Chaewon Baek

Curriculum Vitae

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Research Interests

Design and Control of Origami-inspired Mechanism
Bio-inspired Mechanism
3D Printing

Education

Seoul National University Seoul, Republic of Korea
B.S., Mechanical Engineering *Feb. 2019 - Present*
B.S., Electrical and Computer Engineering *Aug. 2020 - Present*

- Current GPA: 3.86/4.3, Major GPA: 4.11/4.3
- ∗ *2021-2023: Mandatory Military Service (ROK Army)*

Daegu Science High School(DSHS) Daegu, Republic of Korea
High School for gifted students in science *Mar. 2016 - Feb. 2019*

Research Experience

Japan Aerospace Exploration Agency(JAXA) Sagamihara Campus, Japan

- Institute of Space and Astronautical Science(ISAS)
  - Student Practical Training System(Advisor: Prof. Hiromi Yasuda) *Aug. 2024*
    - Learned numerical analysis techniques to model and analyze origami-based deployable structures
    - Held a presentation on size dependent behaviors of Miura-Ori based structures
    - Attended Symposium: Origami Bridging Art, Science & Industry 2024 (Supported by Japan Origami Academic Society, Art Center, the University of Tokyo)

Seoul National University Seoul, Republic of Korea

- Applied Superconductivity Laboratory
  - Undergraduate Researcher(Advisor: Prof. Seungyong Hahn) *Jan. 2024 - Present*
    - Designed a minimized railgun system
- Transformative Architecture Laboratory
  - Undergraduate Researcher(Advisor: Prof. Jinkyu Yang) *Sep. 2023 - Present*
    - Designed, fabricated and analyzed a robot leg with bistable features inspired by origami Leaf-out structure
    - Analyzed the directional stiffness and poisson's ratio of Miura-Ori structure (Supported by Seoul Nat'l Univ Student-Directed Education Undergraduate Research Program through the Faculty of Education, Received 5000$)
- Biorobotics Laboratory
  - Undergraduate Researcher(Advisor: Prof. Kyu-Jin Cho) *Dec. 2020 - Sep. 2021*
    - Designed and fabricated a control mechanism of origami flasher model for drone perching and climbing mechanism
    - Developed a compact wall-climbing platform using rotary microspine structure and suction cup

Publications

(In preparation)

C. Baek, H. Yasuda, and J. Yang, "Size Dependent Behaviors of Miura-Ori Structure", (Targeting *Physical Review Letters, Nature Communications*).

Teaching Experience

Seoul National University Seoul, Republic of Korea

- 2024 Physics Self-Paced Learning & Tutoring for Freshmen Course Mentor
  - Innovation Center for Engineering Education of Seoul Nat'l Univ. *Dec. 2023 - Feb. 2024*
- Undergraduate Course Assistant
  - M2794.001300 Fluid Mechanics *Sep. 2023 - Dec. 2023*

Other Experiences

Seoul National University Seoul, Republic of Korea

- SNU Tomorrow's Engineers Membership (STEM)
  - Honor Society in College of Engineering *Oct. 2024 - Present*
    - Director of Academic Department
    - Held multiple seminars on Applications of Origami in Engineering
- Seoul National University Formula SAE Team
  - Seoul National University Formula SAE Powertrain Team Leader *Aug. 2020 - Sep. 2021*
    - Designed, constructed the team's first Formula racecar's overall powertrain system from scratch
    - Held seminar on Finite Element Analysis and Topology optimization using Solidworks
    - Made a program that optimizes differential gear & turnbuckle system to minimize the chain tension and the load to individual parts using Matlab
- Seoul National University Baja SAE Team
  - Seoul National University Baja SAE Team Member *Mar. 2019 - Jul. 2020*
    - Participated in the construction of the Baja Racecar as a team member

National Academy of Engineering of Korea Seoul, Republic of Korea

- Young Engineers Honor Society (YEHS)
  - Young Engineers Honor Society 2024 Member *Jan. 2024 - Present*
    - Attended the 271st NAEK Forum on Jan. 22, 2024 as a member of the YEHS, National Academy of Engineering of Korea

Scholarships

Semiconductor Scholarship, Seoul National University, 2024
Sinyang Cultural Foundation Scholarship, Sinyang Cultural Foundation, 2024
Merit-based Scholarship, Seoul National University, 2020, 2021, 2023
Local Talent Scholarship, Kimcheon Human Resources Development Foundation, 2021

Awards

Ministerial Award from the Ministry of Education 2024
Korea Institute for Advancement of Technology (KIAT)
Won second place in nationwide Semiconductor Solve-a-thon

Outstanding B.S. Thesis Presentation Award 2024
Department of Mechanical Engineering, Seoul National University
Best presentation award

Grand Prize 2023
Department of Mechanical Engineering, Seoul National University
Awarded for designing a music stand that automatically turns the pages in 'Mechatronics' Course

Creativity Award 2019
Department of Mechanical Engineering, Seoul National University
'Creative Engineering Design' Course

Technical Skills

Programming: Python, C, C++, Matlab, LaTeX
CAD/Simulation: Solidworks, Fusion360, Autocad, Altair, KiCAD, TCAD, LTSpice, Paraview
Languages: English(Fluent, TOEIC: 990, TOEFL: 109), Korean(Native)