

Guest Lecture for CEE Seminar Series “Quantum Technology Applications for Engineering Systems”

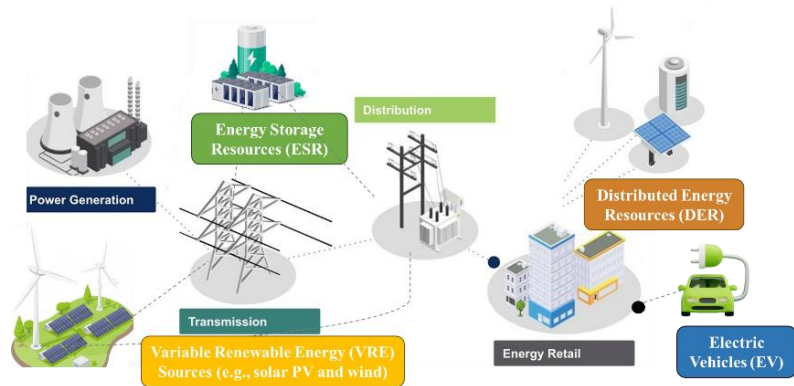
A Novel Integrated Quantum Computing Approach for Unit Commitment

1:00-2:00 pm, November 19, 2025

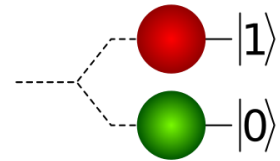
Virtual Meeting Link: [Quantum Seminar by Dr. Bing Yan | Meeting-Join | Microsoft Teams](#)

Guest Speaker: Bing Yan, Associate Professor, Rochester Institute of Technology

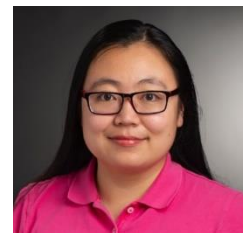
Abstract: The transition toward a decarbonized power grid introduces increasing operational complexity driven by variable renewable resources, distributed energy resources, electric vehicles, and energy storage resources. These dynamics require rapid and efficient solutions to the Unit Commitment (UC) problem, which classical computing may struggle. Quantum Computing (QC) offers a promising



alternative by exploiting qubits' exponential information capacity to accelerate large-scale optimization. In this talk, a novel integrated QC-based approach is developed to solve UC through synergistic integration of Quantum Feasibility Labeling (QFL), Variational Quantum Search (VQS), and Quantum Global Minimum Finder (QGMF). It enhances feasible-state identification and global optimum discovery, addressing the limitations of existing algorithms such as the Quantum Approximate Optimization Algorithm. Two illustrative UC case studies are used to demonstrate the approach. Simulation results indicate that the combined QFL-VQS-QGMF framework can identify the optimal UC solution accurately. This work highlights the potential of hybrid quantum-classical optimization as a foundational step toward scalable quantum solutions for future grid operations.



Bio Sketch. Dr. Bing Yan is currently an associate professor in the Department of Electrical and Microelectronic Engineering at Rochester Institute of Technology. She received the B.S. degree in information management and information system from Renmin University of China in 2010, M.S. degrees in electrical engineering and statistics from University of Connecticut in 2012 and 2017, respectively, and Ph.D. degrees in electrical engineering from University of Connecticut in 2016. Before joining Rochester Institute of Technology, she was an assistant research professor in the Department of Electrical and Computer Engineering, University of Connecticut. Dr. Yan's research interests include operation optimization of smart power and energy systems, planning and scheduling of intelligent manufacturing systems, and mathematical optimization of large-scale mixed-integer linear programming problems.



Dr. Yan has been working on many projects collaborated with industrial partners over the years, resulting in more than 30 peer-reviewed articles. Dr. Yan is the recipient of the NSF Faculty Early Career Development Program (CAREER) Award. Her research has been supported by NSF and DOE. She has multiple contracts from Brookhaven National Laboratory, ISO-New England, Mid-Continent ISO, and ABB. (Dr. Bing Yan: Email: bxyeec@rit.edu; Website: <https://www.rit.edu/directory/bxyeec-bing-yan>)