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Education

- Sep. 2023 – Present **Ph.D. in Software Engineering**, Chongqing University (CQU), Chongqing, China.
Thesis title: *Deep Reinforcement Learning for User-side Energy Management oriented to Multi-level Heterogeneity*.
(Supervised by Dr. Fengji Luo (The University of Sydney) and Prof. Junhao Wen (CQU))
- Jun. 2026 – Jun. 2027 **Joint-Training Ph.D. (Visiting)**, Nanyang Technological University (NTU), Singapore.
(Supervised by Hosted by Asst. Prof. Yuguang Fu and Assoc. Prof. Chau Yuen (School of EEE) (China Scholarship Council State-Sponsored Program))
- Sep. 2020 – Apr. 2023 **M.E. in Energy and Power Engineering**, Nanjing University of Aeronautics and Astronautics (NUAA), Nanjing, China.
Thesis title: *Research on Sensor Fault Diagnosis and Remaining Useful Life Prediction of Aero-Engine*.
(Supervised by Prof. Haibo Zhang (NUAA) and Prof. Jiqiang Wang (Ningbo Institute of Materials Technology, CAS))
- Sep. 2015 – Jun. 2019 **B.E. in Renewable Energy Science and Engineering**, Chongqing University (CQU), Chongqing, China.
Thesis title: *Dynamic characteristics of DSG collectors for concentrating solar thermal power generation systems*.

Research Publications

First-author

1. **X. Du**, F. Luo, J. Hu, W. Zhou, and J. Wen, "Adaptive home energy management to self-motivated user preferences via iterative llm-augmented reinforcement learning," *Applied Energy*, vol. 415, p. 127 976, 2026, (IF 12.2).
2. **X. Du**, F. Luo, J. Hu, W. Zhou, and J. Wen, "Causally aligned multi-agent reinforcement learning for coordinated control of heterogeneous home energy devices," *IEEE Internet of Things Journal*, vol. 13, no. 10, pp. 22 300–22 313, 2026, (IF 8.7).
3. **X. Du**, F. Luo, J. Hu, W. Zhou, and J. Wen, "Generalizable zero-shot home energy management via representation learning and behavioral cloning," *Applied Soft Computing*, p. 115 110, 2026, (IF 7.8).
4. **X. Du**, F. Luo, J. Lan, J. Liao, W. Zhou, and J. Wen, "Conditional policy parameter diffusion for cold-start drl deployment in heterogeneous home energy management," *IEEE Transactions on Neural Networks and Learning Systems*, 2026, (Under Review; IF 9.7).
5. **X. Du**, F. Luo, J. Lan, W. Zhou, and J. Wen, "Contrastive preference learning from user overrides for personalized home energy management," *IEEE Transactions on Smart Grid*, 2026, (Accepted; IF 10.1).
6. **X. Du**, F. Luo, J. Liao, W. Zhou, and J. Wen, "Learning when to control: Adaptive multi-timescale home energy management with action decomposition," *Journal of Building Engineering*, 2026, (Under Review; IF 8.1).

- 7 **X. Du**, J. Chen, J. Wang, H. Zhang, and J. Wen, "Fusion-based dual-task architecture for predicting the remaining useful life of an aeroengine," *Journal of Aerospace Engineering*, vol. 38, no. 3, p. 04 025 004, 2025, (IF 1.6).
- 8 **X. Du**, J. Chen, H. Zhang, and J. Wang, "Fault detection of aero-engine sensor based on inception-cnn," *Aerospace*, vol. 9, no. 5, p. 236, 2022, (IF 2.5).
- 9 **X. Du**, X. Wang, and J. Wang, "Nonlinear control design of aero-engine based on ngmv," in *Proceedings of 2021 Chinese Intelligent Systems Conference: Volume I*, Springer, 2021, pp. 174–182.

Co-authored

- 1 J. Chen, F. Yu, **X. Du**, X. Chen, J. Wang, and X. Sun, "Multienergy management control schedule design method for parallel hybrid electric turbofan engine under different flight conditions," *Journal of Aerospace Engineering*, vol. 39, no. 1, p. 04 025 105, 2026, (IF 1.6).
- 2 J. Hu, R. Dong, **X. Du**, H. Shen, W. Zhou, and J. Wen, "Building sequential recommendation models upon thermoelastic spectral operators," in *ACM International Conference on Information and Knowledge Management (CIKM)*, (Under Review; CCF B), ACM, 2026.
- 3 J. Hu, H. Shen, **X. Du**, C. Chen, W. Zhou, and J. Wen, "Revisiting recurrent model for sequential recommendation: Matrix memory and spectral gate," *Expert Systems With Applications*, 2026, (Under Review; IF 9.4).
- 4 J. Hu, H. Shen, **X. Du**, W. Zhou, and J. Wen, "Gqsar: Grouped residual quantization for latent semi-autoregressive generative recommendation," *Expert Systems With Applications*, 2026, (Under Review; IF 9.4).
- 5 J. Hu, W. Zhou, H. Cai, **X. Du**, H. Shen, and J. Wen, "Gated rotary-enhanced linear attention with rank modulation for long-term sequential recommendation," *arXiv preprint arXiv:2506.13315*, 2025.
- 6 R. An, J. Chen, **X. Du**, H. Zhang, and J. Wang, "A novel method of vibration control for internal and external cases of aero-engines based on geometric design method.," *Journal of Nanjing University of Aeronautics & Astronautics*, vol. 55, no. 4, 2023.

Startup

- May 2026 – Present
- 📖 **Cairnova — Founder.** Redesigning personal tools for the age of AI, so that intelligence belongs to everyone. cairnova.net
 - 📖 **Whimsy** — No summarizing, no filing — a save-it-all app that tidies up after you (iOS + FastAPI + LLM). I lead product & iOS development.
 - 📖 **DeskMate** (In development) — A desktop embodied-AI teaching device for teenagers, turning the broad knowledge behind large models into hands-on, learnable interactions at the desk.

Experience

Research & Projects

- Jan. 2021 – Dec. 2024
- 📖 *Research on Service Recommendation of Trusted Sharing and Heterogeneous Data Fusion in Mobile Crowd Sensing Environment*, National Natural Science Foundation of China, 570,000 RMB. (Participant)
 - 📖 *Research on Abnormal Content Detection of Public Emergencies Based on Cross-platform Data Fusion*, National Natural Science Foundation of China, 480,000 RMB. (Participant)

Experience (continued)

Feb. 2021 – Apr. 2023  *Aero-engine Prognostic and Health Management (PHM) Simulation Platform*, NUAU, 99,000 RMB. (Principal Investigator)

Student Projects

Sep. 2020 – Apr. 2021  *Co-simulation and Nonlinear Controller Design of Aero-engine*, NUAU

Jan. 2019 – May 2020  *Study on Dynamic Characteristics of DSG Collector of Concentrated Solar Thermal Power System*, CQU

Aug. 2017 – Apr. 2019  *Fully Automatic VOCs Purification System based on Plasma Catalytic Technology*, SRTP Program and Energy Conservation and Emission Reduction Competition, CQU

Feb. 2018 – Jun. 2018  *New Waste Oil Detection Tool*, "Shusheng Vanguard" Innovation and Entrepreneurship Competition, CQU

Aug. 2017 – May 2018  *New Maintenance-free Water-saving Water Heater*, Energy Conservation and Emission Reduction Competition, CQU

Awards and Achievements

2024  **China Scholarship Council (CSC) Scholarship for state-sponsored overseas study**, China Scholarship Council

2023  **Outstanding Master's Graduate**, NUAU

2021–2023  **First Class Academic Scholarship**, NUAU

2018  **Third Prize, Energy Conservation and Emission Reduction Competition**, CQU

 **Bronze Award, "Shusheng Vanguard" Innovation and Entrepreneurship Competition**, CQU

2017  **Outstanding Self-dependent and Self-motivated Individual**, Chongqing City

2016  **Outstanding Innovative and Entrepreneurial Individual**, CQU

2015  **Outstanding Student**, CQU

 **Exemplary Member of the Student Association**, CQU

Service

Reviewer Service

Journals  IEEE Transactions on Smart Grid, Applied Energy, IEEE Transactions on Industrial Informatics, IEEE Transactions on Computational Social Systems, Digital Signal Processing, Chinese Journal of Aeronautics

Conferences  22nd International Conference on Principles of Knowledge Representation and Reasoning (KR 2025)

Student Service

2026 – Present  **Student President**, Chongqing Student Association of China Computer Federation (CCF)

Nov. 2020 – Aug. 2021  **Volunteer**, International Conference on Applied Nonlinear Dynamics, Vibration, and Control (ICANDVC) 2021, Zhuhai, Guangdong, China

Aug. 2018  **Volunteer**, Smart China Expo 2018, Chongqing, China

Sep. 2023 – Oct. 2024  **Disciplinary Secretary**, 1st Graduate Party Branch, School of Big Data and Software Engineering, CQU

Service (continued)

Sep. 2020 – Apr. 2023	■ Youth League Secretary , Control Class of 2020, School of Energy and Power, NUAA
	■ Disciplinary Secretary , Control Class Party Branch of 2020, School of Energy and Power, NUAA
Sep. 2017 – Jun. 2019	■ Youth League Secretary , Renewable Energy Class of 2015, School of Energy and Power, CQU
Sep. 2016 – Jun. 2019	■ Youth League Secretary , Grade 2015, School of Energy and Power, CQU
Sep. 2015 – Aug. 2017	■ Monitor / Vice Monitor , Class 5 of 2015, School of Energy and Power, CQU
Sep. 2015 – May 2018	■ Director / Vice Director / Clerk , Branch Construction Center, Organization Dept., CQU Youth League
May 2016 – May 2017	■ Vice Minister / Clerk , "Entrepreneurs" Student Association, CQU
Sep. 2015 – May 2017	■ Vice Minister / Clerk , "Future Entrepreneurs" Student Association, CQU

Skills

Languages	■ English, Mandarin Chinese (native)
Coding	■ Python, Matlab/Simulink, C, HTML5, JavaScript, LaTeX, ...
Tools	■ Docker, Torch, TensorFlow, Django, PyQt, App Designer, Pandas, Numpy, ...
Other	■ Office suite, Adobe Photoshop/Premiere/InDesign, ...