Han Yuan

EDUCATION & ACADEMIC TRAINING

Duke-National University of Singapore Medical School, Singapore — Aug. 2020 – Sept. 2024
Ph.D. Degree in Biostatistics and Health Data Science — Advisor: Assoc. Prof. Dr. Nan Liu
Duke University, United States — Jun. – Jul. 2023
Research Scholar, Department of Biostatistics and Bioinformatics — Advisor: Asst. Prof. Dr. Chuan Hong
University of Zurich, Switzerland — Jan. – Jun. 2022
Research Scholar, Department of Quantitative Biomedicine — Advisor: Prof. Dr. Michael Krauthammer
Harvard University, United States — Jul. 2019 – Jan. 2020
Consultant, Departments of Epidemiology and Biostatistics — Advisor: Assoc. Prof. Dr. Molin Wang
Nankai University, China — Sept. 2015 – Jun. 2019
Double B.S. Degrees in Biotechnology and Applied Mathematics — Ranking: 1st/79, GPA: 3.7/4.0

PROFESSIONAL EXPERIENCE & EXTRACURRICULAR ACTIVITIES

American Express Innovation Laboratories, Singapore — May. 2024 – Present
Manager of NLP & GenAI (Full-time) — Oct. 2024 – Present

- Developed a scam detector from customer servicing dialogues with explainable reasoning and evidence.
- Developed a case review generator to streamline credit bust out investigations, identify risk signals, and engineers credit-risk features to upgrade credit decision systems for US consumer market.
- Authored 6 research papers on LLM reasoning, grounded generation, and domain-specific evaluation.
- Mentored summer interns on semi-supervised fine-tuning for LLM for financial analysis.
- Led newsletters, tutorials, and journal club sessions on internal use cases and external technical breakthroughs.

Manager of Data Science (Internship) — May – Aug. 2024

- Developed transformer-based generative AI solutions for users' spending behavior prediction and ensembled it with the existing system to enhance personalization in out-of-sample and out-of-time scenarios.

Medical Informatician (Part-time), Comprehensive Cancer Center Zurich, Zurich — Jan. – Jun. 2022

- Developed several diagnostic models based on multi-modality.

Biostatistician (Part-time), Brigham Health, Boston — Jul. 2019 – Jan. 2020

- Implemented and compared statistical models for longitudinal datasets.
- Debugged algorithm and optimized time and space complexity of R code.

Macro Research Analyst (Internship), Founder Securities, Beijing — Aug. – Sept. 2017

- Conducted macro-economy analysis using records from Bloomberg and the National Bureau of Statistics.
- Finished 5+ macroeconomic research reports and 10+ industry reviews.

Banking Advisor (Internship), Bank of China, Nanjing — Aug. – Sept. 2016

- Processed payments, issued invoices, staff claims, bank transfers, and reconciliations.

President (Part-time), Econ-China Association, Nankai University — Sept. 2016 – Jun. 2017

- Organized 15+ seminars on economics and invited 10+ professors, attracting 80% of club members.
- Connected with alumni and companies to find intern opportunities for association members.

Teaching Volunteer (Part-time), Tianjin Yongji Primary School — Sept. 2015 – Jan. 2016

- Weekly guided 40+ pupils about math knowledge.

SELECTED PUBLICATIONS & SOFTWARE (Google Scholar Citation: 830) — ☯ Equal contribution

17. Yuan, H., … & Ma, Z. (2026). Quantifying the Impact of Structured Output Format on Large Language Models through Causal Inference. Findings of the Association for Computational Linguistics: EACL 2026, Long Paper Track.
16. Yuan, H., … & Ma, Z. (2026). Empowering Small Language Models with Factual Hallucination-Aware Reasoning for Financial Classification. The AAAI Workshop on Trust and Control in Agentic AI, Long Paper Track.
15. Yuan, H., … & Hong, C. (2025). Rethinking Domain-specific Pre-training by Supervised or Self-supervised Learning for Medical Image Classification: A Comparative Study against ImageNet Counterparts in Active Learning. Health Care Science.
14. Wu, Y., Yuan, H.☯, Zhang, L., & Ma, Z. (2025). Natural Language Inference as a Judge: Detecting Factuality and Causality Issues in Language Model Self-Reasoning for Financial Analysis. The EMNLP Workshop on Financial Technology and Natural Language Processing, Long Paper Track.
13. Hu, B., Yuan, H.☯, … & Ma, Z. (2025). Extract, Match, and Score: An Evaluation Paradigm for Long Question-context-answer Triplets in Financial Analysis. The ICLR Workshop on Advances in Financial AI, Long Paper Track.

12. Chen, Y., … Yuan, H., … & Li, I. (2025). GraphCheck: Breaking Long-Term Text Barriers with Extracted Knowledge Graph-Powered Fact-Checking. The Annual Meeting of the Association for Computational Linguistics, Long Paper Track.
11. Yuan, H., … & Li, Y. (2025). Opening the Black Box of Deep Learning: Validating the Statistical Association between Explainable Artificial Intelligence and Clinical Domain Knowledge in Fundus Image-based Glaucoma Diagnosis. Preprint.
10. Yuan, H., … & Liu, N. (2024). Clinical Domain Knowledge-derived Template Improves Post Hoc AI Explanations in Pneumothorax Classification. Journal of Biomedical Informatics.
9. Yuan, H., … & Liu, N. (2024). Leveraging Anatomical Constraints with Uncertainty for Pneumothorax Segmentation. Health Care Science.
8. Yuan, H. (2024). Anatomic Boundary-aware Explanation for Convolutional Neural Networks in Diagnostic Radiology. iRadiology.
7. Liu, P., Yuan, H., … & Peres, M. (2024). A Modified Gower Distance-based Clustering Analysis for Mixed-type Data. BMC Medical Research Methodology.
6. Yuan, H., … & Wu, Y. (2023). An Empirical Study of the Effect of Background Data Size on the Stability of SHAP for Deep Learning Models. The International Conference on Learning Representations, Tiny Paper Track.
5. Yuan, H., ... & Liu, N. (2022). AutoScore-Imbalance: An Interpretable Machine Learning Tool for Development of Clinical Scores with Rare Events Data. Journal of Biomedical Informatics.
4. Zhao, Y., Yuan, H.☯ & Wu, Y. (2021). Prediction of Adverse Drug Reaction using Machine Learning Based on an Imbalanced Electronic Medical Records. The International Conference on Medical and Health Informatics, Full Paper Track.
3. Xie, F., Ning Y., Yuan, H., ... & Liu, N. (2021). Package 'AutoScore': An Interpretable Machine Learning-Based Automatic Clinical Score Generator. R Package.
2. Miao, C., Yu, A., Yuan, H.☯, ... & Wang, Z. (2020). Effect of Enhanced Recovery After Surgery on Postoperative Recovery and Quality of Life in Patients Undergoing Laparoscopic Partial Nephrectomy. Frontiers in Oncology.
1. Zhang, J., Sun, Z., Yuan, H. & Wang, M. (2020). Alternatives to the Kaplan-Meier Estimator of Progression-free Survival. International Journal of Biostatistics.

CONFERENCE & CONTRIBUTED PRESENTATIONS

The Annual AAAI Conference on Artificial Intelligence, Workshop Poster Presentation	2026
The Conference on Empirical Methods in Natural Language Processing, Workshop Oral Presentation	2025
The International Conference on Learning Representations, Workshop Poster Presentation	2025
Health Data Science Symposium, Oral Presentation	2025
AI Health Summit, Poster Presentation	2023
Medical Imaging with Deep Learning Conference, Poster Presentation	2023
The International Conference on Learning Representations, Workshop Poster Presentation	2023
The International Conference on Medical and Health Informatics, Oral Presentation	2021

ACADEMIC SOCIETIES & EDITORIAL SERVICES

❶ JCR Q1

Handling Editor, Frontiers in Public Health❶, Referee, Nature Digital Medicine❶, Nature Artificial Intelligence❶, Nature Health Systems❶, Journal of Big Data❶, Archives of Computational Methods in Engineering❶, Artificial Intelligence Review❶, Engineering Applications of Artificial Intelligence❶, Expert Systems with Applications❶, Genome Medicine❶, BMC Medicine❶, IEEE Journal of Biomedical and Health Informatics❶, Artificial Intelligence in Medicine❶, BMC Medical Research Methodology❶, Journal of Medical Internet Research❶, International Journal of Human-Computer Interaction❶, BioData Mining❶, Scientific Reports❶, Respiratory Research❶, BMC Complementary Medicine and Therapies❶, Frontiers in Digital Health❶, PeerJ Computer Science❶, Discover Artificial Intelligence❶, Insurance: Mathematics and Economics❶, BMJ Innovations, Data Science Journal, Health Care Science, Machine Learning for Healthcare

HONORS & AWARDS

Global Decision Science Star Award in Achievement and Innovation, American Express	2025
The Fifth Year Tuition and Miscellaneous Fees Awards, Duke-NUS Medical School	2024
Pre-Doctoral Research Exchange Awards, Duke-NUS Medical School	2023
The Student Accommodation Awards, International Conference on Learning Representations	2023
The Runner-up of the 7th Annual Ph.D. Student Research Symposium, Duke-NUS Medical School	2022
Khoo Pre-Doctoral Fellowship, Duke-NUS Medical School	2020 & 2021 & 2022 & 2023
Merit Graduates (Top 5% Graduates), Nankai University	2019
The Third Prize of Undergraduate Scientific Research (Top 20% Groups), Tianjin Municipal Education Commission	2018
The First Prize of Excellent Undergraduate Scholarship (Top 5% Students), Nankai University	2016 & 2017
Merit Student (Top 10% Students), Nankai University	2016