

Inkyu Shin | Curriculum Vitae

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I recently received Ph.D. degree in future vehicle from the Korea Advanced Institute of Science and Technology (KAIST), where I was co-advised by Prof. Kuk-Jin Yoon and Prof. In So Kweon. I earned my B.S and M.S degrees in automotive engineering from Hanyang University(HYU) and KAIST in 2019 and 2021. I interned at NEC Laboratories America, Inc, San Jose, CA (with Dr. Yi-Hsuan Tsai), Google Research (with Dr. Liang-Chieh Chen and Dr. Jun Xie) and recently have engaged in a research internship at ByteDance/TikTok.

Research Interests

My research is dedicated to establishing a robust foundation in the field of computer vision. This endeavor focuses on pioneering advancements in beyond or human-level visual **generation** and **recognition**, while pursuing the **data-efficiency** for generalizability. Specifically, I am interested in the following research topics:

- **Learning for Generative AI**
 - Video Generation / Editing
- **Learning for Visual Recognition**
 - Image Segmentation
 - Video Segmentation
 - Multiple Object Tracking
 - Multiple Camera Tracking
- **Learning for Data-efficiency**
 - Learning from Simulation
 - Domain Adaptation
 - Unsupervised Learning
 - Self-supervised Learning

but also open to other explorable/challenging domains.

The ultimate purpose of this research is to apply to a variety of applications (e.g., Video synthesis, Autonomous driving, Robot navigation, AR/VR).

Research Experience

- **ByteDance / TikTok** **San Jose, CA**
 - Research Intern, Mentors: Liang-Chieh Chen and Qihang Yu* Sep 2023 - Jan 2024
 - Topic: Video Generation / Editing
- **Google Research** **LA, CA (virtual)**
 - Student Researcher Intern, Mentors: Liang-Chieh Chen and Jun Xie* May 2022 - April 2023
 - Topic: Video Recognition / Tracking
- **NEC Laboratories America, Inc** **San Jose, CA (virtual)**
 - Research Intern, Mentor: Yi-Hsuan Tsai* May 2021 - Aug 2021
 - Topic: Test-time Adaptation
- **Korea University** **Seoul, Korea**
 - Research Intern, Supervisor: Jaegul Choo* Sep 2018 - Dec 2018
 - Topic: Image-to-Image Translation

- **Hanyang University**
Research Assistant, Supervisor: Myueng-Ho Sunwoo

Seoul, Korea
Jul 2018 - Aug 2018

Education

- **Korea Advanced Institute of Science and Technology (KAIST)** Daejeon, Korea
Future Vehicle Ph.D. degree, Co-Advisors: Kuk-Jin Yoon and In So Kweon 2021–2024
- **Korea Advanced Institute of Science and Technology (KAIST)** Daejeon, Korea
Future Vehicle M.S degree, Advisor: In So Kweon 2019–2021
Master's Thesis: Learning to Scale the Labels for Self-training based Domain Adaptation
- **Hanyang University (HYU)** Seoul, Korea
AUTOMOTIVE ENGINEERING B.S degree 2013–2019

Publications

(C: conference / J: journal / P: preprint / * :equal contributions)

- **[C14] MTMMC: A Large-Scale Real-World Multi-Modal Camera Tracking Benchmark**
Sanghyun Woo*, Kwanyong Park*, **Inkyu Shin***, Myungchul Kim*, In So Kweon
Computer Vision and Pattern Recognition (**CVPR**), 2024
- **[P3] Video-3DGS: Leveraging 3D Gaussian Splatting for Reconstructing and Editing Videos**
Authors will be TBD, work done during internship in ByteDance / TikTok
- **[C13] Video-kMaX: A Simple Unified Approach for Online and Near-Online Video Panoptic Segmentation**
Inkyu Shin, Dahun Kim, Qihang Yu, Jun Xie, Hong-Seok Kim, Bradley Green, In So Kweon, Kuk-Jin Yoon, Liang-Chieh Chen
Winter Conference on Applications of Computer Vision (**WACV**), 2024 (Oral)
- Also presented at "Transformer For Vision" Workshops in conjunction with "**CVPR**, 2023
- **[C12] MATE: Masked Autoencoders are Online 3D Test-Time Learners**
Muhammad Jehanzeb Mirza*, **Inkyu Shin***, Wei Lin*, Andreas Schriebl, Kunyang Sun, Jaesung Choe, Horst Possegger, Mateusz Kozinski, In So Kweon, Kuk-Jin Yoon, Horst Bischof
International Conference on Computer Vision (**ICCV**), 2023
- **[C11] TTA-COPE: Test-Time Adaptation for Category-Level Object Pose Estimation**
Taeyeop Lee, Jonathan Tremblay, Valts Blukis, Bowen Wen, Byeong-Uk Lee, **Inkyu Shin**, Stan Birchfield, In So Kweon, Kuk-Jin Yoon
Computer Vision and Pattern Recognition (**CVPR**), 2023
- **[C10] Bidirectional Domain Mixup for Domain Adaptive Semantic Segmentation**
Daehan Kim*, Minseok Seo*, Kwanyong Park, **Inkyu Shin**, Sanghyun Woo
Association for the Advancement of Artificial Intelligence (**AAAI**), 2023
- **[C9] Learning Classifiers of Prototypes and Reciprocal Points for Universal Domain Adaptation**
Sungsu Hur, **Inkyu Shin**, Kwanyong Park, Sanghyun Woo, In So Kweon
Winter Conference on Computer Vision (**WACV**), 2023
- **[C8] Moving from 2D to 3D: volumetric medical image classification for rectal cancer staging**
Joohyung Lee*, Jieun Oh*, **Inkyu Shin**, You-sung Kim, Dae Kyung Sohn, Tae-sung Kim, In So Kweon
Medical Image Computing and Computer Assisted Intervention (**MICCAI**), 2023

- **[C7] MM-TTA: Multi-Modal Test-Time Adaptation for 3D Semantic Segmentation**
Inkyu Shin, Yi-Hsuan Tsai, Bingbing Zhuang, Samuel Schulter, Buyu Liu, Sparsh Garg, In So Kweon, Kuk-Jin Yoon
Computer Vision and Pattern Recognition (**CVPR**), 2022
- Received *Qualcomm Innovation Award 2022*.
- **[C6] UDA-COPE: Unsupervised Domain Adaptation for Category-level Object Pose Estimation**
Taeyeop Lee, Byeong-Uk Lee, Inkyu Shin, Jaesung Choe, Ukcheol Shin, In So Kweon, Kuk-Jin Yoon
Computer Vision and Pattern Recognition (**CVPR**), 2022
- **[P2] Unsupervised Domain Adaptation for Video Semantic Segmentation**
Kwanyong Park*, Inkyu Shin*, Sanghyun Woo, In So Kweon
arXiv, 2021
- **[C5] LabOR: Labeling Only if Required for Domain Adaptive Semantic Segmentation**
Inkyu Shin, Dong-Jin Kim, Jae Won Cho, Sanghyun Woo, Kwanyong Park, In So Kweon
International Conference on Computer Vision (**ICCV**), 2021 (**Oral**)
- Received *Qualcomm Innovation Award 2021*.
- **[P1] Learning Representations by Contrasting Clusters While Bootstrapping Instances**
Junsoo Lee, Hojoon Lee, Inkyu Shin, Jaekyoung Bae, In So Kweon, Jaegul Choo
arXiv, 2020
- **[C4] Discover, Hallucinate, and Adapt: Open Compound Domain Adaptation for Semantic Segmentation**
Kwanyong Park, Sanghyun Woo, Inkyu Shin, In So Kweon
Conference on Neural Information Processing Systems (**NeurIPS**), 2020
- Received *Qualcomm Innovation Award 2021*.
- **[C3] Two-phase Pseudo Label Densification for Self-training based Domain Adaptation**
Inkyu Shin, Sanghyun Woo, Fei pan, In So Kweon
European Conference on Computer Vision (**ECCV**), 2020
- Also presented at "Visual Learning with Limited Labels" Workshops in conjunction with (**CVPR**), 2020
- **[C2] Unsupervised Intra-domain Adaptation for Semantic Segmentation through Self-Supervision**
Fei pan, Inkyu Shin, Francois Rameau, Seokju Lee, In So Kweon
Computer Vision and Pattern Recognition (**CVPR**), 2020 (**Oral**)
- Received *Qualcomm Innovation Award 2020*.
- **[C1] Image-to-Image Translation via Group-wise Deep Whitening-and-Coloring Transformation**
Wonwoong Cho, Sungha Choi, David Keetae Park, Inkyu Shin, Jaegul Choo
Computer Vision and Pattern Recognition (**CVPR**), 2019 (**Oral**)

Professional Activities

Conference Reviewer

- CVPR (2022~), ICCV (2023~), NeurIPS (2021~), ICML (2022~)

Awards

- 2022: Qualcomm Innovation Award
- 2021: Qualcomm Innovation Award
- 2020: Qualcomm Innovation Award

IT Skills

- Languages: Python, MATLAB, C, LATEX
- Libraries: PyTorch, TensorFlow

Military Service

- KATUSA at 8th Army, U.S. Army
 - Discharged as a Sergeant
 - Graduated WLC (Sergeant School of U.S. Army) as 7th in rank

References

- **Prof. In So Kweon**
Relationship: M.S & Ph.D Advisor
Professor, Electrical Engineering, KAIST
Email: iskweon77@kaist.ac.kr
- **Prof. Kuk-Jin Yoon**
Relationship: Ph.D Advisor
Professor, Mechanical Engineering, KAIST
Email: kjyoon@kaist.ac.kr
- **Dr. Yi-Hsuan Tsai**
Relationship: Internship mentor at NEC Lab.
(Previous) Research scientist, NEC Lab.
(Current) AI/ML Tech Lead Manager, Google
Email: wasidennis@gmail.com
- **Dr. Liang-Chieh Chen**
Relationship: Internship mentor at Google Research / ByteDance
(Previous) Research scientist, Google Research
(Current) Research scientist, ByteDance
Email: lcchen@cs.ucla.edu