Jiashu Wu

Ph.D., University of Chinese Academy of Sciences

DoB: 13th Jun 1997, Hometown: Beijing, China

Phone/WeChat: 17801323125

Email: wujiashu21@mails.ucas.ac.cn

Homepage: jiashuwu.github.io

Education

University of Chinese Academy of Sciences — Beijing & Shenzhen, China
Doctor of Philosophy in Computer Science — Sept 2021 - Jul 2024
Research topic: Domain adaptation-based IoT intrusion detection, Advisor: Prof. Yang Wang, GPA: 3.98 (91.7)
Faculty: Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences

University of Melbourne — Melbourne, Australia
Master of Information Technology (with Distinction) — Mar 2019 - Dec 2020
Major: Artificial Intelligence, Advisor: Prof. Rui Zhang, GPA: 4.0 (88.1, First Class Honour, top 2%)

University of Sydney — Sydney, Australia
Bachelor of Science — Jan 2016 - Dec 2018
Double Major: Computer Science, Financial Mathematics & Statistics, Advisor: Prof. Simon Poon
GPA: 3.96 (86.5, High Distinction, top 2%)

Beijing Institute of Technology — Beijing, China
Major: Software Engineering, transferred to USYD in 2016 (Verified via Chsi.com) — Sept 2015 - Jan 2016

Research Interests

Tackling IoT intrusion detection via domain adaptation. Design accurate and efficient algorithms for data-scarce scenarios such as unsupervised and open-set DA. Challenges including domain heterogeneities and the avoidance of under-transfer and negative-transfer.
Key skills: Network data analysis, intrusion detection, feature engineering, transfer learning, statistical analysis, performance optimisation, paper and patent writing.

Publications

I have published **9 CCF-A/JCR Q1 papers** and have 3 IEEE/ACM Trans/CCF-A papers under review. I have **8 patents being granted** and 11 patents under examination. **Key topics**: Network data analysis, transfer learning, IoT security, data caching and storage, etc. Below are selected publications.

1. Adaptive Bi-Recommendation and Self-improving Network for Heterogeneous Domain Adaptation-assisted IoT Intrusion Detection
   Jiashu Wu, Yang Wang✉, Hao Dai, Chengzhong Xu, Kenneth B. Kent
   IEEE Internet of Things Journal (**IEEE IoTJ**, **JCR Q1**, **IF=10.6**), 2023

2. Heterogeneous Domain Adaptation for IoT Intrusion Detection: A Geometric Graph Alignment Approach
   Jiashu Wu, Hao Dai, Yang Wang✉, Kejiang Ye, Chengzhong Xu
   IEEE Internet of Things Journal (**IEEE IoTJ**, **JCR Q1**, **IF=10.6**), 2023

3. Cost-Efficient Sharing Algorithms for DNN Model Serving in Mobile Edge Networks
   Hao Dai, **Jiashu Wu**, Yang Wang✉, Jerome Yen, Yong Zhang, Chengzhong Xu
   IEEE Transactions on Services Computing (**IEEE TSC**, **CCF-A**, **IF=11.0**), 2023

4. Joint Semantic Transfer Network for IoT Intrusion Detection
   Jiashu Wu, Yang Wang✉, Binhui Xie, Shuang Li, Hao Dai, Kejiang Ye, Chengzhong Xu
   IEEE Internet of Things Journal (**IEEE IoTJ**, **JCR Q1**, **IF=10.6**), 2022

5. PackCache: An Online Cost-driven Data Caching Algorithm in the Cloud
   Jiashu Wu, Hao Dai, Yang Wang✉, Yong Zhang, Dong Huang, Chengzhong Xu
   IEEE Transactions on Computers (**IEEE TC**, **CCF-A**, **IF=3.7**), 2022

6. Simultaneous Semantic Alignment Network for Heterogeneous Domain Adaptation
   Shuang Li, Binhui Xie, **Jiashu Wu**, Ying Zhao, Chi Harold Liu✉, Zhengming Ding
   ACM International Conference on Multimedia (**ACM MM**, **CCF-A**), 2020, Seattle, WA, USA

7. Towards Scalable and Efficient Deep-RL in Edge Computing : A Game-based Partition Approach
   Hao Dai, **Jiashu Wu**, Yang Wang✉, Chengzhong Xu
   Journal of Parallel and Distributed Computing (**JPDC**, **JCR Q1**, **IF=3.8**), 2022

8. Open Set Dandelion Network for IoT Intrusion Detection
   Jiashu Wu, Hao Dai, Yang Wang✉, Kenneth B. Kent, Chengzhong Xu
   Under review at *ACM Transactions on Internet Technology* (**ACM TOIT**, **JCR Q1**, **IF=5.3**), 2023

9. HI-CPT: Towards Verifiable IoT Intrusion Detection under Data-scarce Heterogeneous Environment
   Jiashu Wu, Hao Dai, Yang Wang✉, Kejiang Ye, Chengzhong Xu
   Under review at *IEEE Transactions on Cybernetics* (**IEEE TCYB JCR Q1**, **IF=11.8**), 2023

Project and Internship Experience

Project and Internship topics: Network data analysis, transfer learning, intrusion detection, model caching and distributed training, data stream analysis, secure and efficient data storage, etc. Below are selected projects.

Research on IoT Intrusion Detection via Domain Adaptation Approach
Ph.D. research topic, internship at BIT during Nov 2019 - Feb 2020

- Tackle IoT intrusion detection via domain adaptation. Propose 5 algorithms targeting scenarios with diverse data scarcity. Tackle domain heterogeneity and negative transfer via self supervision, probabilistic semantics, etc.
- The proposed algorithms improve IoT intrusion detection accuracy by 4%-17%, the efficacy of proposed mechanisms are statistically verified. Low latency makes the proposed algorithms feasible for IoT security monitoring.
- **Key skills**: network data analytics, transfer learning, feature engineering, Python programming, performance optimisation and academic writing. Published 5 CCF-A/JCR Q1 papers and 4 patents.

Online Cost-driven Data Caching Algorithm in the Cloud National R&D Project at CAS

- Design and implement an online cost-driven data caching algorithm in the distributed cloud. Challenges including cost optimisation under online setting. Solved via packable anticipatory caching model construction. The algorithm is feasible for big data applications due to its optimised cost and excellent scalability.
- The algorithm reduces data caching cost by 5-11%. Theoretically, the competitive ratio and its lower bound for the online algorithm is proved.
- **Key skills**: caching optimisation, theoretical analysis, data mining and analytics, Python programming. Published 2 CCF-A papers and 3 patents.

Multi-indexing System based on HDFS for Remote Sensing Data Storage
National R&D Project at CAS, internship at CAS during Nov 2020 - Aug 2021

- Design a multi-indexing remote sensing data storage and analytics system based on HDFS. With low latency, the system benefits geospatial data storage and analytics.
- The multi-indexing mechanism reduces the indexing and querying time by 60%. Besides, the MIX-RS system is immune to data loss and enjoys excellent scalability.
- **Key skills**: big data storage system design, indexing algorithm design and academic writing. Published 1 JCR Q1 paper.

Award

- President Scholarship of CAS, 2023 (**Highest award for PhD in CAS top 0.5%**)
- Pacemaker for Outstanding Student, UCAS, 2023
- Outstanding Student, UCAS, 2023
- Dean's Honours List, Uni of Melbourne, 2019
- Dean's List of Excellence in Academic Performance, University of Sydney, 2017 & 2018

Skills and Language Ability

Programming Skill: Python (PyTorch, Sklearn, etc), Java, SQL.
Technical Skills: Networking, data analytics, statistics, database, operating system, etc.
Language Skills: Passed IELTS Academic (score=7.0), CET-4 (score=665, got full mark in reading), lived and studied in Australia for 5 years, comfortable in English communication environment. Native speaker of Mandarin Chinese.
Writing Skills: Write logically and professionally, have strong capability of academic paper, patent and technical report writing.