Youngwoong Youn

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SUMMARY

- Interdisciplinary researcher with experience in systems for mobility, energy devices, and manufacturing.

- Skilled in physics-informed modeling, sensor data analysis, and decision-oriented system design.

- Seeking to extend system-level expertise toward brain–computer interface (BCI) applications.

EDUCATION

- **Hanyang University** — Seoul, South Korea

  Bachelor of Science in Mechanical Engineering — *Mar. 2020 – Feb. 2027(Expected)*

Thesis: Reconstruction of Electrochemical Nyquist Plots via a Reinforcement Learning Based Generative Model

CAREERS

- **Fraunhofer IPT** [Link] — Aachen, Germany

  Visiting Scientist (Full-time) — *Sep. 2025 - Present*

  Department: Modular Production Machines

  Group: Interlinked Production Machines

  - Developed automated signal analysis pipelines for extracting geometric features from manufacturing sensor data.
  - Applied frequency-domain methods to identify structural deviations and noise patterns in complex systems.
  - Designed GUI data acquisition workflows using Keyence sensor systems for high-precision sensing and real-time validation.

- **Clean Energy Solution Lab** [Link] — Seoul, South Korea

  Undergraduate Researcher — *Jun. 2023 - Jun. 2025*

  - Developed signal analysis and modeling pipelines for electrochemical systems using EIS, machine learning, and physics-informed methods.
  - Built data-driven models to restore incomplete sensor data and improve system state estimation in real-time applications.
  - Integrated experimental hardware, simulations, and control models for intelligent energy and sensing systems.

- **Research group of Automotive Control Engineering** [Link] — Seoul, South Korea

  Gearbox Designer, Powertrain Dept — *Jun. 2020 – Jul. 2021*

  - Designed and optimized a mechanical transmission system for an electric powertrain.
  - Integrated energy management and motor control subsystems for efficient system operation.
  - Applied simulation and structural analysis tools for performance and reliability evaluation.

SKILLS

- **Machine Learning** - PyTorch, Scikit-learn; Physics-informed ML, Model Evaluation & Tuning

- **Signal Processing & Time-Series** - NumPy, SciPy; FFT, Feature Engineering

- **Simulation & Digital Twin** - ANSYS, Simulink; Model Validation & Parameter Studies

- **Programming & OS** - Python, MATLAB, C/C++; Linux, Windows; Git

- **Mechanical** - CATIA

- **Embedded & Electronics** - STM32, Arduino; KiCad

- **Manufacturing** - CNC(Lathe/Milling), CFRP Processes, Electrode/Solid Electrolyte Fabrication

Awards

- **Capstone Project Awards [Poster]** 2025
  - ○ organized by School of Mechanical Engineering, Hanyang University
- **Eco-friendly Mobility System Control Design Festival** 2025
  - ○ organized by Hanyang University Engineering Education Innovation CenteR
  - ○ Grand Prize
- **KSAE Formula Student EV part** 2021
  - ○ First Place for Altair Optimum Design Award
  - ○ Silver Place For Technology Idea Award

Conference

- **The Korean Society Of Automotive Engineers [Poster]** 2024
  - ○ Youn, Y., & Bae, J. (2024). Comparative Analysis of Grace Capacity in NMC and LFP Battery Cells for Electric Vehicle Applications. KSAE 2024 Annual Autumn Conference & Exhibition, 1917–1917.