Inkyu Shin | Curriculum Vitae

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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 multi-modal 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 Data-efficiency and Adaptability**
  - Learning from Synthetic Data
  - 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**
  Research Scientist — *Aug 2024 - Current*
  - Leading research on Text-to-*X* (image, video, audio) Generation
- **ByteDance / TikTok** — **San Jose, CA**
  Research Intern, Mentors: Liang-Chieh Chen and Qihang Yu — *Sep 2023 - Jan 2024*
  - Topic: Text-to-Video Generation / Editing
- **Google Research** — **LA, CA (virtual)**
  Student Researcher Intern, Mentors: Liang-Chieh Chen and Jun Xie — *May 2022 - April 2023*
  - Topic: Video Understanding / 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

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 / UR: under review / * :equal contributions)

- **[P4] Drag4D: Align Your Motion with Text-Driven 3D Scene Generation**
  Minjun Kang*, **Inkyu Shin***, Taeyeop Lee, In So Kweon Kuk-Jin Yoon

- **[P3] SCORE: Scaling audio generation using Standardized COmposite REwards**
  Jaemin Jung, Jaehun Kim, **Inkyu Shin**, Joon Son Chung
  arxiv 2025

- **[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 conjuction 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**)

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

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/Manager at Google Research and ByteDance
  (Previous) Research scientist, Google Research and ByteDance
  (Current) Senior principal scientist, Amazon
  Email: lcchen@cs.ucla.edu