Han Yuan

EDUCATION & ACADEMIC TRAINING

National University of Singapore, Singapore — Aug. 2020 – Aug. 2024
Ph.D. Degree in Biostatistics and Health Data Science — Advisor: Dr. Nan Liu
Duke University, United States — Jun. – Jul. 2023
Research Scholar, Department of Biostatistics and Bioinformatics — Advisor: Dr. Chuan Hong
University of Zurich, Switzerland — Jan. – Jun. 2022
Research Scholar, Department of Quantitative Biomedicine — Advisor: Dr. Michael Krauthammer
Harvard University, United States — Jul. 2019 – Jan. 2020
Consultant, Departments of Epidemiology and Biostatistics — Advisor: 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

Data Science Manager (Internship), American Express, Singapore — May – Aug. 2024
- Developed transformer-based solutions from time series modeling to out-of-sample and out-of-time evaluation.
- Integrated the developed solutions with the existing system to enhance the personalized recommendation.

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.

PUBLICATIONS & SOFTWARE (Google Scholar)

☯ Equal contribution

28. Yuan, H., … & Liu, N. (2024). Clinical Domain Knowledge-derived Template Improves Post Hoc AI Explanations in Pneumothorax Classification. Journal of Biomedical Informatics.
27. Yuan, H., … & Liu, N. (2024). Leveraging Anatomical Constraints with Uncertainty for Pneumothorax Segmentation. Health Care Science (In Press).
26. Yuan, H. (2024). Toward Real-world Deployment of Machine Learning for Healthcare: External Validation, Continual Monitoring, and Randomized Clinical Trials. Health Care Science (In Press).
25. Yuan, H., … & Liu, M. (2024). Automated Machine Learning with Interpretation: A Systematic Review of Methodologies and Applications in Healthcare. Medicine Advances (In Press).
24. Yuan, H., … & Fan, Z. (2024). Human-in-the-loop Machine Learning for Healthcare: Current Progress and Future Opportunities in Electronic Health Records. Medicine Advances (In Press).
23. Yuan, H. (2024). Clinical Decision Making: Evolving from Hypothetico-deductive Model to Knowledge-enhanced Machine Learning. Medicine Advances (Under Review).
22. Liu, P., Yuan, H., … & Peres, M. (2024). A Modified Gower Distance-based Clustering Analysis for Mixed-type Data. BMC Medical Research Methodology (Under Review).
21. Li, Y., … Yuan, H., … & Ang, M. (2024). Deep Learning Algorithms to Predict Response and Effect on Adult High Myopia in the Atropine Treatment Long-term Assessment Study. Ophthalmology (Under Review).
20. Li, Y., … Yuan, H., … & Ang, M. (2024). Long-term effect of Childhood Atropine Treatment on Choroidal Thickness using Deep Learning enabled Segmentation – The Atropine Treatment Long-term Assessment Study. Ophthalmology (Under Review).
19. Kang, L., … Yuan, H. & Zhu, C. (2024). Approximate Policy Iteration with Deep Minimax Average Bellman Error Minimization. IEEE Transactions on Neural Networks and Learning Systems.
18. Yuan, H. & Hong, C. (2024). Foundation Model Makes Clustering A Better Initialization for Active Learning. arXiv.
17. Zhu, M., Liu, M., Yuan, H., … & Liu, N. (2024). Clinical Knowledge-integrated AI Towards Gender Fairness in Skin Cancer Diagnosis. arXiv.

16. Yuan, H., … & Zhao, G. (2023). Human-Guided Design to Explain Deep Learning-based Pneumothorax Classifier. Medical Imaging with Deep Learning, Short Paper Track.
15. Yuan, H., … & Wu, Y. (2023). An Empirical Study of the Effect of Background Data Size on the Stability of SHAP for Deep Learning Models. International Conference on Learning Representations, Tiny Paper Track.
14. Yuan, H., … & Xie, F. (2023). Interpretable Machine Learning-Based Risk Scoring with Individual and Ensemble Model Selection for Clinical Decision Making. International Conference on Learning Representations, Tiny Paper Track.
13. Kang, L., Yuan, H. & Zhu C. (2023). Error Analysis of Fitted Q-iteration with ReLU-activated Deep Neural Networks. International Conference on Learning Representations, Tiny Paper Track.
12. Liu, M., Li, S., Yuan, H., ... & Liu, N. (2023). Handling Missing Values in Healthcare Data: A Systematic Review of Deep Learning-based Imputation Techniques. Artificial Intelligence in Medicine.
11. Li, S., ... Yuan, H., ... & Liu, N. (2023). FedScore: A Privacy-preserving Framework for Federated Scoring System Development. Journal of Biomedical Informatics.
10. Xie, F., ... Yuan, H., ... & Liu, N. (2023). A Universal AutoScore Framework to Develop Interpretable Scoring Systems for Predicting Common Types of Clinical Outcomes. STAR Protocols.
9. 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.
8. Xie, F., Ning, Y., Yuan, H., ... & Chakraborty, B. (2022). AutoScore-Survival: Developing Interpretable Machine Learning-based Time-to-event Scores with Right-censored Survival Data. Journal of Biomedical Informatics.
7. Liu, M., Ning, Y., Yuan, H., … & Liu, N. (2022). Balanced Background and Explanation Data are Needed in Explaining Deep Learning Models with SHAP: An Empirical Study on Clinical Decision Making. arXiv.
6. Xie, F., Yuan, H.☯, ... & Liu, N. (2021). Deep Learning for Temporal Data Representation in Electronic Health Records: A Systematic Review of Challenges and Methodologies. Journal of Biomedical Informatics.
5. Zhao, Y., Yuan, H.☯ & Wu, Y. (2021). Prediction of Adverse Drug Reaction using Machine Learning Based on an Imbalanced Electronic Medical Records Dataset. International Conference on Medical and Health Informatics, Full Paper Track.
4. Xie, F., Ning Y., Yuan, H., ... & Liu, N. (2021). Package 'AutoScore': An Interpretable Machine Learning-Based Automatic Clinical Score Generator. R Package.
3. Miao, C., ... Yuan, H., ... & Wang, Z. (2021). TRIM37 Orchestrates Renal Cell Carcinoma Progression via Histone H2A Ubiquitination-dependent Manner. Journal of Experimental & Clinical Cancer Research.
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.

PROFESSIONAL SOCIETIES & EDITORIAL SERVICES

Program Committee Member, International Conference on Image, Video Processing and Artificial Intelligence
Referee, Expert Systems with Applications, Data Science Journal, Machine Learning for Health Symposium

HONORS & AWARDS

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

CERTIFICATES

☼ Specialization: A series of related courses

Data Science Math Skills, Cert., Duke University
Machine Learning, Cert., Duke University
Clinical Decision Making using Deep Learning☼, Cert., University of Glasgow
Mathematics for Machine Learning☼, Cert., Imperial College London
Deep Learning with PyTorch, Cert.1, Cert.2, Cert.3, Cert.4, Cert.5, Coursera Project

EXTRACURRICULAR ACTIVITIES

President, Econ-China Association, Nankai University — Sept. 2016 – Jun. 2017

- Organized 15+ seminars on economics and invited 10+ professors, attracting 80% of club members.
- Maintained interactions with alumni and companies like CICC to find internships for club members.

Teaching Volunteer, Tianjin Yongji Primary School Sept. 2015 – Jan. 2016

- Weekly guided 40+ pupils about math knowledge.