

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

M.S. in Computer Science

Overall GPA : 3.78/4.0

Maryland, US
Aug 2024 — Present

Kyung Hee University

B.Eng. in Computer Science and Engineering

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

Yongin-si, South Korea
Mar 2021 — Feb 2024

Chungbuk National University

Mechanical Engineering

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

Chung-cheong bukdo, South Korea
Mar 2017 — Feb 2021

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

Differentiable Surfel Rendering

with Prof. Matthias Zwicker

Maryland, US

May 2025 — Present

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

Differentiable Rigid-Fluid Coupling Simulation Using an Adaptive Mesh
with Prof. Ming Lin

Jun 2025 — Present

- 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
<i>Advisor: Prof. Seungkyu Lee</i>	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