Hyeongmeen Baik

Department of Electrical & Computer Engineering, University of Wisconsin - Madison, WEMPEC
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EDUCATION

University of Wisconsin - Madison, Madison, Wisconsin — Aug 2023 — Expected 2028
Ph.D., Electrical & Computer Engineering
Wisconsin Electric Machines and Power Electronics Consortium (WEMPEC)
Advisor: *Prof. Jinia Roy*

Yonsei University, Seoul, Korea — Mar 2017 — Feb 2023
B.S., Electrical & Electronic Engineering — Cumulative GPA: 4.09 / 4.3 (Class rank: 8 /333)
Thesis: Short-term Photovoltaic Power Forecasting Model, based on Artificail Neural Network and Meterological Factors
Advisor: *Prof. Jung-wook Park*

HONORS AND AWARDS

Scholarship for Academic Excellence (Full-tuition), Yonsei University — Fall-2022, Spring-2021
Scholarship for Academic Excellence (Half-tuition), Yonsei University — Spring-2022, Fall-2021
Highest Honors (Top 1% of department), Yonsei University — Spring-2022, Fall-2020
High Honors (Top 3% of department), Yonsei University — Spring-2021, Fall-2019
Honors (Top 10% of department), Yonsei University — Fall-2021

RESEARCH EXPERIENCE

WEMPEC, University of Wisconsin - Madison — Madison, WI
Research Assistant (Advisor: *Prof. Jinia Roy*) — Aug 2023 - Ongoing

- Review of pulsed power applications and power stages thereof.
- Analytical optimization of magnetic pulse compression circuits and magnetic switches.
- Systematical verification of series-connected power stages for pulsed power applications, including auxiliary compensator (*i.e.,* power pulsation buffer, fast voltage compensator).
- Development and implementation of research prototypes, including full-bridge LLC series resonant converter and phase-shifting full-bridge converter, suitable for pulsed power application and high-speed series-connected power modulator.

Design & Control Laboratory, KoreaTech — Cheonan, Korea
Research Assistant (Advisor: *Prof. Ye gu Kang*) — Apr 2022 - Jun 2023

- Led project on simultaneous measurement system of rotary and x-y displacement using dq0 transformation based on linear Hall-effect sensors and applied for patent.
- Developed prototytpes for estimation of x-y and rotary position, using FEMM for FEA of optimized rotor geometry, EagleCAD for PCB design, Fusion 360 for rotor and stator design, and CCS to set up MCU for signal processing.
- Researched linear Hall sensor-based rotation angle measurement system economically replacing magnetic resolver while maintaining peripheral circuits of existing magnetic resolver, and designed optimal rotor geometry of interior permanent magnet motor using differential evolution algorithm.
- Evaluated performance of machine design capable of operating both as generator and as motor on ship (Hyosung).
- Participated in the undergraduate project, reverse engineering of switching mode power supply, as teaching assistant and covered basic power electronics, LTspice simulation, and 3D CAD design.

Communication Signal Processing Laboratory, Yonsei University — Seoul, Korea
Research Intern (Advisor: *Prof. Chungyong Lee*) — Jan 2022 – Mar 2022

- Evaluated performances of communication system replaced by single Deep Learning network.
- Reviewed modulation schemes for communication and bit error rate performance of Orthogonal
- Frequency Division Multiplexing on multi or single path.

PATENTS

Hyeongmeen Baik, Ye gu Kang, "Hall Sensor Based Rotor Position Estimation System and Method", Korean Patent Application No. 10-2022-0060038 (2022)

SKILLS

- **Software:** MATLAB & Simulink, Fusion360, JMAG, FEMM.
- **Circuit Design:** Simscape, PSpice, LTspice, EagleCAD, Altium, EMTP-ATP, PSIM, PLECS.
- **Programming:** Verilog, C, C++, Python, Code Composer Studio, Microchip studio.