

Hee Chan Yoon

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<https://harryyoon777.github.io/>

RESEARCH INTERESTS

Computer Graphics: Differentiable Rendering and Simulation

EDUCATION

University of Maryland, College Park

Maryland, US

M.S. in Computer Science

Aug 2024 — Present

Overall GPA : 3.78/4.0

Kyung Hee University

Yongin-si, South Korea

B.Eng. in Computer Science and Engineering

Mar 2021 — Feb 2024

Overall GPA : 3.9/4.3 Major GPA : 3.9/4.3

Chungbuk National University

Chung-cheong bukdo, South Korea

Mechanical Engineering

Mar 2017 — Feb 2021

Overall GPA : 4.25/4.5 Major GPA : 4.29/4.5

PUBLICATIONS

- DRiFT: Differentiable Grid-Based Rigid-Fluid Coupling for Training and Control
Shrey Patel, Samuel Audia, **Hee Chan Yoon**, Bo Zhu, Rahul Narain, Ming Lin.
Submitted to ICLR, 2026.
- Internal-External Boundary Attention Fusion for Glass Surface Segmentation
Dongshen Han, **Hee Chan Yoon**, Hyukmin Kwon, Hyun-Cheol Kim, Hyon-Gon Cho, Seungkyu Lee, Chaoning Zhang.
Neural Networks, 2025.
- Neural Radiance Fields for Transparent Object Using Visual Hull
Hee Chan Yoon, Seungkyu Lee.
IEEE International Conference on Big Data and Smart Computing, 2024.
- Virtual Puppet Control using 2D Video Hand Tracking and Facial Emotion Recognition
Jueun Mun*, Gangyun Go*, **Hee Chan Yoon***, Yaewon Han*, Seungkyu Lee.
Korean Information Science Society Conference, 2022.

RESEARCH EXPERIENCE

University of Maryland

Maryland, US

Differentiable Surfel Rendering

May 2025 — Present

with Prof. Matthias Zwicker

- Working on 3D scene reconstruction using a physics-based differentiable rendering technique with opaque surfels

Differentiable Rigid-Fluid Coupling Simulation Using an Adaptive Mesh

Jun 2025 — Present

with Prof. Ming Lin

- Developing a differentiable fluid–solid coupling simulator using adaptive mesh refinement for accurate fluid–solid interaction and RBF-FD for efficiently handling T-junctions
- Deriving analytical gradients using the adjoint method

Perception and Computer Vision Laboratory, Kyunghee University Yongin-si, South Korea

Advisor: Prof. Seungkyu Lee

Jan 2022 — Feb 2024

- Neural radiance fields for transparent object using visual hull
 - Developed a physics-based method to represent a scene containing transparent object using NeRF
- Transparent objects segmentation and reflection removal
 - Analyzed the effect of patch resolution on reflectance prior estimation
 - Designed spatial weight maps in cross entropy loss to emphasize pixels near the transparent boundaries

COURSE PROJECTS

GPU Accelerated PIC/FLIP Simulation Feb 2025 — May 2025

- Developed a high performance CUDA-based PIC/FLIP fluid simulation for 1 million particles, resulting in approximately $30\times$ faster computation compared to CPU implementation.

Aris-Renderer Sep 2024 — Dec 2024

- Implemented null-scattering volumetric path tracer, multiple path tracers, dielectric material, and micro-facet BRDF in Python and Pytorch

Doppler Time-of-flight Rendering Oct 2024 — Dec 2024

- Re-implemented Doppler ToF rendering in C++ and Mitsuba3

Improved Visual Hull Sep 2023 — Dec 2023

- Resolved incorrect reconstruction resulting from inaccurate mask images by assigning a probability to each voxel in C++

RELEVANT COURSEWORK

Graduate Courses

- Differentiable Programming - Fall 2025
- Physically-based Modeling, Simulation & Animation - Spring 2025
- Advanced Computer Graphics - Fall 2024
- Computational Imaging - Fall 2024

Undergraduate Courses

- Computer Graphics
- Machine Learning

SKILLS

- **Programming:** C/C++, CUDA, Python
- **Software:** Mitsuba, OpenGL, Blender