Sun-jae Lee

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in Sun jae Lee | satelite2517-repo

Seoul, South Korea

RESEARCH INTEREST

MHD, Stability, Negative triangularity, High performance computing, Artificial Intelligence(AI)

EDUCATION

• Seoul National University

Mar 2026 -

Department of Energy Resources Engineering

Seoul, Korea

o M.S. Candidate, Nuclear Engineering

Seoul National University

Mar 2021 - Feb 205

Seoul, Korea

College of Liberal Studies

Visiting Research Student

• B.S., Computer Science and Engineering Major

• B.S., Physics Program Major

EXPERIENCE

• Princeton Plasma Physics Laboratory (PPPL)

Jul 2025 - Aug 2025

Princeton, NJ, USA

• Selected as one students for the SNU-PPPL joint research program on 3D fusion plasma physics

Dept. of Nuclear Engineering, Seoul National University

Sep 2023 – Present

Undergraduate Research Assistant

Seoul, Korea

Advisor: Prof. Jong-Kyu Park

- Utilized GPEC and DCON simulations to compare kinetic stabilization effects in PT vs. NT tokamaks and analyzed radial profiles of perturbed equilibria
- Utilized GPEC and DCON simulations to compare kinetic stabilization effects in PT vs. NT tokamaks

Advisor: Prof. Young-Suk Hwang

- Built a reproducible data pipeline for VEST tokamak by integrating diagnostics, EFIT-CHEASE-GPEC workflow, and Python-based tools compatible with IMAS and HSDS
- Developed a Python package to automate data processing and visualization for VEST experiments, enhancing research efficiency and collaboration

• Dept. of Energy Resources Engineering, Seoul National University

April 2022 - Dec 2022

Undergraduate Research Participant

Seoul, Korea

Advisor: Prof. Jin soo Kang

 Participated in electrochemical lithium recovery experiments using CDI methods and evaluated system scalability by comparing theoretical and actual Li-ion recovery efficiency

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, R=IN REVIEW, S=IN SUBMISSION, T=THESIS

[†] These authors contributed equally to this work.

PRESENTATIONS

P=Poster presentation, O=Oral presentation, A=Abstract

- [P.4] Sunjae Lee, et al. (2025)."Kinetic stability of negative-triangularity plasmas". 67th Annual Meeting of the APS Division of Plasma Physics, Long Beach, California USA (Nov, 2025)
- [P.3] Sunjae Lee, et al. (2025). "Kinetic stability of negative-triangularity plasmas". 29th Workshop on MHD Stability Control, Princeton, New Jersey, USA (July, 2025)
- [P.2] Sunjae Lee, et al. (2025). "Standardized Data Infrastructure for Tokamak: Implementation in VEST (Versatile Experiment spherical tokamak)". 2025 Spring meeting of the Korean Physics Society, Seoul, Korea (April, 2025)
- [P.1] Sunjae Lee, et al. (2024). "Improvements of database system and analysis suite in VEST". 3rd International Fusion and Plasma conference (IFPC), Seoul, Korea (June 2024)

PROJECTS AND AWARDS

Perturbed Equilibrium Code Hackathon – Columbia Fusion Research Center

Jul 2025

Tools: Julia, GPEC (reference), Plasma Physics Modeling

Collaborative Hackathon Project

- Will participate in a 3-day intensive hackathon to reproduce key functionalities of the GPEC equilibrium and response simulation package in Julia
- · Collaborate with undergraduate and graduate students to implement open-source plasma stability tools
- Focus on real-time performance and software modularity for physics-informed code design in fusion simulation

High-Performance CUDA Programming Project – Accelerator Programming Summer School Tools: CUDA, NVIDIA GPU, Nsight, C++

June 2024

- o Completed program focused on GPU acceleration and CUDA optimization techniques at SNU
- Developed CUDA-based performance tuning project in 2-person team, including kernel design and profiling

Text-to-Image Generation using Conditional GAN – 2023 OUTTA Deep Learning Bootcamp Tools: PyTorch, Conditional GAN, Google Colab

Jun 2023 - Aug 2023 2nd Prize Winner

- Built a text-to-image generation model using conditional GAN architecture
- Presented final results at bootcamp showcase and awarded 2nd prize among top-university teams

"Pairing" – SKYCC Hackathon

May 2023

Tools: Node.js, MongoDB, AWS, Slack API

Selected for Best Idea

- · Developed backend infrastructure for a web app; Designed data model and REST API endpoints using Node.js and MongoDB, deployed via AWS
- o Collaborated in a hackathon supported by AWS, Elastic, and Slack Korea

LEADERSHIP EXPERIENCE

Teaching Assistant

Sep 2025 - Dec 2025

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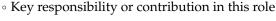
Seoul National University, Computer Architecture

- Key responsibility or achievement in this role
- Quantifiable impact or improvement made during tenure

VOLUNTEER EXPERIENCE

 Volunteer Role A Month Year - Month Year

Organization Name



Impact of your volunteer work

Skills developed or applied during this experience

SKILLS & ADDITIONAL INFORMATION

- Programming Languages: Python, C/C++, Fortran, Java, Linux, CUDA, MATLAB, OpenCL, MPI / OpenMP
- Simulation Tools: DCON, GPEC
- TOEFL iBT Score: 102/120 (Reading 26, Listening 28, Speaking 25, Writing 23)

