

# Inkyu Shin | Research Scientist

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## Professional Summary

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**Research Impacts:** pioneered high-impact fundamental research in generative and perception AI, resulting in 15+ publications at top-tier venues (ICCV, CVPR, NeurIPS, ECCV). Key contributions include DeepFlow (ICCV 2025), a self-alignment based flow matching model that boosts training speed by 8x; Video-3DGS (TMLR 2025), the first paper to leverage 3D Gaussian Splatting for video editing to ensure temporal consistency in zero-shot editors; and pioneering work in joint audio-video generation for unified multi-modal generation.

**Industry Impacts:** proven track record of translating fundamental research into production-grade AI. At Luma AI, serve as a full-stack research scientist and engineer, driving the curation of high-quality audio-video data and building production-level audio generation and joint audio-video generation models. At ByteDance, served as a project lead for generative projects, delivering architectural breakthroughs in flow matching and 3D-aware video editing while pushing industry patents for these technologies.

## Professional Experience

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- **Luma AI** **Redwood City, CA**  
*Research Scientist / Engineer* *Nov 2025 – Present*
  - building industry-leading text-to-audio and text-to-audio-video foundation models.
  - designing data strategy and processing for audio and audio-visual datasets, building audio generation and joint audio-video generation models in large-scale.
- **ByteDance** **San Jose, CA**  
*Research Scientist* *Aug 2024 – Oct 2025*
  - project lead for generative AI research on flow-based diffusion model and video editing.
  - DeepFlow (ICCV 2025): developed a self-alignment based flow matching model for image generation, achieving an 8x training speedup compared to standard flow-based diffusion Transformers.
  - Video-3DGS (TMLR 2025): authored the first work integrating 3D Gaussian Splatting (3DGS) into video editing, drastically enhancing temporal consistency for zero-shot video editors.
- **ByteDance** **San Jose, CA**  
*Research Intern* *Sep 2023 – Jan 2024*
  - focused on text-to-video generation and editing.
- **Google Research** **Los Angeles, CA (Remote)**  
*Student Researcher Intern* *May 2022 – April 2023*
  - researched video understanding and tracking.
- **NEC Laboratories America, Inc** **San Jose, CA (Remote)**  
*Research Intern* *May 2021 – Aug 2021*
  - designed test-time adaptation for multi-modal understanding.

## Education

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- **KAIST** **Daejeon, Korea**  
*Ph.D. in Future Vehicle (Electrical Engineering)* *2021–2024*
- **KAIST** **Daejeon, Korea**  
*M.S. in Future Vehicle (Electrical Engineering)* *2019–2021*
- **Hanyang University** **Seoul, Korea**  
*B.S. in Automotive Engineering* *2013–2019*

## Publications

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(\*: Equal Contribution)

### Visual & Multi-modal Generative Modeling.....

- [1] **GeoNVS: Geometry Grounded Video Diffusion for Novel View Synthesis**  
Minjun Kang, **Inkyu Shin**, Taeyeop Lee, Myungchul Kim, In So Kweon, Kuk-Jin Yoon  
European Conference on Computer Vision (**ECCV**), 2026
- [2] **Inference-Time Scaling for Joint Audio–Video Generation**  
Jaemin Jung, Kyeongha Rho, **Inkyu Shin**, Joon Son Chung  
Transactions on Machine Learning Research (**TMLR**), 2026
- [3] **Deeply Supervised Flow-based Generative Models**  
**Inkyu Shin**, Chenglin Yang, Liang-Chieh Chen  
International Conference on Computer Vision (**ICCV**), 2025
- [4] **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
- [5] **Drag4D: Align Your Motion with Text-Driven 3D Scene Generation**  
Minjun Kang\*, **Inkyu Shin\***, Taeyeop Lee, In So Kweon, Kuk-Jin Yoon  
arXiv, 2025
- [6] **SCORE: Scaling audio generation using Standardized COmposite REwards**  
Jaemin Jung, Jaehun Kim, **Inkyu Shin**, Joon Son Chung  
arXiv, 2025
- [7] **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**)

### Additional Research (Perception, Tracking & Adaptation).....

- [8] **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
- [9] **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
- [10] **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**)
- [11] **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
- [12] **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
- [13] **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
- [14] **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 Applications of Computer Vision (**WACV**), 2023
- [15] **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
- [16] **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
- [17] **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
- [18] **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**)
- [19] **Unsupervised Domain Adaptation for Video Semantic Segmentation**  
Kwanyong Park\*, **Inkyu Shin\***, Sanghyun Woo, In So Kweon  
arXiv, 2021
- [20] **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
- [21] **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
- [22] **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**)

- [23] **Learning Representations by Contrasting Clusters While Bootstrapping Instances**  
Junsoo Lee, Hojoon Lee, **Inkyu Shin**, Jaekyoung Bae, In So Kweon, Jaegul Choo  
arXiv, 2020

## Professional Activities

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### Conference Reviewer

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

### Journal Reviewer

- TPAMI

## Awards

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