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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 (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*, 2026, (Accepted; 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, H. Shen, **X. Du**, J. Wen, and W. Zhou, "Revisiting recurrent model for sequential recommendation: Matrix memory and spectral gate," *Information Sciences*, 2026, (Under Review; IF 6.0).
- 3 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.
- 4 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)
- Feb. 2021 – Apr. 2023
- 📖 *Aero-engine Prognostic and Health Management (PHM) Simulation Platform*, NUAA, 99,000 RMB. (Investigator)

Student Projects

- Sep. 2020 – Apr. 2021
- 📖 *Co-simulation and Nonlinear Controller Design of Aero-engine*, NUAA
- Jan. 2019 – May 2020
- 📖 *Study on Dynamic Characteristics of DSG Collector of Concentrated Solar Thermal Power System*, CQU

Experience (continued)

- 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**, NUA
- 2021–2023  **First Class Academic Scholarship**, NUA
- 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
- Sep. 2020 – Apr. 2023  **Youth League Secretary**, Control Class of 2020, School of Energy and Power, NUA
-  **Disciplinary Secretary**, Control Class Party Branch of 2020, School of Energy and Power, NUA
- 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

Service (continued)

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, ...