

Inkyu Shin | Curriculum Vitae

☎ 669-340-9733 • ✉ dlsrbgg33@gmail.com

I am a Research Scientist at ByteDance / TikTok. I received my Ph.D. in Future Vehicle (Electrical Engineering) from the Korea Advanced Institute of Science and Technology (KAIST), co-advised by Prof. Kuk-Jin Yoon and Prof. In So Kweon. I earned my B.S. and M.S. degrees from Hanyang University (2019) and KAIST (2021), respectively. I held research internship positions at NEC Laboratories America (with Dr. Yi-Hsuan Tsai), Google Research (with Dr. Liang-Chieh Chen and Dr. Jun Xie), and ByteDance/TikTok (with Dr. Liang-Chieh Chen and Dr. Qihang Yu). I bring over six years of experience in computer vision and deep learning.

Research Interests

My research is dedicated to establishing a robust AI foundation model and agent. This endeavor focuses on pioneering advancements in beyond or human-level multimodal understanding (both for **generation** and **perception**), while pursuing the **data-efficiency** and **adaptability**. Specifically, I am interested in the following research topics:

- **Learning for Generation**
 - Text-to-Image Generation
 - Text-to-Video Generation
- **Learning for Perception**
 - Image Segmentation
 - Video Segmentation
 - Multiple Object Tracking
 - Multiple Camera Tracking
- **Learning for Multi-modal Agent**
 - Self-evolving Multi-modal Agent
- **Learning for Data-efficiency and Adaptability**
 - Learning from Simulation
 - Unsupervised Learning
 - Test-time Training & Adaptation

but also open to other explorable/challenging domains.

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

Research Experience

- **ByteDance / TikTok**

San Jose, CA
Aug 2024 - Current

Research Scientist

- Leading research on Text-to-X Generation
- **ByteDance / TikTok**

San Jose, CA
Sep 2023 - Jan 2024

Research Intern, Mentors: Liang-Chieh Chen and Qihang Yu

- Topic: Text-to-Video Generation / Editing
- **Google Research**

LA, CA (virtual)
May 2022 - April 2023

Student Researcher Intern, Mentors: Liang-Chieh Chen and Jun Xie

- Topic: Video Understanding / Tracking

- **NEC Laboratories America, Inc** **San Jose, CA (virtual)**
Research Intern, Mentor: Yi-Hsuan Tsai
 - Topic: Test-time Adaptation
May 2021 - Aug 2021
- **Korea University** **Seoul, Korea**
Research Intern, Supervisor: Jaegul Choo
 - Topic: Image-to-Image Translation
Sep 2018 - Dec 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
 Master's Thesis: Learning to Scale the Labels for Self-training based Domain Adaptation
2019–2021
- **Hanyang University (HYU)** **Seoul, Korea**
AUTOMOTIVE ENGINEERING B.S degree
2013–2019

Publications

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

- **[UR1] Text-to-4D Generation**
 Minjun Kang, **Inkyu Shin**, Taeyeop Lee, In So Kweon Kuk-Jin Yoon
- **[C15] Deeply Supervised Flow-based Generative Models**
Inkyu Shin, Chenglin Yang, Liang-Chieh Chen
 International Conference on Computer Vision (ICCV), 2025
- **[J2] Enhancing Temporal Consistency in Video Editing by Reconstructing Videos with 3D Gaussian Splatting**
Inkyu Shin, Qihang Yu, Xiaohui Shen, In So Kweon, Kuk-Jin Yoon, Liang-Chieh Chen
 Transactions on Machine Learning Research (TMLR), 2025
- **[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
- **[J1] MaXTron: Mask Transformer with Trajectory Attention for Video Panoptic Segmentation**
 Ju He, Qihang Yu, **Inkyu Shin**, Xueqing Deng, Xiaohui Shen, Alan Yuille, Liang-Chieh Chen
 Transactions on Machine Learning Research (TMLR), 2024
- **[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 Schuster, 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**)

Professtional Activities

Conference Reviewer

- CVPR (2022~), ICCV (2023~), ECCV (2024~), WACV (2024~), NeurIPS (2021~), ICLR (2024~), ICML (2022~)

Journal Reviewer

- TPAMI

Awards

- 2022: Qualcomm Innovation Award
- 2021: Qualcomm Innovation Award
- 2021: Best MS Thesis Award at Future Vehicle in KAIST
- 2020: Qualcomm Innovation Award

Skills

- Programming Languages: Python, Matlab, C
- Machine Learning Frameworks: Pytorch, Tensorflow, JAX
- Agent Frameworks: Langchain, Langgraph, MCP (Model Context Protocol)

Projects

AI Agents

- *Bay K-AI Group* *May 2025 - Current*
 - Self-evolving Agents (*On-going project*)
 - Specialized Agents and MCP: Colab Demo.

Multi Camera Tracking for COVID Patients

- *KAIST* *Jan 2022 - Aug 2024*
 - Designed large-scale datasets and algorithms: Project page.

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 Laboratories America, Inc.
(Previous) Research scientist, NEC Laboratories America, Inc. and AI/ML Tech Lead Manager, Google
(Current) Co-Founder and CTO, Atmanity
Email: wasidennis@gmail.com

- **Dr. Liang-Chieh Chen**

Relationship: Internship mentor at Google Research and ByteDance
(Previous) Research scientist, Google Research and ByteDance
(Current) Senior Principal scientist, Amazon
Email: lcchen@cs.ucla.edu