Jinhyung Ahn

ajhh98@yonsei.ac.kr Jinhyung Ahn jinjinjinnn.github.io Jinjinjinnn

Education

Yonsei University Mar. 2023 – Present
B.S. in Computer Science, ***B.A.*** in Philosophy *Seoul*
GPA: 4.14 / 4.5

Capilano University Sep. 2019 – Apr. 2020
Diploma in Digital Visual Effects *Vancouver, BC*
GPA: 4.21 / 4.33, one year completed

Research Interests

My current research interests lie in **Physics-based Computer Graphics**, with a specific goal of connecting classical numerical methods with deep learning for **fluid and deformable body simulations**.

- **Neural-Enhanced Fluid Dynamics**: Accelerating pressure solvers by replacing pressure projection steps with learned neural operators.
- **Differentiable Deformable Simulation**: Developing neural constitutive models to simulate complex elastoplastic materials efficiently.
- **Physics-Informed Dynamics Learning**: Inferring latent physical properties from visual observations to extrapolate future states of fluids and deformable bodies.

Experience

Joycity, ***industry-academia scholarship*** Dec. 2025 – Present
Research Intern

- Developed human-like multi-agent players for Freestyle1, a 3-on-3 half-court basketball online game, using online multi-agent PPO; independently led the offline RL track based on a multi-agent diffusion model (MADIFF).
- Built a VideoQA pipeline using vision-language models (Qwen3-VL) that distinguishes AI from human gameplay and localizes non-human-like behavior to guide further development.

Media Lab, Korea University July 2025 – May 2026
Research Intern (Advisor: Prof. Junghyun Han)

- Implemented baseline SPH solvers (IISPH, DFSPH, PBF) and simulation features used for comparison experiments in [1].
- Ran ablation and comparison experiments and prepared result figures for [1], and contributed to the experimental results section.
- Contributed to the Taichi-to-NVIDIA Warp GPU port and to an SPH-based deformable solid solver.

Yonsei Artificial Intelligence Club (YAI) July 2024 – Present
Vice President & Mentor

- Co-organized club operations and planned semester events while developing the technical curriculum.
- Led and participated in an academic paper reading group covering deep learning, 3D vision, and graphics-integrated AI.
- Presented two 3D reconstruction projects, CGMaker with sparse 3DGS and MVDGS, at the YAI-Conference (YAICON).
- Mentored junior members on deep learning fundamentals and guided toy projects through feedback, debugging support, and code reviews.

BlendED AI+X Global Talent Community Mar. 2025 – Nov. 2025
Selected Participant

- Led Gaussian SPH Fluid, integrating an SPH solver into 3D Gaussian Splatting to build a physics-integrated reconstruction-to-simulation pipeline.
- Led VQ-ViT Convolutional Fusion for anomaly detection/localization, integrating a convolutional prior with VQ-VAE and Vision Transformer representations.

Publications

[1] **Implicit velocity projection method for incompressible SPH fluids**
Minhyung Kee, **Jinhyung Ahn**, Sehyeon Park, Kiwon Um, Junghyun Han.
ACM SIGGRAPH Asia, 2026

Research Projects

Gaussian SPH Fluid
Aug. 2025 – Oct. 2025

Team Lead & Developer (Advisor: Yifei Li, PhD Candidate)

- Built an end-to-end pipeline that maps reconstructed 3D Gaussian splats to SPH particles, simulates them with a GPU Taichi DFSPH solver, and renders frames back in the same Gaussian representation.
- Implemented SPH-consistent initialization via interior uniform particle filling and standardized execution with single-JSON configs.
- **Technical Stack:** Python, PyTorch, Taichi, Blender

MVDGS: Multi-view Diffusion Gaussian Splatting
Apr. 2025 – June 2025

Core Contributor & Developer ***3rd Place at 6th YAICON***

- Integrated CameraCtrl as pose-conditioned guidance into DreamGaussian to improve human-centric 3D reconstruction with pose-aware frontal conditioning.
- Implemented CameraCtrlGuidance and wired an end-to-end training schedule mixing Zero123 and CameraCtrl.
- **Technical Stack:** Python, PyTorch, Blender

VQ-ViT Convolutional Fusion
Mar. 2025 – May 2025

Team Lead & Developer (Advisor: Dr. Alex Benjamin) ***Selected Grant***

- Led a hybrid OCT anomaly detection and localization model that fuses frozen ViT features with frozen VQ-VAE codes by training a convolutional prior to predict codebook indices, producing pixel-level NLL anomaly maps.
- Implemented end-to-end training, inference, and evaluation with comparison baselines and localization visualizations such as attention rollout and alignment-loss maps.
- **Technical Stack:** Python, PyTorch

CGMaker with sparse 3DGS
Nov. 2024 – Dec. 2024

Team Member & Developer ***1st Place at 5th YAICON***

- Built a two-view sparse 3D reconstruction pipeline that estimates camera intrinsics and extrinsics, interpolates novel viewpoints, and runs MVSplat per frame to render a temporally consistent sequence, with optional downstream text-guided video editing.
- Contributed data and camera preprocessing by converting DUSt3R outputs to COLMAP, generating novel camera trajectories, and building visualization utilities for consistent view sampling during reconstruction.
- **Technical Stack:** Python, PyTorch, Blender

Honors and Awards

1st Place, 5th YAICON (YAI-Conference) — Dec. 2024
Project: CGMaker with sparse 3DGS

3rd Place, 6th YAICON (YAI-Conference) — June 2025
Project: MVDGS: Multi-view Diffusion Gaussian Splatting

Selected Grant, BlendED AI+X Global Challenge Summit — Dec. 2025
Selected for public showcase and prize award for VQ-ViT Convolutional Fusion

Grant Recipient, IHEI WORKSTATION Program — Apr. 2025
Funded for **Zoo Out!**, a Unity mobile game developed as a social innovation project.

Veritas Scholarship (Merit-based), Yonsei University — Dec. 2024
Merit scholarship awarded for academic performance

Skills

Programming: Python, C++, C#, Java, JavaScript

Frameworks: PyTorch, NVIDIA Warp, Taichi, Maya, Houdini, Blender, Unity, Unreal Engine

Languages: Korean (Native), English (TOEFL iBT 106/120)