KYOUNGMO KOO

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Kyoungmo Koo | Kyoungmo Koo
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EDUCATION

- **University of Michigan** *Aug 2023 - May 2025 (Expected)*
  Master of Science in Electrical & Computer Engineering Ann Arbor, MI
  - Cumulative GPA : 4.00 / 4.00
  - Relevant Coursework : **Robotic Kinetic Dynamics**, Linear System Theory, Nonlinear System & Control
- **Seoul National University** *Mar 2017 - Aug 2023*
  Bachelor of Schience in Electrical & Computer Engineering Seoul, KR
  - 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[🌐]** *Aug 2023 - Present*
  Robot Applied Ultrasound System (Prof. Mark Draelos, Prof. Xueding Wang) Ann Arbor, MI
  - Developed a **medical robotic system** leveraging **ultrasound and photoacoustic** techniques to scan hands for arthritis detection
  - 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**,incorporating **robotic kinetic dynamics** theories and 3D computer vision libraries

  Digital Galvanometer Control for high-performance OCT (Prof. Mark Draelos) Ann Arbor, MI
  - 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**
  - 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[🌐]** *Jun 2021 - Aug 2023*
  Superconductor Applied Motor & Generator (Prof. Seungyong Hahn) Seoul, KR
  - 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

C=CONFERENCE, J=JOURNAL, M=MANUSCRIPT

[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*, Accepted

[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*

Work Experiences

- **BorgWarner Inc.[🌐]** *May 2024 - Aug 2024*
  Embedded System Intern, e-Hardware Architecture Team Kokomo, IN
  - 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.[🌐]** *Jan 2021 - Feb 2021*
  Data Analyst Intern, Project Manager Seoul, KR
  - 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[🌐]** *Oct 2020 - Jan 2021*
  Data Analyst Intern Seoul, KR
  - Developed a data-driven marketing strategy to optimize targeted advertising across various social media platforms
  - Analyzedad click-through rates to identify patterns of users and evaluated the marketing strategy's effectiveness

Leadership Experience

- **Korean Student Association - Graduate (KSAG)[🌐]** *Aug 2023 – Present*
  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** utilized in drone
- **SNU: Silicon Valley Entrepreneurship Fellowship Team** *June 2018 - Aug 2018*
  Fellow Stanford, CA
  - 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)** *Aug 2022*
- **The 3rd place from thesis competition, Korea Hydropower Industry Association (KHA)** *Nov 2021*

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