KYOUNGMO KOO

kmkoo@umich.edu | Apt 642, Ann Arbor, Michigan, United States | +1 734 730 9403 | Homepage | LinkedIn | Github

EDUCATION

University of Michigan, Ann Arbor, MI — Jun 2025 (Expected)
Master of Science in Electrical & Computer Engineering
- Cumulative GPA: 4.00/4.00
- Relevant Coursework: Linear System Theory, Nonlinear System & Control, Robotic Kinetic Dynamics

Seoul National University, Seoul, KR — 2023
Bachelor of Science in Electrical & Computer Engineering
- Cumulative GPA: 3.86/4.30
- Relevant Coursework: Design Project for Electrical Devices & Systems, Digital Logic Design, Digital Integrated Circuits, Semiconductor Devices, Signals and Systems, Introduction to Communications, Electromechanics

RESEARCH INTERESTS

- Embedded Systems, Control, Communication Protocols, Electrical Devices, and Robotics

RESEARCH EXPERIENCES

Image-Guided Medical Robotics Lab, University of Michigan, Ann Arbor, MI — Aug 2023 - Present
Research Assistant, Electical & Computer Engineering Group (Prof. Mark Draelos)
- Designed and developed a Galvanometer controller to enhance the quality of Optical Coherence Tomography (OCT) scan on an STM32L476RG board using C and STM32CubeIDE
- Implemented stable, real-time bidirectional communication operating at a 50 kHz frame rate, using SPI, SAI, UART, and TIM interface, considering timing diagram and synchronization with laser trigger signal
- Utilized Direct Memory Access (DMA) and callback functions for independent operation management

Seoul National University, Seoul, KR — 2021 – 2023
Research Intern, Applied Superconductivity Lab (Prof. Seungyong Hahn)
- Designed internal circuitry of superconductivity-applied electromechanical devices using MATLAB, LTSPICE, and COMSOL Multiphysics
- Conducted simulations and experimental studies on a no-insulation high-temperature superconductor (NI HTS) applied magnetohydrodynamic (MHD) ship – the world's first of its kind
- Proposed use cases for a 10kW-scale wave energy converter design incorporating NI HTS considering mechanical, thermal, and electromagnetic stability

PUBLICATIONS

- "Reducing Cost but not Quality with Digital Scanner Interfaces for Optical Coherence Tomography",
  Kyoungmo Koo, Lucia Lee, Morgan McCloud, and Mark Draelos, SPIE Photonics West 2025, Submitted (abstract)

- "Design, Construction, and Operation of Liquid Nitrogen Cooled MHD Miniature Ship with No-Insulation High Temperature Superconductor Magnet",
  Kyoungmo Koo*, Chaemin Im*, Geonyoung Kim, Jaemin Kim, Seungyong Hahn, *IEEE Transactions on Transportation Electrification*, Accepted (paper)

- "Conceptual Design and Analysis of No-Insulation High- Temperature Superconductor Tubular Wave Energy Converter",
  Kyoungmo Koo, Wonseok Jang, Jeonghwan Park, Jaemyung Cha and Seungyong Hahn, *ArXiv* (paper)

WORK EXPERIENCES

BorgWarner Inc., Kokokmo, IN May – Aug 2024
Embedded System Intern, e-Hardware Architecture Team
- Developed user interfaces (UIs) utilizing a keypad and OLED display connected to an FPGA board via the SPI bus.
- Integrated various functional blocks and enabled digital signal processing using Verilog/VHDL in the Vivado environment.
- Participated in designing a circuit prototype and PCB board to optimize signal performance for users.
- Defined system stability by analyzing various battery waveforms, current and temperature of an electric motor controller in time domain using multimeter, microprocessors, and digital data logger.

Michigan Autonomous Aerial Vehicles (MAAV), Ann Arbor, MI Aug – Oct 2023
Firmware Developer, Embedded System Team, Student-led organization
- Participated in design of autonomous aerial vehicle for the International Aerial Robotics Competition (IARC)
- Designed PCBs with microprocessors and sensors using Altium and STM32 Cube IDE
- Acquired proficiency in microprocessor GPIOs and interfaces, enhancing communication protocols utilized in drone

Snek, Seoul, KR Apr – Jun 2021
Marketing & Data Analyst Intern
- Conducted an in-depth analysis of spending patterns among premium users using Python to enhance the conversion rate
- Proposed a data-driven strategy for targeted Google advertisements, focusing on potential customers to create user traffic

Nrise, Seoul, KR Jan– Feb 2021
Marketing & Data Analyst Intern, Project Manager
- Optimized push message notifications by conducting user segmentation and customizing tailored messages
- Identified effective buzzwords on notifications by analyzing user click-rate using SQL and Python

Diveroid, Seoul, KR Oct 2020 – Jan 2021
Data Analyst Intern
- Developed a data-driven growth marketing strategy to optimize targeted advertising across various social media platforms
- Analyzed ad click-through rates to identify patterns of users and evaluated the marketing strategy's effectiveness

Republic of Korea Army (ROKA), Yang-Pyeong, KR 2018 – 2020
Sergeant, Satellite Operation Specialist, Missile Strategic Command
- Established mobile satellite communication systems connecting front-line missile battalions with base stations

TEACHING EXPERIENCES

Seoul National University: Growth Hackers, Seoul, KR 2020 –2021
Fellowship Workshop Head
- Conducted an educational program for over 20 selected underclassmen covering fundamental Python concepts and practical data analysis techniques

HONORS

- The 3rd place from thesis competition, Korea Hydropower Industry Association (KHA) Nov 2021
- SNU in Silicon Valley Entrepreneurship Fellowship, Stanford, CA Jun – Jul 2018

LANGUAGES / ENGINEERING SKILLS

- **Languages** : English (Proficient), Korean (Native), Chinese (Limited)
- **Programming Languages**: **C, C++, Python, Verilog, VHDL for embedded system applications**, Java, HTML/CSS/Javascript
- **Used Tools**: Matlab, LTSPICE, HSPICE, PLECS, Simulink, Consol Multiphysics, Altium, KiCad