

# Jiahui (Clay) Yang

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 R&D 100 Award Winner (2025)

[Personal Website](#)

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## Education

Ph.D. in Electrical Engineering   University of Tennessee, Knoxville	Aug. 2024 - Present
M.S. in Electrical Engineering   Tianjin University	Sep. 2021 – Jul. 2024
B.S. in Electrical Engineering and Automation   Tianjin University	Sep. 2017 – Jul. 2021

## Projects

1. **Design and Development of PMU Hardware and Software (Real-Time PMU System).**
  - ✧ Managed and maintained the FNET/GridEye wide-area monitoring system under the supervision of Dr. Yilu Liu, supporting field deployment and system reliability.
  - ✧ Gained hands-on experience with PMU and waveform measurement hardware (ADC sampling, GPS/PPS timing, FNET protocol & IEEE Standard C37.118-compliant data transmission).
  - ✧ Implemented and optimized synchrophasor estimation for real-time embedded platforms.
  - ✧ Debugged and resolved system-level issues across new PMU hardware, timing, and frequency estimation, such as PCB hardware bring-up challenges, DFT timing shift, and GPS/PPS timing.
2. **Design of a New High-Precision Timing Source (FPGA + ADC + PPS).**
  - ✧ Used a signal generator to emulate pulsar profiles and employed a high-rate ADC for sampling.
  - ✧ Developed FPGA firmware to process raw samples in real time and stream high-throughput data to a server over a 10-GbE interface and PF\_RING package.
  - ✧ Applied polyphase filter bank processing, folding, and period estimation to extract pulsar period and calibrate the local oscillator, generating a highly accurate PPS output synchronized to GPS.
3. **Key technologies of digital power grid (edge computing + data compression).**
  - ✧ Collaborated with **China Southern Power Grid** on the design of edge-computing devices for distribution grids, supporting integrated monitoring, protection, control, and PMU capabilities.
  - ✧ Worked with container-based embedded infrastructure enabling modular deployment.
  - ✧ Designed and implemented real-time PMU data compression algorithms achieving high accuracy and high compression ratio for large-scale data transmission and storage.

## Publications

1. Real-time D-PMU data compression for edge computing devices in digital distribution networks. **Jiahui Yang**, Hao Yu, Peng Li, et al. **IEEE Transactions on Power Systems**, 2024, 39(4).
2. Lightweight data-driven planning method of hybrid energy storage systems in the new power system. Yanda Huo, **Jiahui Yang (Corresponding Author)**, et al. **IEEE Transactions on Industry Applications**, 2024.
3. A hybrid system for high-accuracy timekeeping using millisecond pulsars[C]//2025 Joint Conference of the European Frequency and Time Forum and IEEE International Frequency Control Symposium (EFTF/IFCS). Yuru Wu, **Jiahui Yang**, Yongxin Zhang, et al. IEEE, 2025: 1-4.
4. Time synchronization techniques in the modern smart grid: A comprehensive survey. Yu Liu, Biao Sun, Yuru Wu, Yongxin Zhang, **Jiahui Yang**, et al. **Energies**, 2025, 18(5), 1163.

## Skills

**Programming:** C/C++, Python, MATLAB.

**Embedded system:** Raspberry Pi, STM32, DSP, FPGA, ESP32, Ublox (GPS), Arduino.

**Software:** PSSE, PSCAD, Altium/KiCad, Keil, Simulink, Microsoft Office

**Cloud server:** Amazon EC2, Microsoft Azure, Google Cloud; Linux, Windows.