SUNIN BAEK

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EDUCATION

Korea University, Seoul   *2025 - Present*
M.S. in Mechanical Engineering

Korea University, Seoul   *2018 - 2025*
B.S. in Mechanical Engineering
B.S. in Medical Convergence Engineering

EXPERIENCE

Movement Intelligence Laboratory   March 2025 - Present
Graduate Researcher (Advisor: Prof. Daekyum Kim)

· Developing an adaptive ankle exoskeleton control system using real-time physiological data and preference-based learning to adjust torque for personalized mobility assistance.

Movement Intelligence Laboratory   November 2023 - February 2025
Undergraduate Researcher (Advisor: Prof. Daekyum Kim)

· Implemented a multimodal sensor fusion system using IMU, ECG, EMG, PPG, FSR, RGB Camera, and etc.
· Developed a deep learning framework using open-source IMU data for lower-limb joint kinematic estimation.
· Designed a compact, torque-controllable ankle exoskeleton for walking assistance with modular sensor integration.

ROKAF Air Defense Control Command, Osan AB   October 2020 - July 2022
Staff Sergeant (Aviation Control)

· Managed confidential intelligence reports, identified potential tactical threats, and analyzed the findings for high-level command decisions.

PUBLICATIONS

[**J1**]   B. Hur, **S. Baek**, I. Kang, and D. Kim, *"Learning-Based Lower Limb Joint Kinematic Estimation Using Open Source IMU Data,"* Scientific Reports, 15(1), 2025, 5287.

HONORS & AWARDS

KU Veritas Scholarship   2024
Creative Challenger Program Research Grant

Excellence Award, KAP Future Automotive Industry Idea Contest   2024
Project: 3D Driver Pose Estimation Using Pressure Sheets

SW · AI Award(2nd Place), KU AI Forum   2024
Title: Vision-Language Model based Walking Environment Recognition

Finalist, KU Capstone Design Fair   2023
Project: Robotic Self-Navigating Solar-Powered Cube Vessel

Certificate of Academic Excellence(1st Place)   2020
ROKAF Information & Communication School

TEACHING

(MOBI104) *How things work*   Fall 2024
Teaching Assistant

(MOBI203) *Data Structures and Algorithms*   Spring 2025
Teaching Assistant

TECHNICAL SKILLS

Programming Languages	Python, C, C++, MATLAB
Software Experiences	Fusion 360, ROS, OpenCV, TensorFlow, Pytorch, imufusion LabStreamingLayer, Upper Computer(CubeMars), Arduino IDE, OpenPose, DeepLabCut, OpenSim, OpenCap, RealSense SDK, YOLO, CLIP, LaTeX
Languages	Korean(Native), English(Fluent), Spanish(Elementary)

EXTRACURRICULAR ACTIVITIES

LINC 3.0 KU Entrepreneurial Club, A_BOUT   April 2023 - October 2023
Project Leader

· Funded by the *Crimson Startup Institute* and the *KU Pioneer Village π-Ville 99 Studio*.
· Developed a full-scale vessel that successfully crossed the Han River.
· Optimized the Han River's waterway infrastructure using public data for demand forecasting and terminal selection; presented at the KUBS CDTB Data Analysis Contest.

KU School of Mechanical Engineering, Student Council   May 2018 - December 2019
32nd & 33rd

· Organized and led student welfare initiatives while also planning, promoting, and managing school and departmental events.

KU Rotaract Club(Community Service & Leadership)   March 2018 - November 2019
External Affairs Executive

· Orchestrated volunteer engagements at local facilities like 한국생명의전화종합사회복지관 (Social Welfare Center) and 승가원 (Disability Welfare Center), bolstering community relations and support.