JaeHyun Lee

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RESEARCH INTERESTS

Computer Graphics, Physics-Based Animation, Deformable bodies, Fluids, Coupling, Scientific Computing, Numerical methods, Optimization

EDUCATION

Korea University — Seoul, Republic of Korea

M.S. in Computer Science and Engineering — *Sep. 2021 – present*

- Advised by Prof. JungHyun Han
- GPA: 3.93/4.0

Korea University — Seoul, Republic of Korea

B.S. in Computer Science and Engineering (Double major) — *Mar. 2019 – Feb. 2021*

B.S. in Mechanical Engineering — *Mar. 2015 – Feb. 2021*

- Including 2 years of military service
- GPA: 3.98/4.0
- **Graduated with Great Honor** ***(Summa Cum Laude)***

PUBLICATIONS

- Seung-wook Kim, **JaeHyun Lee**, HuiSeong Lee, Kiwon Um, JungHyun Han. "Dimension Expansion for Mass-spring Simulation of Elastic Body." (Submitted) [paper] [video]
- Heejo Jeong, Seung-wook Kim, **JaeHyun Lee**, Kiwon Um, Min Hyung Kee, JungHyun Han. "Momentum-preserving inversion alleviation for elastic material simulation." In Computer Animation and Virtual Worlds (CAVW), Vol. 35, No. 3, May 2024, pp. e2249. [paper]
- **JaeHyun Lee**, Seung-wook Kim, Kiwon Um, Min Hyung Kee, JungHyun Han. "Inversion alleviation for stable elastic body simulation." In Computer Animation and Virtual Worlds (CAVW), Vol. 34, No. 3-4, May 2023, pp. e2183. [paper] [video]

RESEARCH AND PROJECT EXPERIENCE

Energy conservation for Material Point Method (MPM) — Korea University

Researcher — *Oct. 2023 – present*

- Developed C++, CUDA-based state-of-the-art MPM framework, with visualization system using OpenGL. [code]

LG Electronics: Air Conditioning Airflow Simulation Visualization System — Korea University

Project Assistant — *Mar. 2022 – Aug. 2022*

- Contributed to the project by implementing Python-based, GPU-accelerated real-time airflow simulator visualized with volume rendering. The project won the **first prize** among 489 teams. [code] [video]

Collision Detection for Constrained Projective Dynamics (CPD) — Korea University

Reasearcher — *Dec. 2020 – May. 2021*

- Implemented tetrahedral collision detection module for ACM Transactions on Graphics 2021 paper titled 'Constrained Projective Dynamics: Real-Time Simulation of Deformable Objects with Energy-Momentum Conservation'. [paper] [video] [code]

TEACHING

Computer Graphics — Korea University

Teaching Assistant — *Spring 2022*

- Teaching Assistant for COSE331 Computer Graphics at Korea University. (Instructor: Prof. JungHyun Han)

SCHOLARSHIPS

Special Scholarships, Korea University — *Spring, Fall 2018*

National Science and Engineering Scholarship, Ministry of Science and ICT — *Spring 2019 – Fall 2020*

Research Scholarships, Korea University — *Fall 2021, Fall 2022*

Kwanjeong Educational Foundation Scholarship, Kwanjeong Educational Foundation — *Spring 2022 – Fall 2023*

Teaching Assistant Scholarship, Korea University — *Spring 2022*

HONORS AND AWARDS

Semester High Honors, Korea University — *Spring 2017 – Spring 2020*

Dean's List, Korea University — *Spring 2018*

President's List, Korea University — *Fall 2018 – Spring 2019*

Great Honor, Korea University — *Graduation*

Best Research award, Korea Electronics Association — *Feb 2022, Dec 2022, Aug 2023*

Best Industry-Academic Project Award, Ministry of Trade, Industry and Energy — *Nov 2023*

TECHNICAL SKILLS

Languages: C/C++, Python, Java

APIs: OpenGL, CUDA, OpenMP

Other Tools and Libraries: Git, Eigen, Partio, ImGui, Assimp, PyTorch, Fusion360, CMake, Taichi Lang, Blender

LANGUAGE LEVEL

Korean: Native

English: Fluent