Hongyi Duan

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EDUCATION

- **Xi'an Jiaotong University (XJTU)** — **Xi'an, China**
  Bachelor of Engineering — *Aug. 2021 – Jun. 2025*
  Computer Science and Technology (XJTU Academic Elite Program)
  GPA 3.44/4.30
- **The University of Melbourne (Unimelb)** — **Melbourne, Australia**
  Study Aboard &Exchange Program — *Aug. 2023 – Jun. 2024*
  Computer Science

SELECTED PUBLICATIONS

* Donate equal contribution

1. Jianan, Z.*, & **Hongyi, D.*** (2023). Enhanced LFTSformer: A Novel Long-Term Financial Time Series Prediction Model Using Advanced Feature Engineering and the DS Encoder Informer Architecture. arXiv:2310.01884.
   Pre-print. Currently under review at IEEE Access (ISSN: 2169-3536 JCR-3).
   https://doi.org/10.48550/arXiv.2310.01884
2. Yuchen, L., Qingyang, L., **Hongyi, D.,** Donghe, L.(2024). Cognitive-Inspired Load Forecasting: An Enhanced Transformer-based Approach with NILM-derived Features
   Currently under review at IEEE Transactions on Automatic Control (ISSN: 0018-9286 JCR-2).
   https://www.overleaf.com/read/dtsbrnwxmgjd#a8ada1
3. Qingyang, L., Yuchen, L., **Hongyi, D**., Jialing, K., Jianan, Z., Xueqian, G & Ruotong, X.(2023). Improvement and Enhancement of YOLOv5 Small Target Recognition Based on Multi-module Optimization. arXiv preprint arXiv:2310.01806.
   Pre-print. Currently under review at Journal of Shanghai Jiaotong University(Science) (ISSN: 1995-8188)
   https://doi.org/10.48550/arXiv.2310.01806
4. **Hongyi, D.,** Qingyang, L., Yuchen, L., Tianjiao, J., Jianan, Z & Yuming, X.(2024). Comparative Study of Microgrid Optimal Scheduling Under Multi-optimization Algorithm Fusion, 2023 10th International Forum on Electrical Engineering and Automation (IFEEA), Nanjing, China, 2023, pp. 1082-1092. IEEE.
   Conference Paper, Published at IFEEA 2023.
   https://doi.org/10.1109/IFEEA60725.2023.10429466
5. **Hongyi, D**., Yuchen, L., Qingyang, L., Yiyi, W., Yuming, X & Haohui, P.(2023). Application and Analysis of Machine Learning Based Rainfall Prediction. In 2023 8th International Conference on Intelligent Computing and Signal Processing (ICSP)(pp. 1941-1949). IEEE.
   Conference Paper, Published at ICSP 2023.
   https://doi.org/10.1109/icsp58490.2023.10248891
6. Jianan, Z., **Hongyi, D** & Yuchen, L.(2023). Analyzing Bridge Resonance and Lateral Vibrations Using String Vibration Principles. arXiv preprint arXiv:2311.11061.
   Pre-print. Currently under review at Journal of Shanghai Jiaotong University(Science) (ISSN: 1995-8188)
   https://doi.org/10.48550/arxiv.2311.11061
7. Junhua, L., **Hongyi, D**., Jianan, Z & Yichi, Z.(2023). Preliminary Investigation of the Anti-fuzzy Ring Isomorphism Theorem. In 3rd International Conference on Applied Mathematics, Modelling, and Intelligent Computing (CAMMIC 2023) (Vol. 12756, pp. 857-864). SPIE.
   Conference Paper, Published at CAMMIC 2023.
   https://doi.org/10.1117/12.2685993
8. Jianan, Z., **Hongyi, D** & Bingsong, T.(2023). Epidemic Prediction Based on Entropy-improved Factor Analysis and WOA- optimized BP Network Algorithm. In International Conference on Computer, Artificial Intelligence, and Control Engineering (CAICE 2023) (Vol. 12645, pp. 911-919). SPIE.
   Conference Paper, Published at CAICE 2023.
   https://doi.org/10.1117/12.2681323
9. **Hongyi, D**., Jianan, Z & Haohui, P.(2023). BP Neural Network Based Wireless Sensor Network for Solar Energy Prediction. In 2nd International Conference on Algorithms, Microchips, and Network Applications (AMNA 2023)(Vol. 12635, pp. 299-313). SPIE.
   Conference Paper, Published at AMNA 2023.
   https://doi.org/10.1117/12.2678916
10. **Hongyi, D** & Jianan, Z.(2023). Nuclear Weapon Prediction Based on the Verhulst Method of Comprehensive Weighting and LS- SVM Equidimensional Information Supplement. In 2nd International Conference on Algorithms, Microchips, and Network Applications (AMNA 2023)(Vol. 12635, pp. 299-313).SPIE.
    Conference Paper, Published at AMNA 2023.
    https://doi.org/10.1117/12.2678905

EMPLOYMENT EXPERIENCE

- **Deep Learning Algorithm Engineer** **Apple Inc.**
  Internship. *May. 2024 – Sep. 2024*
  Assisted in the development and refinement of Apple's MLX Deep Learning Framework.

RESEARCH & ACADEMIC EXPERIENCE

- **Grid Metrics Forecasting and Microgrid Scheduling Study** **XJTU**
  Research Assistant in Automatic Control Center; Advisor: Prof. Qingyu Yang. *Feb. 2022 – Present*
  Proposed NILMformer, a novel Transformer-based model to improve household load forecasting accuracy using non-intrusive load monitoring, designed a grid scheduling model based on a multi-fusion optimization algorithm.
- **2023 Winter Frontier Research Program: Deep Learning in Computer Vision** **MIT**
  Student and Student Representative; Advisor: Prof. Alexander Amini. *Jan. 2022 - Mar. 2022*
  Designed an attention mechanism-optimized YoloV5 pattern recognition model.
- **Fuzzy Mathematics and Numerical Analysis Research** **SUFE**
  Research Assistant in Professor Xu Dinghua' s team; Advisor: Prof. Dinghua Xu. *Dec. 2022 - Feb. 2023*
  Demonstrated the isomorphism theorem of the anti-fuzzy ring based on anti-fuzzy group isomorphism, designed a numerical analysis model for bridge vibration.
- **Reviewer of Computational Economics (ISSN: 1572-9974, JCR-4)** **CSEM**
  Reviewer; Editor in handling: Fredj Jawadi, PhD. *Nov. 2023 - Present*
  Reviewed several manuscripts in the fields of data science, economics, and related areas as a peer reviewer.

PROJECT & CLUB EXPERIENCE

- **China University Computer Competition 2022**(WeChat Applets Development) **XJTU**
  Member; Advisor: Assoc. Prof. Tao Xie. *Oct. 2021 – Jun. 2022*
  Built a WeChat applets called XJTU Cloud Guides (unreleased) using WXML/CSS/JavaScript.
- **XJTU Rùn Academic Club** **XJTU**
  Founder and Leader. *Jan. 2022 – Present*
  Founded the academic exchange organization among students, organized several machine learning projects.

PRESENTATIONS

- **2024 6th National Development Youth Forum.** *Apr 2024*
  Organizer : National School of Development at Peking University
  Outstanding paper invited talk.
- **2023 8th International Conference on Intelligent Computing and Signal Processing.** *May 2023*
  Organizer : ICSP 2023 Committee, Xi'an Shiyou University
  Best paper invited talk.

AWARDS

- **Xi'an Jiaotong University Academic Elite Program** *2021-2025*
  Academic Elite Program Scholarship (240000 RMB in total).
- **2023 8th International Conference on Intelligent Computing and Signal Processing** *2023*
  Best Paper Award.
- **China International College Students' Innovation Competition 2023** *2023*
  Outstanding work of Shannxi Province.
- **China International College Students' Innovation Competition 2022** *2022*
  Outstanding work of XJTU.

KEY SKILLS (RANKED BY PROFICIENCY)

- **Machine Learning/Data Analysis**
  Deep Learning: *CNNs, Transformer/Informer, RNN/LSTM.*
  Machine Learning: *SVM, KNN, Fuzzy Rules, Decision Trees, Bayes.*
- **Programming:** *C/C++, MATLAB, Python/Pytorch, SQL, Javascipt, System Verilog, 8086 Assembly.*
- **Documentation:** *Latex, Markdown, Microsoft Office, Jupyter Notebook , XML/HTML.*
- **Design:** *Multism, Modelsim.*
- **Skills:** *Git/Github, Ubuntu/Linux, Anaconda.*

MEMBERSHIP

- **IEEE & IEEE Computer Society** *2022 - Present*
  Student member | Member number: 98983270.
- **ACM & ACM Xi'an Section** *2022 - Present*
  Student member | Member number: 8641608.