 2D image correspondences (2022)

CORE CSE Undergraduate Mentoring, *POSTECH* — 03 2024 — 05 2024
Mentored 3 undergraduate CSE students on various aspects (study, research, life plans)

Honours & Awards

Hyundai Motor Chung Mong-Koo Foundation Scholarship, *Hyundai Motor* — 07 2023 — current
Approximately 13,000 USD per year

BK21 Outstanding Research Paper Awards, *POSTECH* — 01 2023
Additional 500 USD award in cash

The POSTECHIAN Fellowship - Leadership, *POSTECH* — 12 2022
Additional 1000 USD award in cash

BK21 Outstanding Research Paper Awards, *POSTECH* — 01 2022
Additional 500 USD award in cash

NAVER AI RUSH: 1st runner up in click-through rate (CTR) prediction, *NAVER* — 05 2020 — 07 2020
Additional 7,000 USD award in cash

POSTECH Creative Self-Research Scholarship, *POSTECH* — 09 2020 — 12 2020
5,000 USD funding for self-research

NAVER AI RUSH: 1st runner up in image classification with noisy labels, *NAVER* — 07 2020 — 08 2020
Additional 4,000 USD award in cash