KYOUNGMO KOO

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Ann Arbor, Michigan - 48105, United States of America

EDUCATION

University of Michigan

Master of Science in Electrical & Computer Engineering • Cumulative GPA : 4.00 / 4.00 Aug 2023 - May 2025 (Expected) Ann Arbor, MI

• Relevant Coursework : Lasers Lab(Winter 2025), Robotic Kinematic Dynamics, Linear System Theory

Seoul National University

Bachelor of Science in Electrical & Computer Engineering

- Cumulative GPA : 3.86 / 4.30, Major GPA : 3.92 / 4.30
- Relevant Coursework : Bioelectrical and Computer Engineering, Biology, Biology Lab, Introduction to Chemical and Biological Engineering, Physics, Signals and Systems, Introduction to Communications, Design Project for Electrical Devices & Systems, Digital Logic Design, Digital Integrated Circuits
- 2 years military leave of absence

RESEARCH INTERESTS

Optics (Optical Coherence Tomography, Ultrasound), Medical Robotics, Embedded Systems, Control

Research Experiences

- Image-Guided Medical Robotics Lab, Optical Imaging Lab[,)
 Robot Integrated Ultrasound System (PI: Prof. Xueding Wang, Prof. Mark Draelos), Research Assistant
 Developed a medical robotic system utilizing ultrasound and photoacoustic imaging techniques to scan the proximal interphalangeal (PIP) joint of a patient's finger for arthritis detection (Poster)
- Developed firmware for **real-time frame acquisition** and **calibration** between an ultrasound probe and robotic arm, utilizing **Python and C++** for solution implementation
- Designed **MATLAB and Python** interfaces for **medical image analysis**, integrating **robotic kinematic dynamics** theories, 3D computer vision libraries, and waypoint generation for arc scans

Digital Galvanometer Control for high-performance OCT (PI: Prof. Mark Draelos), Lab Intern

 Developed a digital interface for Galvanometer controller to enhance the quality of Optical Coherence Tomography (OCT) scan on an STM32L476RG board using C and STM32CubeIDE (Abstract)

- 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**
- Verified **resolution parity** with conventional analog interfaces using the **USAF 1951** target, and achieved a **higher Signal-to-Noise Ratio (SNR)** compared to conventional analog solutions

Applied Superconductivity Lab[

Superconductor Applied Motor & Generator (PI: Prof. Seungyong Hahn), Research Assistant

- Designed internal circuitry and mechanical structure 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 and validated use cases for a 10kW-scale wave energy converter design incorporating NI HTS, ensuring mechanical, thermal, and electromagnetic stability through COMSOL Multiphysics

PUBLICATIONS & PRESENTATIONS

- [C.1] Kyoungmo Koo, Lucia Lee, Morgan McCloud, and Mark Draelos. "Reducing Cost but not Quality with Digital Scanner Interfaces for Optical Coherence Tomography". In SPIE Photonics West 2025 : Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXIX, Accepted as Oral Presentation
- [J.1] Kyoungmo Koo*, Chaemin Im*, Geonyoung Kim, Jaemin Kim, Seungyong Hahn, and Sangjin Lee. "Design, Construction, and Operation of Liquid Nitrogen Cooled MHD Miniature Ship with No - Insulation High Temperature Superconductor Magnet". In *IEEE Transactions on Transportation*, Published in May, 2024
- [M.1] Kyoungmo Koo, Wonseok Jang, Jeonghwan Park, Jaemyung Cha, and Seungyong Hahn. "Conceptual Design and Analysis of No-Insulation High-Temperature Superconductor Tubular Wave Energy Converter". In ArXiv, Submitted in 2023

Mar 2017 - Aug 2023 Seoul, KR

Ann Arbor, MI

Jun 2021 - Aug 2023

Seoul, KR

C=CONFERENCE, J=JOURNAL, M=MANUSCRIPT

WORK EXPERIENCES

BorgWarner Inc.[]

- 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 functional blocks and enabled digital signal processing using Verilog / VHDL in Vivado environment.
- Designed a circuit prototype and PCB board to **optimize signal performance** for users.

Nrise Inc.[]

- 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[)

Data Analyst Intern

- Developed a data-driven 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

LEADERSHIP EXPERIENCE

 Korean Student Association - Graduate (KSAG)[] President (May 2024 - Present), Board Member (Aug 2023 - May 2024) Ann Arbor, MI Led an official student-run group under U of Michigan of 10 board members to organize networking events Assisted 150+ incoming students in adapting to a new environment and fostering socialization among Korean graduate students, post-docs, and visiting scholars Organized career events connecting Korean tech companies with Korean graduate students at the U of Michigan Republic of Korea Army (ROKA), Missile Strategic Command Aug 2018 – Mar 2020 Sergeant, Satellite Operation Specialist, Communications Squad Leader Yang-Pyeong, KR Connected the satellite communication systems between front-line missile battalions and ROK Joint Chiefs of Staff Awarded the excellence of leadership for leading a squad to complete a battalion-wide combat training successfully

TEACHING EXPERIENCE

 Growth Hackers Sep 2020 – Jun 2021 Fellowship Workshop Head Seoul, KR Conducted an educational program in Seoul National University (SNU) for over 20 selected underclassmen covering fundamental Python concepts and practical data analysis techniques

EXTRA-CURRICULAR EXPERIENCE

• Michigan Autonomous Aerial Vehicles (MAAV)[�]	Aug 2023 - Oct 2023
Embedded System Team	Ann Arbor, MI
• Participated in design of autonomous aerial vehicle for the International Aerial Robotics Competition (IARC)	
• Acquired proficiency in microprocessor GPIOs and communication protocols (SPI, UART) utilized in drone	
• SNU: Silicon Valley Entrepreneurship Fellowship Team	Iune 2018 - Aug 2018

Fellow

Selected out of 100+ competitive SNU applicant pools to participate in a entrepreneurial fellowship program

• Presented a business model with deep-learning based automated advertisement design at Stanford University

HONORS

- KSSC Oral Presentation 2022 (The Korean Society of Superconductivity and Cryogenics)
- The 3rd place from thesis competition, Korea Hydropower Industry Association (KHA)

LANGUAGES / ENGINEERING SKILLS

- Languages: English(Proficient), Korean(Native), Chinese(Limited)
- Programming Languages: C, C++, Python, Verilog, VHDL for embedded system applications, Java, SQL, HTML/Css/Javascript
- Used Tools: MATLAB, LTSPICE, COMSOL Multiphysics, HSPICE, PLECS, Simulink, Altium, KiCad, SolidWorks
- Basic Tools: Microsoft Excel, Microsoft Powerpoint, Microsoft Word, LATEX
- Test Scores: iBT TOEFL 110, GRE 158 / 169 / 3.5

May 2024 - Aug 2024 Kokomo, IN

> *Jan 2021 - Feb 2021* Seoul, KR

Oct 2020 - Jan 2021

Seoul, KR

Aug 2023 - Present

Stanford, CA

Aug 2022

Nov 2021