

# Hien Vu

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## RESEARCH INTERESTS

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

## EDUCATION

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**Purdue University**, West Lafayette, Indiana, USA (expected) 2026  
Ph.D. in Electrical and Computer Engineering, GPA: 3.65/4.00

- 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.Sc. in Electronics and Telecommunications Engineering, GPA: 3.51/4.00

## PUBLICATIONS

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### Wireless Sensing in Precision Agriculture

- Unmesh Raskar, Omkar Prabhune, **Hien Vu**, and Younghyun Kim. MooBot: RAG-based Video Querying System for Dairy Cattle Behavior and Health Insights. **CVPR Workshop**, 2025.
- **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

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

## PROFESSIONAL EXPERIENCE

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- 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.
- 2018–2019 **System Engineer**, Interland Inc., Hanoi, Vietnam
- Investigated sensing solutions for measuring dissolved oxygen in water.
  - Integrated IBM-based cloud service for large-scale automated shrimp farming.
- 2015–2018 **Research Assistant**, Hanoi University of Science and Technology, Hanoi, Vietnam
- Developed a gyroscope-based balancing system for two-wheeled personal vehicles.
  - Designed air pollution monitoring devices and deployed on a large scale.

## TEACHING and MENTORING EXPERIENCE

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- 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 Electronics**, Teaching Assistant, HUST, Hanoi, Vietnam

## PROFESSIONAL SERVICES

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June 2025 Reviewer for 2025 NeurIPS (The Conference on Neural Information Processing System)

## PRESENTATIONS

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- October 2025 **Purdue Institute of Chips and AI: Workshop on Chips & AI**  
• Title: Edge AI for Wearable and Wireless Sensing
- May 2025 **Purdue OIGP Spring Reception**, Interdisciplinary Graduate Programs  
• Title: Multimodal Sensing and Learning for Precision Livestock Farming
- January 2025 **Purdue AI Fusion**  
• Title: Multimodal Sensing and Learning for Precision Livestock Farming
- December 2024 **NeurIPS** (The Conference on Neural Information Processing System)  
• Title: MmCows: A Multimodal Dataset for Dairy Cattle Monitoring
- October 2024 **Purdue ECE Grad Student Symposium**  
• Title: MmCows: Multimodal Sensing and Deep Learning Framework for Dairy Cattle Monitoring
- 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
- March 2024 **NSF CPS PI Meeting** (Cyber-Physical Systems Principal Investigators' Meeting)  
• Title: Mitigating Heat Stress in Dairy Cattle using a Physiological Sensing-Behavior Analysis-Microclimate Control Loop
- October 2023 **UW-Madison Sustainability Symposium**  
• Title: Sustainable Dairy Farming using Wearable Technology for Heat Stress Detection
- October 2023 **ACM MobiCom** (International Conference on Mobile Computing and Networking)  
• 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: WisTag: 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

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- Nov 9, 2023 Smart system keeps cows cool. Covered by Agri-View ([link](#)).
- Oct 18, 2023 Moosooo's in distress? In the barn of the future, smart system will keep hot cows cool. Covered by UW-Madison News ([link](#)).

## KEY SKILLS

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- **Machine Learning & AI:** 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.