

HANWEI WANG

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EDUCATION

University of Illinois at Urbana-Champaign

2019-2024 (*expected*)

Doctor of Philosophy

Electrical and Computer Engineering Department

Overall GPA: 4.0/4.0

Tsinghua University

2015-2019

Bachelor of Science

Physics Department

Overall GPA: 3.6/4.0

SELECTED COURSES

Machine learning

Prof. Sanmi Koyejo

grade A

Computational Electromagnetics

Prof. Jianming Jin

grade A+

Atomic Physics & Quantum Theory

Prof. Vidya Madhavan

grade A+

Modern Methods in Materials Characterization

Dr. Mauro Sardela

grade A+

Integrated Circuit Device Theory & Fabrication

Prof. Xiuling Li

grade A

Advanced Biosensor

Prof. Brian Cunningham

grade A+

RESEARCH EXPERIENCE

Research Assistant

August 2019 - Present

University of Illinois at Urbana-Champaign

Urbana, Illinois, US

- Designed metasurface to selectively enhance a region of interest for magnetic resonance imaging. A journal paper is published as cover page in VIEW and a pattern is on file.
- Designed metasurface to form surface power flow and focus power for wireless power transfer. A journal paper and a pattern application are under review.
- Applied nanoantennas to generate plasmon-induced CD for chirality imaging. One review paper is published in Nanophotonics, and three paper are in writing.

Internship (undergraduate)

July - September 2018

The University of Hong Kong

Hong Kong

- Compared different driven modes for the omnidirectional WPT system and proposed an optimization algorithm for different loading scenarios. A first author journal paper is published in IEEE Transactions on Industrial Electronics, two journal papers are published in IEEE Transactions on Power Electronics, and a first author conference paper is published in WPTC 2019.

Internship (undergraduate)

January - March 2018

Massachusetts Institute of Technology

Boston, US

- Studied the magnetic field distribution of WPT system and proposed a position-free WPT technology using 3-D multiple transmitting coils driven by phase-shifted currents. A journal paper is published in IEEE Transactions on Energy Conversion and a conference paper is published on PowerMEMS 2018 (won the Best Demo Award).

TEACHING EXPERIENCE

Teaching Assistant*University of Illinois at Urbana-Champaign*

January - May 2022 (expected)

Urbana, Illinois, US

- Taught ECE 444 Theory and Fabrication of Integrated Circuits. This course teaches the physics, design, and fabrication of integrated circuit. The course is taught in a class 100 cleanroom, including silicon wafer cleaning, photolithography, wet chemical etching, doping, metal deposition, and characterization.

Teaching Assistant*University of Illinois at Urbana-Champaign*

August - December 2021

Urbana, Illinois, US

- Taught ECE 110 Introduction to Electronics. This is a fundamental circuit class. I taught one of the lab sections. I was ranked as excellent in the teaching evaluation.

Teaching Assistant*University of Illinois at Urbana-Champaign*

January - May 2021

Urbana, Illinois, US

- Taught ECE 418 Image and Video processing. This course covers the contents related to multidimensional signal processing, human visual perception and image & video processing. I was nominated by the class for the Olesen Award due to my good performance in teaching.

HONORS AND AWARDS

Hong, Mccully, and Allen Fellowship (2022)**Finalist of Illinois Innovation Award (2022)****Mavis Future Faculty Fellow (2022)****Yee Memorial Fund Fellowship (2022)****Hong, Mccully, and Allen Fellowship (2021)****Outstanding Bachelor Degree Thesis Award (2019)****Technological Innovation Scholarship (2019)****Special Award of Challenge Cup (2018)****Best Demo Award (2018)****iSPARK Innovation Scholarship (2017)****Xuetang Talent Program Scholarship (2016)****Gold Award of Shing-Tung Yau****Science Competition (2015)**

ECE Department of UIUC

The Grainger College of Engineering

The Grainger College of Engineering

The Grainger College of Engineering

ECE Department of UIUC

EE Department of Tsinghua University

Physics Department of Tsinghua University

Tsinghua University

PowerMEMS 2018 conference

Tsinghua University

Physics Department of Tsinghua University

Tsinghua University

PUBLICATIONS

1. **Hanwei Wang**, Sean Michael Meyer, Catherine J. Murphy, Yun-Sheng Chen, and Yang Zhao. "Visualizing ultrafast photothermal dynamics with decoupled optical force nanoscopy." Submitted.
2. **Hanwei Wang**, Yun-Sheng Chen, and Yang Zhao. "Understanding the Spatiotemporal Resolution of Near-Field Photoacoustics from Nanostructures." Submitted.
3. **Hanwei Wang**, Yun-Sheng Chen, and Yang Zhao. "A wearable metasurface for high efficiency, free-positioning omnidirectional wireless power transfer." *New Journal of Physics* 23.12 (2021): 125003.
4. Yun-Sheng Chen, Yang Zhao, Corinne Beinat, Aimen Zlitni, En-Chi Hsu, Dong-Hua Chen, Friso Achterberg, **Hanwei Wang**, Tanya Stoyanova, Jennifer Dionne, and Sanjiv Gambhir. "Ultra-high-frequency-radio-frequency-acoustic molecular imaging with saline nanodroplets in living subjects." *Nature Nanotechnology* 16.6 (2021): 717-724.

5. **Hanwei Wang**, Hsuan-Kai Huang, Yun-Sheng Chen, and Yang Zhao. "On-Demand Field Shaping for Enhanced Magnetic Resonance Imaging Using an Ultrathin Reconfigurable Metasurface." *View* (2021): 20200099. (Cover article)
6. **Hanwei Wang**, Cheng Zhang, Yun Yang, Rebecca Hui Wen Liang, and S. Y. Hui. "A Comparative Study on Overall Efficiency of 2-Dimensional Wireless Power Transfer Systems Using Rotational and Directional Methods." *IEEE Transactions on Industrial Electronics* (2021).
7. Nelson X. Wang, **Hanwei Wang**, Jie Mei, Sajjad Mohammadi, Jinyeong Moon, Jeffrey H. Lang, and James L. Kirtley. "Robust 3-D Wireless Power Transfer System Based on Rotating Fields for Multi-User Charging." *IEEE Transactions on Energy Conversion* 36.2 (2020): 693-702.
8. Rebecca Liang, **Hanwei Wang**, Chi-Kwan Lee, and SY Ron Hui. "Analysis and Performance Enhancement of Wireless Power Transfer Systems With Intended Metallic Objects." *IEEE Transactions on Power Electronics* 36.2 (2020): 1388-1398.
9. **Hanwei Wang**, Nusrat Jahan, Shensheng Zhao, Arkajit Dutta, Hsuan-Kai Huang, Yang Zhao, and Yun-Sheng Chen. "Optical force microscopy: combining light with atomic force microscopy for nanomaterial identification." *Nanophotonics* 8.10 (2019): 1659-1671.
10. **Hanwei Wang**, Cheng Zhang, and Shun Yuan Ron Hui. "Visualization of Energy Flow in Wireless Power Transfer Systems." 2019 IEEE Wireless Power Transfer Conference (WPTC).
11. **Hanwei Wang**, Maokun Li, Fan Yang, and Shengheng Xu. "Analysis of Quasi-Periodic Effect in the Design of the Nanorod Metasurfaces." 2019 13th European Conference on Antennas and Propagation (EuCAP) (pp. 1-4). IEEE.
12. **Hanwei Wang**, Nelson Xuntuo Wang, and Jeffrey H. Lang. (2019, November). "Simulation and Modelling of a Spatially-Efficient 3D Wireless Power Transfer System for Multi-User Charging." *Journal of Physics: Conference Series* (Vol. 1407, No. 1, p. 012104). IOP Publishing.

PATENTS

1. Yang Zhao, Hanwei Wang, and Yun-Sheng Chen. A Wearable Metasurface for High Efficiency, Free-Positioning Omnidirectional Wireless Power Transfer. United State Patent US 63,226,015. United States Patent and Trademark Office. (Provisional patent)
2. Yang Zhao, Hanwei Wang, and Yun-Sheng Chen. Ultrathin Reconfigurable Metasurface for Signal Enhancement of Magnetic Resonance Imaging. United State Patent US 63,130,600. United States Patent and Trademark Office. Dec 24, 2020. (Provisional patent, non-provisional patent under review)

PRESENTATIONS

1. "Surface-enhanced chirality transfer for ultrasensitive CD-spectroscopy of biomolecules," IGB Spring Theme Hop, poster presentation. Urbana, IL, US, April 2022.
2. "Highly Sensitive Chirality Detection using Plasmon-induced Force Microscopy," DREMES 2021 Summer Workshop, oral presentation. Online, July 2021.
3. "Surface-enhanced chirality detection for bio-molecules," IGB fellows symposium, poster presentation. Urbana, IL, US, Jan 2021.
4. "Reconfigurable metamaterials for MRI B_1 field enhancement," IGB Spring Theme Hop, poster presentation. Urbana, IL, US, May 2020.

5. "Analysis of Quasi-Periodic Effect in the Design of the Nanorod Metasurfaces," European conference on antennas and propagation 2019, poster presentation. Krakow, Poland, Mar 2019.
6. "Simulation and Modelling of a Spatially-Efficient 3D Wireless Power Transfer System for Multi-User Charging," PowerMEMS 2018, poster presentation. Daytona Beach, FL, US, Dec 2018.