Dahyun Joo

+82-10-2647-9797 | clairda@snu.ac.kr | springfall137.github.io
Republic of Korea | DOB: Aug 28, 2000 | Marital Status: Single

Education

Seoul National University 2025 – Present
M.S. Course, Mechanical Engineering

- AI-driven Simulation and Design Lab (Principal Investigator: Prof. Do-Nyun Kim)

Seoul National University 2019 – 2025
B.S. Physics (Minor: Mechanical Engineering), ***Cum Laude***

- Thesis: *wPINNs: Enhancing Physics-Informed Neural Networks with Wavelet Activation Functions*

Chungnam Science High School 2016 – 2019
R&E at Physics Student Group, ***Valedictorian***

Saerom Middle School 2015 – 2016

American School of Yaoundé – 2015

Research Experience

M.S. Researcher Mar 2025 – Present
SNU AI-driven Simulation and Design Lab (Prof. Do-Nyun Kim)

- Develop **reusable kirigami-based impact absorbers** by engineering **bistability / snap-through** and geometry-driven **energy absorption** for repeatable deformation without material damage.
- Build simulation-to-design pipelines (e.g., **FEA**, parametric modeling, optimization loops) to map pattern parameters to force–displacement response and impact performance.
- Investigate **quantum-enhanced topology optimization** by integrating **variational quantum circuits** with classical solvers to accelerate design-space exploration under mechanical constraints.

Undergraduate Research Intern Sep 2024 – Jan 2025
SNU MetaStructure Lab (Prof. J. H. Oh)

- Studied **waves and metamaterials** via **acoustic finite element methods** and numerical analysis.
- Supported **AI-driven topology optimization** by preparing simulation cases, organizing results, and iterating candidate designs.

Undergraduate Research Intern Oct 2023 – Jan 2024
SNU Transformative Architecture Laboratory (Prof. J. K. Yang)

- Simulated **deployable bistable dodecahedral origami** to support fabrication feasibility; performed **FEA in Abaqus**.
- Summarized assumptions and key outcomes to guide design iteration and production planning.

Projects

Samsung Display 2025.03 – 2026.02
Bistable Kirigami Integration for Curved Display Corner

- Integrated a **bistable kirigami pattern** into curved-display corner regions to enable controlled shape transition and robustness under constrained geometry.
- Iterated pattern parameterization and stability-focused analysis to satisfy corner curvature and boundary constraints; prioritized manufacturability and repeatable behavior.

LG Electronics 2025.06 – 2025.09
Kirigami-Enhanced Pulp-Mold Packaging for Impact Absorption

- Applied **kirigami patterns** to **pulp-mold packaging** to increase deformation stroke and improve energy absorption without adding bulk material.
- Developed practical pattern guidelines considering pulp-mold forming constraints; summarized expected mechanical behavior and prototyping directions.

Awards

Semiconductor Solverton Competition Top Prize 2024
- Deputy Prime Minister and Education Minister Prize.
- Optimized AC performance of GAA NS FET via structural modeling and process-driven device design; analyzed resistance, capacitance, and frequency gain vs. FinFET; proposed enhanced design via TCAD.

Seoul National University Semiconductor Specialized College Scholarship 2024

Korean History Proficiency Test (Level 1, 100/100) 2022

ROKAF Entrepreneurship Contest: Advanced to MND Finals 2022

Excellent Private Award 2021
- Granted by ROK Air Force Information Communication School Principal (Col.).

Certificate of Completion: Startup Investment Education 2020
- Issued by SNU Entrepreneurship Center.

Excellent Student Award 2019
- Granted by Chungcheongnam-do Federation of Teachers' Association.

Seminar

Seminar Instructor (Reinforcement Learning) Jan 2024
SNU BI Lab (Prof. Byungtak Jang)
- Delivered a seminar on **reinforcement learning in classic games** (e.g., **Chess**, **Go**), summarizing milestone systems and why self-play enabled rapid performance scaling.
- Explained the game-theoretic foundations underlying modern RL: **minimax** decision-making, **Nash equilibrium**, and how these connect to policy/value learning in adversarial settings.

Work Experience

Intern — STATION F 2025.02

Intern — Thales Korea 2024.03 – 2024.07

Working Scholar — SNU Gwanak Residence Halls Administrative Office 2024.01 – 2024.02

Content Creator — `@biztorang` & `@jjuvoyager` 2022.10 – Present

Sergeant (Completed Service) — Republic of Korea Air Force (15th Weather Squadron) 2021.07 – 2023.04

President of Student Council — SNU Department of Physics and Astronomy 2020.11 – 2021.07

Working Scholar — Center for Theoretical Physics, SNU Department of Physics and Astronomy 2020.03 – 2021.06

Brand Owner / Online Retail Sales — `jjooda` & `DogodoNongwon` 2020.04 – 2023.05

CFD Engineer — Rocket pre-startup `Kspace` (Injector Design) 2019.12 – 2020.02

Skills

Languages: Korean (Mother tongue), English (Fluent: TOEFL 104), French (Good: DELF A2)
Programming: C, Python, MATLAB, R
Engineering Software: ANSYS, NX, STAR-CCM+, Abaqus, SolidWorks, COMSOL Multiphysics