

# Hien Vu

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Embedded research engineer and sensing system architect seeking R&D roles in ML-enabled sensing and wireless systems.

## EDUCATION

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<b>Purdue University</b> , West Lafayette, Indiana	(expected) August 2026
PhD in Electrical and Computer Engineering (candidate)	GPA: 3.65/4.0
<b>University of Wisconsin-Madison</b> , Madison, Wisconsin	May 2023
MSc in Electrical and Computer Engineering	GPA: 3.82/4.0
<b>Hanoi University of Science and Technology</b> , Hanoi, Vietnam	May 2018
BSc in Electronics and Telecommunications Engineering	GPA: 3.51/4.0

## KEY SKILLS

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- **Hardware & Embedded:** Verilog, MIPS, RISC-V, PCB Design (Altium), mmWave, UART/I2C/SPI, RF and high-speed design.
- **Software & Algorithms:** Python, C/C++, MATLAB, assembly, bash; sensor fusion, computer vision, signal processing.

## PROFESSIONAL EXPERIENCE

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<b>NEIS Lab, Purdue University – Research Assistant</b> – West Lafayette, IN	Aug 2024 – Present
• Architected a machine learning system that uses mmWave radar IWR1843 to track respiration of moving subjects, achieved pose tracking error < 5 cm for 97% of the time and respiration error < 3 bpm 91% of the time in breathing range 10-45 bpm.	
• Developed two sensing systems including a high-precision Ultra-Wideband localization system, and optimization-based multi-view visual 3D localization and tracking of dairy cattle, both achieved centimeter accuracy.	
• Engineered an end-to-end multimodal ML fusion pipeline (UWB+IMU+RGB) for subject tracking and behavior monitoring.	
• Designed a distributed data ingestion pipeline for 9 sensor modalities, automating temporal synchronization (drift < 10ms) and annotation validation for 300k seconds of data, published at NeurIPS 2024 as MmCows dataset.	
<b>WISEST Lab, UW-Madison – Research Assistant</b> – Madison, WI	Aug 2021 – Jul 2024
• Developed eTag, an energy-neutral sensing system using backscatter communication, published at ACM MobiCom 2023.	
• Designed a novel shared-coil architecture for simultaneous RFID communication and wireless charging in wearable devices, solving mutual coupling problem while realizing a compact design that is 30% the size of standard dual-coil hardware designs.	
• Developed energy-efficient firmware for RFID scanning using STM32-based LoRa SoC that reduced the energy cost by 15x, and engineered a closed-loop wireless power transfer protocol for autonomous charging of wearable devices.	
<b>EC Lab, Soongsil University – Research Assistant</b> – Seoul, South Korea	Mar 2019 – Jul 2021
• Designed a flexible, portable supercapacitor-based power device using cascade multiphase DC-DC buck power converter that delivers 840W in 5-second pulses, optimizing energy density and form factor for rapid and critical military applications.	
• Developed a novel bidirectional buck-boost control policy that enables uninterrupted power delivery and continuous system operation under dynamic load conditions, surpassing system design specs in functionality.	
• Designed a high-speed FPGA-based flash storage system with 512GB SLC-NAND using Altium Designer, ensuring signal integrity and minimizing propagation delay across 1,000+ components.	
• Implemented Extended Kalman Filter on a RISC-V MCU to process 9-DOF IMU data for precise pose tracking in AR/VR apps.	
<b>Interland Inc. – System Engineer</b> – Hanoi, Vietnam	Jun 2018 – Feb 2019
• Investigated sensing solutions for measuring dissolved oxygen in water, and integrated with IBM-based cloud service for large-scale automated shrimp farming.	

## PROJECT LEADERSHIP

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- Led development efforts for the flexible Conformal Wearable Battery (CWB) device, including system testing, integration, and technology transfer from research lab to DoD contractor for real-world production.
- Recruited and trained a team of 20+ people to curate the MmCows large-scale multimodal dataset (20k annotated of 4.8M RGB images) while ensuring data synchronization and annotation accuracy using automated visual localization.
- Collaborated and led a cross-discipline team to design and deploy eTag as a multi-node IoT network on multiple production cattle, analyzing over 2,000 hours of field data to validate system reliability in complex operational settings.