

EDUCATION

Seoul National University Seoul, Republic of Korea
Ph.D. Candidate, Electrical and Computer Engineering 2023 – present

- Lab: Power Conversion and Systems Lab (PCSL)
- Advisor: Prof. Shenghui Cui
- Research: Modular multilevel converters (MMC), medium-voltage variable frequency drives, power-hardware-in-the-loop (PHIL) testing, real-time simulation.

Seoul National University Seoul, Republic of Korea
M.S., Electrical and Computer Engineering; GPA: 4.03/4.3 2021 – 2023

- Lab: Electrical Engineering & Power Electronics Lab (EEPEL)
- Advisor: Prof. Seung-Ki Sul
- Thesis: Real Time Torque Control of PMSM under Flux Weakening Operation Based on Nonlinear Optimization.

Seoul National University Seoul, Republic of Korea
B.S., Electrical and Computer Engineering; GPA: 3.35/4.3 2015 – 2021

- Thesis: Battery Electric Vehicle Motor Control System Design and Implementation.

RESEARCH EXPERIENCE

Power Conversion & Systems Lab, Seoul National University Seoul, Republic of Korea
Ph.D. Candidate; Advisor: Prof. Shenghui Cui 2023 – present

- MMC-Based MV Variable Frequency Drive: Led development of control algorithms and control systems for a 5 MW Modular Multilevel Converter VFD for shipboard applications.
- PHIL Testing for Megawatt-Scale MMC: Developed a partial power-hardware-in-the-loop framework for in-situ dynamic and steady-state validation of individual submodules in a megawatt-scale MMC.

Electric Energy Processing & Control Lab, Seoul National University Seoul, Republic of Korea
M.S. Researcher; Advisor: Prof. Seung-Ki Sul, IEEE Fellow 2021 – 2023

- IPMSM Optimal Control: Developed online MTPA tracking and flux-weakening torque control algorithms for interior permanent magnet synchronous motors using sequential quadratic programming (SQP) and min-max optimization, achieving robust performance under parameter uncertainties without lookup tables.

Signal Processing Systems Lab, Seoul National University Seoul, Republic of Korea
Research Assistant; Advisor: Prof. Wonyong Sung, IEEE Fellow 2020 – 2021

- Snoring Diagnosis Application: Developed custom ESP32 board and custom firmware for snoring diagnosis.

Republic of Korea Army Seoul, Republic of Korea
Research Engineer 2018 – 2020

- Parallel Computing for Signal Processing: Developed parallel computing algorithms for massive signal processing.

TEACHING EXPERIENCE

Seoul National University Seoul, Republic of Korea
Teaching Assistant, Electric Machines and Control; Instructor: Prof. Seung-Ki Sul Fall 2021, Fall 2023

- Responsibilities: Conducted lab sessions and tutorials; assisted students with coursework and problem sets.

Lecturer, SNU Power Electronics Center Summer School Summer 2022

- Responsibilities: Delivered lectures on digital signal processor programming and embedded firmware development for power electronics applications.

PUBLICATIONS

Journal Articles

J. Park, D.-J. Kim, S.-Y. Lee, J.-J. Jung, S.-K. Sul and S. Cui, "Partial Power-Hardware-in-the-Loop Test for In-Situ Dynamic and Steady-State Validation of a Single Submodule in a Megawatt-Scale MMC," in *IEEE Transactions on Power Electronics*, vol. 41, no. 5, pp. 8409-8427, May 2026.

J. Park et al., "Equivalent Circuit Extraction of MI-HTS Coil Including High-Frequency Region for Electromagnetic Transient Simulation With Voltage-Source Converter," in *IEEE Transactions on Applied Superconductivity*, vol. 35, no. 7, pp. 1-11, Oct. 2025.

D.-J. Kim, **J. Park**, Y. Hong and S. Cui, "Fault-Tolerant Independent Pole Control Scheme of Zigzag MMC for Bipolar MVDC Distribution Systems," in *IEEE Transactions on Power Electronics*, vol. 41, no. 6, pp. 10324-10342, June 2026.

J. Maeng, J. Ham, G. Park, **J. Park**, H. Wu, J.-J. Jung, S. Cui, "A Supercapacitor Size Minimization and Energy Management Strategy for E-STATCOM Connected to Weak Grid," *International Journal of Electrical Power & Energy Systems*, vol. 172, Art. no. 111174, Nov. 2025.

Y.-W. Kim, H. Kim, **J. Park**, S.-K. Sul, "On-line Minimum Loss Control Strategy of IPMSM in Torque-Controlled Application," *Journal of Power Electronics*, vol. 24, p. 756, Apr. 2024.

Conference Papers

J. Yun, **J. Park**, S. Moon, G. De Carne and S. Cui, "Resource-Efficient Real-Time Simulation of Multi-Active Bridge Converters Using Modular Programming," *2025 IEEE Kiel PowerTech*, Kiel, Germany, 2025, pp. 1-6,

J. Park, J. Lee, D. Kim, S. Lee, S. Moon, J. Yoo, S. Ko, S. Cui, "MMC-Based High-Power Motor Emulator for Testing of Electrical Propulsion System," *2025 IEEE Electric Ship Technologies Symposium (ESTS)*, Alexandria, VA, USA, 2025, pp. 162-169.

S. Moon, **J. Park**, D. Kim, and S. Cui, "Generator Operation Strategy for Naval Vessels with MVDC Distribution in Combat Situations," *2025 IEEE Electric Ship Technologies Symposium (ESTS)*, Alexandria, VA, USA, 2025, pp. 162-169.

S. Lee, **J. Park**, D. Kim and S. Cui, "Optimal Nearest-Level Modulation of MVDC-MMC with Decoupled Control for Lower Phase Current Total Harmonic Distortion," *2025 IEEE Energy Conversion Conference Congress and Exposition (ECCE)*, Philadelphia, PA, USA, 2025, pp. 1-5.

G. Park, **J. Park**, S. Cui, S.-K. Sul, "Nonlinear Optimization-Based Power-Voltage Control of Grid-Connected Converter in Weak Grid," *2024 IEEE Applied Power Electronics Conference and Exposition (APEC)*, Long Beach, CA, USA, 2024, pp. 228-233.

J. Park, H.-J. Cho, H. Kim, S.-K. Sul, "Online Torque Control of IPMSM for Flux Weakening Operation Using Sequential Quadratic Programming," *2023 IEEE Energy Conversion Congress and Exposition (ECCE)*, Nashville, TN, USA, 2023, pp. 4750-4755.

J. Park, H.-J. Cho, J. Yun, S.-K. Sul, "Online MTPA Tracking of IPMSM Based on Min-Max Optimization," *2023 11th International Conference on Power Electronics and ECCE Asia (ICPE 2023 - ECCE Asia)*, Jeju Island, Korea, Republic of, 2023, pp. 199-204.

AWARDS

Excellence Prize in Creative Design Fair 2016, Seoul National University, 2016