

2 Ph.D. Opportunities (Spring/Fall 2027) in Applied Electromagnetics and Hardware Cybersecurity for Intelligent and Secure Wireless Cyber-Physical Systems

Position description – Dr. Duc Pham’s research group at University of Cincinnati (UC) is seeking for 1–2 self-motivated Ph.D. students, who are passionate about applied electromagnetics, wireless technologies (i.e., antenna, RF sensors, and other EM devices), and hardware cybersecurity for wireless cyber-physical systems. Successful candidates will receive stipend support and tuition waiver through graduate assistantships (TA/RA).

Potential research topics include, but are not limited to:

- Secure and intelligent RF/EM hardware for the next generation of wireless communications
- EM-encrypted automotive radar for countering cyberattacks
- Hardware cybersecurity (hardware trojan detections, countering side-channel attacks, etc.)
- Physical unclonable functions (PUFs), electromagnetic/RF fingerprinting, and hardware authentication technologies
- Millimeter-wave/microwave antennas, metasurfaces, and RF sensors
- AI-assisted RF sensing/identification, and hardware security
- Additive manufacturing-aided RF/microwave devices

Wild cards are encouraged to reach out. Students with strong backgrounds in related areas and an interest in exploring new interdisciplinary research directions are welcome to apply.

Minimum qualifications

- Bachelor's or Master's degree in electrical and electronics engineering, physics, or related fields.
- GPA minimum of 3.0 (on a 4.0 scale) or equivalent in the highest degree earned to apply.
- English proficiency test: TOEFL (minimum 92) or IELTS (minimum 6.5).
- Ability to meet other admission requirements of the University of Cincinnati ECE graduate program.

Preferred qualifications – Experience in one or more of the following areas is desirable but not required.

- Electromagnetics, antennas, RF/microwave engineering, or wireless systems
- RF/microwave circuits and electronics
- Hardware security, physical-layer security, or PUFs
- Electromagnetic/circuit simulation tools such as HFSS, CST, ADS
- MATLAB, Python, embedded systems, SDR, or digital signal processing
- PCB design, prototyping, RF measurements, or experimental hardware development
- Advanced manufacturing electronics (i.e. inkjet printing, screen printing, 3D/4D printing, etc)

Strong motivation for research, creativity, independence, and willingness to learn across disciplinary boundaries are particularly valued.

About the advisor – Dr. Duc Pham is an incoming tenure-track Assistant Professor in the Department of Electrical and Computer Engineering at the University of Cincinnati (UC). His research focused on developing secure and intelligent electromagnetic hardware for next-generation wireless cyber-physical systems. He has authored journal and conference publications in venues including IEEE Internet of Things

Journal, IEEE Transactions on Antennas and Propagation, IEEE Transactions on Vehicular Technology, and IEEE Transactions on Instrumentation and Measurement. He was a finalist for the Young Scientist Award at 2025 ICEAA/IEEE-APWC and currently serves as a Chair Officer of the IEEE Chicago APS/MTT-S Joint Chapter (AP03/MTT17). More details can be found [here](#).

About EMAGINE laboratory – At EMAGINE, we advance the frontiers of applied electromagnetics to enable the next generation of intelligent, secure, and trustworthy wireless systems. Our research bridges fundamental electromagnetic theory with cutting-edge engineering to address emerging challenges in antennas, RF systems, wireless communications, sensing, and hardware cybersecurity. Our research is centered around two complementary themes. The first focuses on developing high-performance electromagnetic and RF systems that improve efficiency, reconfigurability, adaptability, and intelligence for future wireless and cyber-physical applications. The second investigates hardware-based cybersecurity for wireless infrastructures, where intrinsic electromagnetic and RF characteristics are leveraged to establish secure device authentication and resilient physical-layer protection against increasingly sophisticated cyber threats.

About the university – University of Cincinnati is a major R1 research institution and the birthplace of cooperative education (co-op), having founded the world's first co-op program in 1906. It is currently ranked #207 by U.S. News and #246 globally by CWUR, and #4 nationwide for its co-op education program, which integrates academic training with paid industry experience at leading technology companies.

How to apply – Prospective students are encouraged to contact Prof. Pham at ducpham.mmw@gmail.com with:

- Most recent CV.
- Undergraduate and graduate transcripts, if applicable
- A brief statement describing research interests and relevant experience.