

Yifan Dong

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Profile

- I am a third-year Ph.D. student in Electrical and Computer Engineering with a strong academic background and hands-on experience in system-level optimization, especially for coupled power-transportation system. I am skilled in programming languages such as Python and MATLAB. I am looking for an internship for Summer 2026.

Education

Purdue University, West Lafayette, IN

Aug 2023 – Present

Ph.D. student in Electrical and Computer Engineering

- Research interest: Optimization for coupled infrastructure systems
- GPA: 3.83/4.0 [Up-to-date transcript]
- Coursework: Computational Method in Optimization, Convex Optimization, Computational Method for Power System Analysis, Optimization for Deep Learning, Algorithm Design, Analysis and Implementation, etc.

North China Electric Power University, Beijing, China

Aug 2019 – June 2023

BS in Electrical Engineering and its Automation

- GPA: 4.31/5.0 (Top 1%) [Transcript]
- Coursework: Power System Analysis, Power System Economy and Management, Automatic Control Theory, etc.

Publications

- Yifan Dong, Ge Chen, Junjie Qin, "**Federated Aggregation of Demand Flexibility**", submitted to *IEEE Transactions on Smart Grid*, 2025. [arXiv]
- Yifan Dong, Ge Chen, Junjie Qin, S. Sivaranjani, Xiaonan Lu, Dionysios Aliprantis, David Love, "**Real-Time Charging Control for Electric Roadways**", submitted to *IEEE Transactions on Smart Grid*, 2025.
- Yifan Dong, Junjie Qin, S. Sivaranjani, Xiaonan Lu, Dionysios Aliprantis, David Love, "**Real-Time Charging Control for Electric Roadways: Formulation and Causal Algorithms**", *2024 IEEE Power & Energy Society General Meeting*.

Experiences

Research Assistant: ASPIRE Research Center

Aug 2023 – Present

- *Project 1: Privacy-Preserving Demand Flexibility Aggregation for Flexible Loads*
 - Designed a **novel end-to-end federated framework** for demand flexibility aggregation, where each user keeps sensitive and high-dimensional data local, and **shares only anonymized and low-dimensional information**.
 - Reformulated the bi-level, centralized optimization problem into a **single-level, unconstrained learning task**, and developed a **decentralized, gradient-based algorithm** to efficiently solve this task.
 - Empirically evaluated the proposed framework on practical flexibility use cases, showing **substantially larger aggregate flexibility** compared to existing methods.
 - Tools used: PyTorch, CvxpyLayer.
- *Project 2: Charging Control Policy for Electric Roadways*
 - Established a **novel clairvoyant formulation** for wireless charging control, which connects the electric roadway microgrid and electric vehicles (EVs) through *dynamic wireless power transfer* (DWPT) systems.
 - Developed a **causal, real-time charging control policy** for DWPT charging control, mitigating the dependency on future information. Mathematically proved the optimality of the algorithm under an ideal setting.
 - Numerically validated the policy with diverse traffic cases under practical settings, showing **low suboptimality and constraint violation**.
 - Tools used: MATLAB, Python, SUMO.

Teaching Assistant: Purdue University

Aug 2024 – Dec 2024

- *ECE 31032: Power Systems Engineering*
 - Supported instruction on economic dispatch, transformers, power system modeling and power flow analysis.

Presentations

- "Federated Aggregation of Demand Flexibility", 2025 ASPIRE Annual Meeting, Logan, UT [Poster]
- "Real-Time Charging Control for Electric Roadways", 2024 ASPIRE Annual Meeting, Logan, UT [Poster]
- "Real-Time Charging Control for Electric Roadways", 2024 IEEE PES General Meeting, Seattle, WA [Poster]