

# Minye Yang

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## Education Experiences

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**Ph.D. Candidate** Department of Electrical and Computer Engineering, University of Illinois at Chicago

2019-present Chicago, IL, USA. Advisor: Dr. Pai-Yen Chen <https://paiyencheng.com>

**Master of Science** Department of Electrical and Computer Engineering, Wayne State University

2017-2019 Detroit, MI, USA. Advisor: Dr. Amar Basu <http://microfluidics.wayne.edu/index.html>

**Bachelor of Science** Microelectronics of Science and Technology, Huazhong University of Science and Technology

2014-2017 Wuhan, PRC

## Research Areas

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Applied Electromagnetics, Microwave Circuits, non-Hermitian Systems, Radio-Frequency sensors, GFET Biosensors, Physically Unclonable Functions, Biomedical Monitoring Systems, Internet-of-Things, Wireless Sensors Networks,

## Teaching Experiences

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### Teaching Training: GC 510

09/2019-12/2019

- GC 510 is a course designed to help the teaching assistant to improve the overall ability to communicate in English in an academic setting.
- Learn and developed presentation skills for classroom and lab.
- Improve the pronunciation in classroom settings and student interactions.
- Develop better understanding of the cultural aspects of American universities.
- Obtain an oral English certification.

### ECE 346. Solid State Device Theory

09/2019-05/2020

- Teach basic experiments regarding measuring the conductivity of semiconductors, measuring carrier lifetime of minority carriers, studying the hall effect, investigating diode characteristics, and exploring the light emission and light detection phenomenon.

### ECE 115. Introduction to Electrical and Computer Engineering

09/2021-05/2022

- Introduce to the students the basic knowledge and skills of electrical and computer engineering. Deliver fundamental acknowledgement of MATLAB, constructing simple circuits on breadboard, being familiar with function generator, oscilloscope, multimeter and various lumped elements.

## Research Experiences

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### Ultrasensitive Optical and RF Sensors in Parity-Time (PT)-Symmetry

09/2019-07/2020

- Develop a theoretical model for analysis of spectral singularities in PT-Symmetry.

- Design and test the functionality of negative resistance converter using an OPAMP.
- Observe the coherent perfect absorption phenomenon and exceptional point (EP) experimentally.
- Achieve the detection toward ultrasmall perturbations, validation of ultrahigh sensitivity.

#### Ultra-robust Wireless Interrogation Systems with In-Vivo Implementations

04/2020-11/2021

- Develop a theoretical model for predicting the systems' behaviors around the EP.
- Design and test a Voltage-tunable negative resistance converter using a MOSFET.
- Achieve the accurate and robust detection of sensing information in spite of coil misalignment.
- Implement the interrogation system to intracranial pressure monitoring.

#### Physically Unclonable Functions in Optics and RF for Cyber Securities

03/2021-present

- Theoretically analyze the feasibility of constructing PUFs based on singular points of PT symmetry.
- Experimentally construct the PUF system based on CPAL points and obtain the PUF evaluations.
- Develop the GFET-based harmonic transponder system and GFET intermodulation system for sensing and PUF applications.
- Experimentally construct PUF system based on graphene devices with PUF evaluations.

#### High Gain/Directivity Leaky Wave Antenna Based on non-Hermitian Waveguide

06/2021-present

- Theoretically develop a non-Hermitian waveguide topology for achieving high gain and high directivity leak wave antenna.
- Validation with simulation results in HFSS, COMSOL.

#### Publications<sup>1-12</sup>

1. Farhat, M., **Yang, M.**, Ye, Z. & Chen, P.-Y. PT-Symmetric Absorber-Laser Enables Electromagnetic Sensors with Unprecedented Sensitivity. *ACS Photonics* **7**, 2080–2088 (2020). **IF:7.529**
2. **Yang, M.**, Ye, Z., Farhat, M. & Chen, P.-Y. Enhanced Radio-Frequency Sensors Based on a Self-Dual Emitter-Absorber. *Phys. Rev. Applied* **15**, 014026 (2021). **IF:4.985**
3. **Yang, M.**, Ye, Z., Farhat, M. & Chen, P.-Y. Ultrarobust Wireless Interrogation for Sensors and Transducers: A Non-Hermitian Telemetry Technique. *IEEE Trans. Instrum. Meas.* **70**, 1–9 (2021). **IF:4.016**
4. **Yang, M.**, Ye, Z., Farhat, M. & Chen, P.-Y. Cascaded PT-symmetric artificial sheets: multimodal manipulation of self-dual emitter-absorber singularities, and unidirectional and bidirectional reflectionless transparencies. *Journal of Physics D: Applied Physics* **55**, 085301 (2021). **IF:3.207**
5. **Yang, M.**, Ye, Z. & Chen, P.-Y. A Quantum-Inspired Biotelemetry System for Robust and Ultrasensitive Wireless Intracranial Pressure Monitoring. in *2021 IEEE Sensors* 1–4 (IEEE, 2021). doi:10.1109/SENSORS47087.2021.9639684.
6. Tan, X., **Yang, M.**, *et al.* Ultrasensitive and Selective Bacteria Sensors Based on Functionalized Graphene Transistors. *IEEE Sensors J.* 1–1 (2022) doi:10.1109/JSEN.2022.3147229. **IF:3.301**
7. Ye, Z., **Yang, M.**, Zhu, L. & Chen, P.-Y. PTX-Symmetric Metasurfaces for Sensing Applications. *Frontiers of Optoelectronics* (2021) doi:10.1007/s12200-021-1204-6. **IF:1.87 (Invited Paper)**
8. Ye, Z., **Yang, M.** & Chen, P.-Y. Multi-Band Parity-Time-Symmetric Wireless Power Transfer Systems for ISM-Band Bio-Implantable Applications. *IEEE J. Electromagn. RF Microw. Med. Biol.* 1–8 (2021) doi:10.1109/JERM.2021.3120621. **IF:3.3**
9. Ye, Z., **Yang, M.** & Chen, P.-Y. Multi-Band Parity-Time-Symmetric Wireless Power Transfer Systems. in *2021 IEEE Wireless Power Transfer Conference (WPTC)* 1–4 (IEEE, 2021). doi:10.1109/WPTC51349.2021.9457925.

10. **Yang, M.**, Ye, Z., Alsaab, N., Farha, M. & Chen, P. In-Vitro Demonstration of Ultra-Reliable, Wireless and Batteryless Implanted Intracranial Sensors Operated on Loci of Exceptional Points. *IEEE Trans. Biomed. Circuits Syst. Under Review*
11. **Yang, M.**, Ye, Z., Zhu, L., Hajizadegan, M. & Chen, P.-Y. A Lightweight, Zero-Power Intermodulation Sensor Based on the Graphene Oscillator. *IEEE Sensors J. Under Review*
12. Ye, Z. Ling, Y., **Yang, M.**, *et al.* A Breathable, Reusable and Zero-Power Smart Face Mask for Wireless Cough and Mask-Wearing Monitoring. *ACS Nano. Under Review*

## Skills

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Proficient in RF/microwave circuit design and test in PCB via OrCAD with simulation validation in ADS. Proficient in antenna design and validation in HFSS and COMSOL. Skilled on MATLAB and Mathematica for theoretical modeling of applied electromagnetics. Familiar with using Cadence Virtuoso for IC design, Silvaco for nanodevice simulation, LabVIEW for system control.

## Awards and Invited Talks

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Presented on the 2021 Sensors Council in Sydney for the section of “Emerging Sensor Applications”; Presented on the 2022 National Radio Science Meeting in Boulder for the section of “Structures and Circuits for RF Sensing, Radar and STAR Applications” and won the USNC-URSI Travel Award.