Hien Vu

hienvu@purdue.edu | hienvuvg.github.io | LinkedIn

Research Interests ____

- ML-driven system design and signal processing for remote sensing
- Low-power wireless sensing
- Thermal management for Li-ion batteries

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

Publications ____

Wireless Sensing in Precision Agriculture

- <u>Hien Vu</u>, 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, <u>Hien Vu</u>, Younghyun Kim, and Christopher Y. Choi. **Subcutaneous temperature monitoring through ear tag for heat stress detection in dairy cows**. Biosystems Engineering, 2023.
- <u>Hien Vu</u>, 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

- <u>Hien Vu</u> 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, <u>Hien Vu</u>, Massoud Pedram, and Donghwa Shin. An Attachable Battery- Supercapacitor Hybrid for Large Pulsed Load. IEEE Design & Test, 2022.
- <u>Hien Vu</u> 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

• <u>Hien Vu</u>, 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.

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Fellowships and Awards	
2023 2023	Young Fellowship and Travel Award, ACM/IEEE Design Automation Conference NSF Travel Award, International Conference on Mobile Computing and Networking
2023	Young Fellowship, ACM/IEEE Design Automation Conference
2021	Toung Fellowship, ACM/IEEE Design Automation Contelence
Professional	Experience
2024-Present	 Research Assistant, Purdue University, West Lafayette, IN, USA Working on low-power wireless sensing mechanisms in precision agriculture Developing multimodal sensing techniques for health monitoring of dairy cattle
2021–2024	 Research Assistant, University of Wisconsin–Madison, Madison, WI, USA Developed an energy - neutral ear tag for real - time heat stress detection in dairy cattle Optimized RFID backscattering for low - power wireless temperature measurement Integrated inductive resonant coupling for effective wireless power transfer
2019–2021	 Research Assistant, Soongsil University, Seoul, South Korea Developed control strategies for internal heating of Li-ion batteries in cold conditions Designed a high-speed high-performance FPGA-based NAND flash storage system Engineered a flexible portable non-interrupt conformal wearable battery for military
2018	Research Visitor , Seoul National University of Science and Technology, South Korea • Integrated CAN bus control for Li-ion batteries in electric vehicles
2017	System Engineer, Interland Inc., Hanoi, VietnamInvestigated sensing solutions for measuring dissolved oxygen in water
2016	Design Intern, Viettin, Hanoi, VietnamDeveloped IBM - based cloud solutions for automated indoor agriculture
2015–2018	 Research Assistant, Hanoi University of Science and Technology, Hanoi, Vietnam Developed a gyroscope-based balancing system for two-wheel personal vehicles Designed air pollution monitoring devices and deployed on a large scale
Teaching & I	Mentoring Experience
Fall 2023	 ECE 399 Independent Study, Research Mentor, UW-Madison, WI Project: Analyzing gas compounds for health monitoring of dairy heifers Helped an undergrad student develop a wireless sensor suite for measuring gases
Spring 2023	 ECE 399 Independent Study, Research Mentor, UW-Madison, WI Project: Characterizing high-precision pressure sensor for monitoring dairy cattle Mentored an undergrad student in analyzing air pressure to detect standing behaviors
Fall 2022	 Undergraduate Research Scholars Program, Research Mentor, UW-Madison, WI Project: Monitoring dairy cattle's comfort using integrated ear tags Helped an undergrad student to develop a low-power ear tag to measure ear flicks
Spring 2022	ECE 315 Introduction to Microprocessor Lab, Teaching Assistant, UW-Madison, WI
Fall 2021	ECE 315 Introduction to Microprocessor Lab, Teaching Assistant, UW-Madison, WI
Fall 2021	ECE 210 Introduction in Electrical Engineering, Teaching Assistant, UW - Madison, WI
Spring 2020	Circuits Laboratory II, Teaching Assistant, Soongsil University, Seoul, South Korea
Fall 2019	Circuits Laboratory I, Teaching Assistant, Soongsil University, Seoul, South Korea
Fall 2018	Power Flectronics Teaching Assistant HUST Hanoi Vietnam

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Presentations _____ **Purdue OIGP Spring Reception**, Interdisciplinary Graduate Programs • Title: Multimodal Sensing and Learning for Precision Livestock Farming August 2024 ACM/IEEE ISLPED (International Symposium on Low Power Electronics and Design) • Title: eTag: An Energy-Neutral Ear Tag for Real-Time Body Temperature Monitoring of Dairy Cattle NSF CPS PI Meeting (Cyber-Physical Systems Principal Investigators' Meeting) March 2024 • Title: Mitigating Heat Stress in Dairy Cattle using a Physiological Sensing-Behavior Analysis - Microclimate Control Loop **UW-Madison Sustainability Symposium** October 2023 • Title: Sustainable Dairy Farming using Wearable Technology for Heat Stress Detection **ACM MobiCom** (International Conference on Mobile Computing and Networking) October 2023 • Title: eTag: An Energy-Neutral Ear Tag for Real-Time Body Temperature Monitoring of Dairy Cattle July 2023 **ACM/IEEE DAC** (Design Automation Conference), Young Fellow Program • Title: WisTaq: An Energy - Neutral Wearable Sensor for Real - Time Animal Monitoring December 2021 ACM/IEEE DAC (Design Automation Conference), Young Fellow Program • Title: An Optimal Control Scheme for Hybrid Power System with Synchronous Buck Converter Media Coverage _____ Nov 9, 2023 Smart system keeps cows cool. Covered by Agri-View (link). Oct 18, 2023 Mooooo's in distress? In the barn of the future, smart system will keep hot cows cool. Covered by UW-Madison News (link).

Skills _____

- Machine Learning & Al: ML-based computer vision, sensor data fusion, and real-time ML deployment.
- **Programming:** Python, C/C++, MATLAB, Assembly, and Verilog.
- 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.

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