

Hien Vu

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Education

- Purdue University**, West Lafayette, Indiana, USA (expected) 2026
Ph.D. in Electrical and Computer Engineering
- Major area: Computer Engineering; Minor area: Computer Science
 - Advisor: Dr. Younghyun Kim
- University of Wisconsin–Madison**, Madison, Wisconsin, USA 2023
M.Sc. in Electrical and Computer Engineering
- GPA: 3.82/4.00
- Soongsil University**, Seoul, South Korea 2020
M.S. in Computer Science
- GPA: 3.86/4.00
- Hanoi University of Science and Technology**, Hanoi, Vietnam 2018
B.Eng. in Electronics and Computer Engineering
B.Sc. in Electronics and Telecommunications Engineering

Professional Experience

- Research Assistant**, Purdue University, West Lafayette, IN, USA 2024–Present
- Working on radar-based wireless sensing mechanisms for dairy cattle health monitoring.
 - Developed a multimodal sensing system including high-precision indoor localization, physiological monitoring, and ML-based computer vision for identification and tracking of dairy cattle.
- Research Assistant**, University of Wisconsin–Madison, Madison, WI, USA 2021–2024
- Developed a lightweight, non-invasive wearable ear tag to monitor dairy cattle body temperature in real-time for heat stress detection.
 - Engineered a wireless power system that autonomously charges the tag during 10-minute milking sessions, enabling up to five days of continuous operation on a single charge.
 - Fabricated and deployed seven prototype tags in a three-week field trial at UW-Madison's operational dairy barn, assessing real-world performance in cattle management.
 - Collaborated with cross-disciplinary teams to ensure seamless integration of hardware, firmware, and data collection systems for accurate and continuous monitoring.
- Research Assistant**, Soongsil University, Seoul, South Korea 2019–2021
- Designed a flexible, high-energy supercapacitor-based power device for military applications, capable of delivering 840 W in multiple 5-second discharge cycles. Developed a bi-directional buck-boost control algorithm to ensure continuous system operation without interruptions.
 - Developed pre-heating techniques for lithium battery in cold environments using a novel energy exchange process to balance temperature and state of charge without requiring cell characterization.
 - Developed a high-speed, custom storage device using an FPGA controller and 512GB of SLC-NAND flash (with more than 1000 components), optimizing signal integrity and minimizing delay.
 - Implemented an Extended Kalman Filter on a RISC-V MCU for pose tracking in augmented reality, processing data from a 9-DOF IMU integrated with Parallel Tracking and Mapping (PTAM).
- Research Visitor**, Seoul National University of Science and Technology, South Korea 2018
- Integrated CAN bus control for Li-ion batteries in electric vehicles.
- System Engineer**, Interland Inc., Hanoi, Vietnam 2017
- Investigated sensing solutions for measuring dissolved oxygen in water.
- Research Assistant**, Hanoi University of Science and Technology, Hanoi, Vietnam 2015–2018
- Developed a gyroscope-based balancing system for two-wheel personal vehicles.
 - Designed air pollution monitoring devices and deployed on a large scale.

Skills

- **Machine Learning & AI:** ML-based computer vision, sensor data fusion, and real-time ML deployment.
- **Programming:** Advanced proficiency in Python (data analysis, ML, automation), C/C++ (embedded systems, real-time applications), MATLAB, Assembly (MIPS programming), and Verilog (ModelSim).
- **Embedded Systems:** microprocessor design, real-time systems, and sensor integration (RISC-V MCU).
- **Hardware Design:** High-speed/high-power/low-power systems design, wireless sensing systems.
- **Data Analysis & Simulation:** Physical system modeling, multimodal signal processing, MATLAB simulations.
- **Cross-Disciplinary Collaboration:** Worked with diverse teams to develop and deploy complex systems.

Publications

Wireless Sensing in Precision Agriculture

- [Hien Vu](#), Omkar Prabhune, Unmesh Raskar, Dimuth Panditharatne, Hanwook Chung, Christopher Y. Choi, and Younghyun Kim. **MmCows: A Multimodal Dataset for Dairy Cattle Monitoring**. NeurIPS (the Conference on Neural Information Processing Systems), 2024. Spotlight paper, top 5% ratings, acceptance rate 25.3%.
- Hanwook Chung, [Hien Vu](#), Younghyun Kim, and Christopher Y. Choi. **Subcutaneous temperature monitoring through ear tag for heat stress detection in dairy cows**. Biosystems Engineering, 2023.
- [Hien Vu](#), Hanwook Chung, Christopher Y. Choi, and Younghyun Kim. **eTag: An Energy-Neutral Ear Tag for Real-Time Body Temperature Monitoring of Dairy Cattle**. ACM MobiCom (International Conference on Mobile Computing and Networking), 2023. Acceptance rate 24%.

Electrical Energy Storage Management

- [Hien Vu](#) and Donghwa Shin. **Simultaneous Internal Heating for Balanced Temperature and State-Of-Charge Distribution in Lithium-ion Battery Packs**. Journal of Energy Storage, 2023.
- Nhat-An Nguyen, [Hien Vu](#), Massoud Pedram, and Donghwa Shin. **An Attachable Battery– Supercapacitor Hybrid for Large Pulsed Load**. IEEE Design & Test, 2022.
- [Hien Vu](#) and Donghwa Shin. **Scheduled Pre-heating of Li-ion Battery Packs for Balanced Temperature and State-of-charge Distribution**. MDPI Energies, 2020.

Control Systems Design

- [Hien Vu](#), Nhan Tran, Loan Pham-Nguyen, and Huy-Dung Han. **LQG Regulator for Control Moment Gyroscope based Balancing System**. IEEE ICCE (International Conference on Communications and Electronics), 2018.

Fellowships and Awards

- **Young Fellowship** and **Travel Award**, ACM/IEEE Design Automation Conference 2023
- **NSF Travel Award**, International Conference on Mobile Computing and Networking 2023
- **Young Fellowship**, ACM/IEEE Design Automation Conference 2021