In-Hwan Jin

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RESEARCH SUMMARY

My long-term goal is to develop **Spatial Physical Intelligence**, enabling AI to understand the physical world and predict its responses to actions. I study **3D/4D scene reconstruction and generation**, particularly **Gaussian Splatting**. My work spans heterogeneous motion reconstruction and interactive environment generation. Building on this foundation, I aim to develop **physically grounded 3D/4D representations** that integrate physical structure and properties with geometry and motion to support prediction and reasoning about physical behavior.

Research Interests: 3D/4D Scene Reconstruction and Generation · Physically Grounded 3D/4D Representations

INTERNATIONAL PUBLICATIONS

(indicates equal contribution, † indicates corresponding author)*

Journal Papers

[J1] **On the Design of Mixture-of-Experts for Dynamic Gaussian Splatting**
In-Hwan Jin*, Hyeongju Mun*, Joonsoo Kim, Kugjin Yun, Kyeongbo Kong†
IEEE Transactions on Pattern Analysis and Machine Intelligence (IEEE TPAMI), 2026.
[Paper] [Project Page] [Code]

[J2] **Motion-to-Attention: Enhancing Attention Maps to Improve Performance of Text-Guided Video Editing**
Seong-Hun Jeong*, **In-Hwan Jin***, Haesoo Choo*, Hyunjun Na*, Kyeongbo Kong†
ACM Transactions on Multimedia Computing, Communications, and Applications (ACM TOMM), 2026.
[Project Page] [Code]

Conference Papers

[C1] **Counterfactual Simulation-Guided Physical Reasoning for Physics-Based Video Generation**
Sohyeong Kim*, Woohyeong Kim*, **In-Hwan Jin***, Hyeongju Mun, Kyeongbo Kong
Workshop on 3D in the Era of World Models (ECCV), 2026.
[Paper] [Project Page]

[C2] **LivingWorld: Interactive 4D World Generation with Environmental Dynamics**
Hyeongju Mun*, **In-Hwan Jin***, Sohyeong Kim, Kyeongbo Kong†
ECCV, 2026. (Acceptance Rate: 27.5%; MUSTCV Workshop Presentation)
[Paper] [Project Page]

[C3] **MoE-GS: Mixture of Experts for Dynamic Gaussian Splatting**
In-Hwan Jin*, Hyeongju Mun*, Joonsoo Kim, Kugjin Yun, Kyeongbo Kong†
ICLR, 2026. (Acceptance Rate: 28%)
[Paper] [Project Page] [Code]

[C4] **FluIDWorld: Fluid-like Interactive Dynamics for 4D Worlds**
Hyeongju Mun*, **In-Hwan Jin***, Sohyeong Kim, Kyeongbo Kong†
Workshop on World Models: Understanding, Modelling and Scaling (ICLR), 2026.

[C5] **Optimizing 4D Gaussians for Dynamic Scene Video from Single Landscape Images**
In-Hwan Jin*, Haesoo Choo*, Seong-Hun Jeong, Heemoon Park, Junghwan Kim, Oh-joon Kwon, Kyeongbo Kong†
ICLR, 2025. (Acceptance Rate: 32.08%)
[Paper] [Project Page] [Code]

[C6] **Dynamic Scene Reconstruction from Single Landscape Image Using 4D Gaussian in the Wild**
In-Hwan Jin*, Haesoo Choo*, Seong-Hun Jeong, Heemoon Park, Junghwan Kim, Oh-joon Kwon, Kyeongbo Kong†
Workshop on 3D Modeling, Reconstruction, and Generation in the Wild (Wild3D, ECCV), 2024.

[C7] **Enhancing Text-to-Video Editing with Motion Map Injection**
Seong-Hun Jeong*, **In-Hwan Jin***, Haesoo Choo*, Hyunjun Na*, Kyeongbo Kong†
Workshop on AI for Creative Video Editing and Understanding (ICCV), 2023. (Oral Presentation)

RESEARCH PROJECTS

- **Implementation of 4D Gaussian Representation Learning and View Augmentation Software**
  Funding Agency: Electronics and Telecommunications Research Institute (ETRI)
  Role: Researcher Mar. 2026 – Present
- **Implementation of High-Quality 4D Spatial Reconstruction Software Based on Multi-View Videos for Light Field Video Data Generation**
  Funding Agency: Electronics and Telecommunications Research Institute (ETRI)
  Role: Researcher Mar. 2025 – Nov. 2025
- **Implementation of 4D Spatial Representation Generation and Light Field Video Rendering Software**
  Funding Agency: Electronics and Telecommunications Research Institute (ETRI)
  Role: Researcher Aug. 2024 – Nov. 2024
- **Development of an Immersive Marine Content Production System Using Generative AI**
  Funding Agency: Foundation for Broadcast Culture (Busan MBC)
  Role: Researcher Jul. 2023 – Nov. 2024

ACADEMIC SERVICE

- Reviewer, *International Conference on Learning Representations (ICLR)*, 2027
- Reviewer, *Neural Information Processing Systems (NeurIPS)*, 2026

PATENTS

1. **Method and Apparatus for Generating Four-Dimensional Model Information**
   Inventors: Kyeongbo Kong, **In-Hwan Jin**, Haesoo Choo, Seong-Hun Jeong
   Filed: Sep. 13, 2024
   Application No.: 10-2024-0125265
   Assignee: Pusan National University Industry-University Cooperation Foundation
   Status: Technology Transferred (approx. USD 7,000)
2. **Method for Novel View Rendering Based on Multiple Gaussian Models**
   Inventors: Kyeongbo Kong, **In-Hwan Jin**, Hyeongju Mun, Joonsoo Kim, Kugjin Yun, Jinhwan Lee, Hyeongon Choo
   Assignee: Electronics and Telecommunications Research Institute (ETRI)
3. **Method and Apparatus for Generating a 4D Scene from a Single Image**
   Inventors: Kyeongbo Kong, **In-Hwan Jin**, Hyeongju Mun, Sohyeong Kim
   Filed: Jan. 8, 2026
   Application No.: 10-2026-0003755
   Assignee: Pusan National University Industry-University Cooperation Foundation