**YICHAO WANG**

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**EDUCATION**

**UNIVERSITY OF CONNECTICUT** Storrs, CT, US

Ph.D., Electrical Engineering August 2021 - Current

**MINNESOTA STATE UNIVERSITY** Mankato, MN, US

Master of Science, Electrical Engineering **July 2021**

GPA: 3.91/4.00

**XI’AN POLYTECHNIC UNIVERSITY** Xi’an, Shaanxi, China

Bachelor of Science, Electrical Engineering and its Automation **July 2019**

Ranked 4th out of 144 in the comprehensive audit of the Electrical Engineering class of 2019

GPA: 2.80/4.00

**ENGINEERING/RESEARCH EXPERIENCES**

**2021-current** • Conducting research on resilient control for enhancing the security of multi-agent cyber-physical systems and the application to AC and DC microgrids.

• Co-authored and submitted an NSF career proposal titled “Advancing Human-Interactive Embodied Multi-Agent Systems with Reasoning, Resilient, and Safe Autonomy”, seeking $553,417 in funding from the National Science Foundation (NSF), with the funding decision pending.

**2019-2021** • Completed a thesis on the Analysis of Three-phase Rectifier via Three Different Control Methods and Comparison of Switch Power Loss.

•Tested equipment for a Four-port Bidirectional DC-DC Converter for Renewable Energy-Battery-DC Microgrid System under the guidance of Dr. Jianwu Zeng at Minnesota State University.

• Designed a VLSI full adder using Synopsys with gates constructed from CMOS transistors, designed independently.

• Developed and tested System Verilog code in Vivado to implement a Finite State Machine on a Nexys 4 DDR board, Artix FPGA from Xilinx.

• Implemented real-time systems on a B-L475E-IOT01A-STM32L475 board using FreeRTOS and CMSIS RTOS.

• Tested embedded systems using IOPT Petri Nets.

• Built and tested timed automata using Uppaal.

• Sampled data such as pressure, temperature, and humidity using the B-L475E-IOT01A-STM32L475 board, transmitting the results to a cellphone and webpage with adapted example code.

• Scanned available wireless network services using the B-L475E-IOT01A-STM32L475 board, displaying details such as security type, SSID, RSSI, MAC Address, channel, and offset on a UART terminal with adapted example code.

• Worked as a graduate research assistant on the Universal and Scalable Smart Grid Power Converter project, funded by Xcel Energy and supervised by Dr. Vincent Winstead at Minnesota State University. Designed an integrated circuit for sampling voltage and current in a Demo Grid using Altium Designer while conducting research on universal converters and filters.

• Participated in a site visit and training at Zipingpu Dam, Min River, near Dujiangyan, Sichuan Province, China, to observe its electrical system.

**2015-2018** • Completed a thesis on the Design of Arc Suppression Control System for Single-phase Grounding Fault in Resonant Grounding Systems.

• Participated in lab sessions accompanying coursework, focusing on high-voltage and insulation techniques.

• Conducted simulations of three-phase source synchronization to the grid as part of lab assignments.

• Simulated various grid faults and their detection and mitigation during practical lab sessions.

• Engaged in lab-based exercises on motor start-up and speed regulation techniques.

• Designed integrated circuits on the computer, following examples provided during coursework, and fabricated the circuits by soldering components onto boards during hands-on sessions at the Engineering Training Center, Xi’an Polytechnic University.

• Simulated power system protection methods as part of course-related labs.

• Attended site visits and training at Datang Huxian Thermal Power Plants in Xi’an, China to observe electrical system operations.

• Designed a timer on a breadboard using microprocessor chips as part of a senior design project.

• Completed training in the Engineering Machinery Portion at the Engineering Training Center, Xi’an Polytechnic University.

**OTHER EXPERIENCES**

• Participated in the Chinese-English Exchange (CEE) program, which attracted around 300 participants. In each session, I facilitated language exchange with smaller groups by teaching Chinese and sharing aspects of Chinese culture with domestic students, while also improving my English. Played a key role in fostering cross-cultural understanding and communication between participants.

**SKILLS**

**Languages**: • Native Speaker in Mandarin (Chinese).

• Proficient in English.

**Software**: Altium Designer, Matlab, Xilinx Design Tools (Vivado), Keil µVision, STM32CubeMx, System WorkBench, PowerWorld Simulator, Microsoft Office Suite.

**Programming Languages:**

Python, C, Matlab, SystemVerilog, Assembly, basic SQL (query language), TCTL (Timed Computation Tree Logic), Ladder Logic for PLCs.

**Other Skills:** Electrical Computer-Aided Design, PCB production, and soldering. Equipment testing with Digital Signal Processing (DSP).

**WORK EXPERIENCES**

**2021-current** • Teaching Assistant for the course “Systems Analysis and Design” and graduate level course “Introduction to System Theory”, and research assistant supervised by Prof. Shan Zuo in University of Connecticut.

**2020-2021** • Teaching Assistant for Finite Mathematics and Introductory Calculus, and Math Tutor for general math subjects for all math majors, supervised by Prof. Tyler Metzger at Minnesota State University.

**2019-2020** • Graduate research assistant supervised by Dr. Vincent Winstead in Minnesota State University.

**PUBLICATIONS**

**Google Scholar Link:** https://scholar.google.com/citations?hl=en&user=Ymhdx\_0AAAAJ

*Journals*

1. Wang, Yichao, Mohamadamin Rajabinezhad, and Shan Zuo. "Secondary Defense Strategies of AC Microgrids Under Polynomially Unbounded FDI Attacks and Communication Link Faults." *IEEE Control Systems Letters* (2024).
2. Zhang, Yi, Yichao Wang, Junbo Zhao, and Shan Zuo. "Resilient data‐driven asymmetric bipartite consensus for nonlinear multi‐agent systems against DoS attacks." *International Journal of Robust and Nonlinear Control* (2024).
3. Zuo, Shan, Yichao Wang, Mohamadamin Rajabinezhad, and Yi Zhang. "Resilient Containment Control of Heterogeneous Multi-Agent Systems Against Unbounded Attacks on Sensors and Actuators." *IEEE Transactions on Control of Network Systems* (2023).
4. Zuo, Shan, Yichao Wang, and Yi Zhang. "Resilient Synchronization of Heterogeneous MAS Against Correlated Sensor Attacks." In *2022 IEEE 61st Conference on Decision and Control (CDC)*, pp. 2276-2282. IEEE, 2022.
5. Zuo, Shan, Yi Zhang, and Yichao Wang. "Adaptive resilient control of ac microgrids under unbounded actuator attacks." *Energies* 15, no. 20 (2022): 7458.

*Conferences*

1. Zuo, Shan, Yichao Wang, and Yi Zhang. "Resilient Synchronization of Heterogeneous MAS Against Correlated Sensor Attacks." In 2022 IEEE 61st Conference on Decision and Control (CDC), pp. 2276-2282. IEEE, 2022.

**Papers (Accepted)**

1. Wang, Yichao, Mohamadamin, Rajabinezhad, Omar A. Beg, and Shan, Zuo, “Distributed Resilient Control of DC Microgrids Under Polynomially Unbounded FDI Attacks.” (IEEE PES 2025 Grid Edge Technologies Conference & Exposition).

**Papers (Under Review)**

1. Wang, Yichao, Mohamadamin, Rajabinezhad, and Shan, Zuo, “Resilient Bipartite Output Containment of Heterogeneous Multi-agent Systems Against Exponentially Unbounded Attacks.” (IEEE Transactions on Network Science and Engineering).

**Papers (Currently working on)**

1. Wang, Yichao, Mohamadamin, Rajabinezhad, Rui Liu, and Shan, Zuo, “Defense Strategies for Multi-agent Systems: Ensuring Safety and Resilience Under Exponentially Unbounded FDI Attacks.” (IEEE Robotics and Automation Letters).

**Some courses taken**

*In Ph.D Program*

1. Microgrids
2. Modeling and Control of Grid Connected Inverters
3. Digital Signal Processing
4. Advanced Power Electronics
5. Applied Probability and Stochastic Processes
6. Foundations of Control
7. Introduction to System Theory

*In Master’s Program*

1. Programmable Logic Design
2. VLSI Design Laboratory
3. VLSI Design
4. Advanced Embedded System Design
5. Real-time Embedded System
6. Wireless Networking
7. Design Methods
8. Smart Grid

*In Bachelor’s Program*

1. Electrical Systems of Power Plants
2. Electrical Engineering CAD (Computer-Aided Design)
3. Automation of Power System Dispatching
4. High Voltage Engineering
5. Power System Automation Technology
6. Comprehensive Professional Experiments
7. New Energy Power Generation Technology
8. Online Monitoring and Fault Diagnosis of Electrical Equipment
9. Signals and Systems
10. Enterprise Management and Technical Economic Analysis
11. Principles and Applications of PLC (Programmable Logic Controller)
12. Principles of Power System Relay Protection
13. Career Guidance for University Students
14. Principles and Applications of DSP (Digital Signal Processing)
15. Power Electronics Technology
16. Production Practice
17. Engineering Training (Electronics)
18. Transient Analysis of Power Systems
19. Principles of Automatic Control
20. Digital Electronic Technology Design Course
21. EDA (Electronic Design Automation) Technology and Verilog HDL (Hardware Description Language)
22. Steady-State Analysis of Power Systems
23. Digital Electronic Technology
24. Electromechanics
25. Computer Simulation of Power Systems (Bilingual)
26. Principles and Applications of Microcontrollers
27. Current Affairs and Policies IV
28. Probability Theory and Mathematical Statistics
29. Fundamentals of Electromagnetic Field Theory
30. College English IV
31. College Physical Education IV
32. Analog Electronic Technology
33. Smart Grid Sensors and Instruments
34. Analog Electronic Technology Design Course
35. Mental Health and Training
36. College Physics Laboratory II
37. Linear Algebra
38. College Physics II
39. College English III
40. Circuit Principles
41. Complex Functions and Integral Transforms
42. Current Affairs and Policies III
43. College Physical Education III
44. Spoken English
45. Engineering Mechanics
46. College Physics Laboratory I
47. Outline of Modern Chinese History
48. College English II
49. Programming
50. College Physical Education II
51. Introduction to Electrical Engineering
52. College Physics I
53. Current Affairs and Policies II
54. Fundamentals of Engineering Drawing
55. Advanced Mathematics II
56. Cognitive Practice
57. Engineering Training (Mechanical)
58. Behavior Analysis
59. College English I
60. Current Affairs and Policies I
61. Career Development for University Students
62. Safety Education
63. Advanced Mathematics I
64. Ideological and Moral Cultivation and Fundamentals of Law
65. College Physical Education I
66. Fundamentals of Computer Applications

**Awards**

1. Conference Participation Award, Graduate School, University of Connecticut, 2024.
2. Summer Predoctoral Fellowship, Department of Electrical and Computer Engineering, University of Connecticut, 2024.