Mingxuan Liu

Center of Computational Quantitative Medicine
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EDUCATION

Duke-NUS Medical School   2022-Present
PhD in Biostatistics & Health Data Science, *Advisor: Nan Liu*
Exchange: Mar 2024-Jul 2024
Boston Children's Hospital, Harvard Medical School, *Advisor: William La Cava*

National University of Singapore   2020-2021
MS in Statistics (4.85/5, top 10%)

Nanjing Univerisity   2016-2020
BSc in Mathematics, *Advisor: Lihong Wang*
Exchange: University of Queensland   Aug 2016 - Dec 2016

RESEARCH AREAS

AI fairness in healthcare, interpretable machine learning, biostatistics, missing value imputation

PUBLICATIONS

2024   **Liu, M.***, Ning, Y.*, Teixayavong, S., Liu, X., Mertens, M., ... and Liu, N.
        Towards Clinical AI Fairness: Filling Gaps in the Puzzle Under review. Preprint available at:
        doi:arxiv.org/abs/2405.17921

2024   **Liu, M.**, Ning, Y., Ke, Y., Shang, Y., Chakraborty, B., Ong, M.E.H., Vaughan, R. and Liu, N.
        Fairness-Aware Interpretable Modeling (FAIM) for Trustworthy Machine Learning in
        Healthcare Under review. Preprint available at: doi:arxiv.org/abs/2403.05235

2023   **Liu, M.***, Ning, Y.*, Teixayavong, S., Mertens, M., Xu, J., ... and Liu, N.
        Towards clinical AI fairness: A translational perspective. ***Npj digital medicine***
        doi:10.1038/s41746-023-00918-4

2023   Xie, F., Ning, Y., **Liu, M.**, Li, S., Saffari, S. E., Yuan, H., Volovici, V., Ting, D. S. W.,
        Goldstein, B. A., Ong, M. E. H., Vaughan, R., Chakraborty, B., and Liu, N.
        A universal AutoScore framework to develop interpretable scoring systems for predicting
        common types of clinical outcomes. ***STAR protocols*** doi:10.1016/j.xpro.2023.102302

2023   **Liu, M.***, Li, S.*, Yuan, H., Ong, M.E.H., Ning, Y., Xie, F., Saffari, S.E., Shang, Y., Volovici, V.,
        Chakraborty, B. and Liu, N.

Handling missing values in healthcare data: A systematic review of deep learning-based imputation techniques. ***Artificial Intelligence in Medicine.*** doi:10.1016/j.artmed.2023.102587

2022   Liu, N., **Liu, M.**, Chen, X., Ning, Y., Lee, J. W., Siddiqui, F. J., Saffari, S. E., Ho, A. F. W., Shin, S. D., Ma, M. H., Tanaka, H., Ong, M. E. H., and PAROS Clinical Research Network Investigators.

Development and validation of an interpretable prehospital return of spontaneous circulation (P-ROSC) score for patients with out-of-hospital cardiac arrest using machine learning: A retrospective study. ***EClinicalMedicine.*** doi:10.1016/j.eclinm.2022.101422

CONFERENCE ABSTRACTS (PEER-REVIEWED)

2024   **Liu, M.**, Ning, Y., Ke, Y., Shang, Y., Chakraborty, B., Ong, M.E.H., Vaughan, R. and Liu, N.
Fairness-Aware Interpretable Modeling (FAIM) for Trustworthy Machine Learning in Healthcare. In ***Symposium on Artificial Intelligence in Learning Health Systems (SAIL)***. [*Poster*]

2024   Zhu, M., **Liu, M.**, Yuan, H. and Liu, N.
Attention-Guided Fair AI Modelling for Skin Cancer Diagnosis. In ***Symposium on Artificial Intelligence in Learning Health Systems (SAIL)***. [*Poster*]

2024   **Liu, M.**, Ning, Y., Ke, Y., Shang, Y., Chakraborty, B., Ong, M.E.H., Vaughan, R. and Liu, N.
Fairness-Aware Interpretable Modeling (FAIM) for Trustworthy Machine Learning in Healthcare. In ***AMIA Informatics Summit***. [*Poster*]

2023   **Liu, M.**, Ning, Y., Yau, C.E., Okada, Y., Li, S., Ho, A.F.W., Shin, S.D., Ma, M.H.M., Tanaka, H., Ong, M.E.H., and Liu, N.
Federated transfer learning for prediction of 30-day survival for out-of-hospital cardiac arrest patients. In ***EMS Asia***. [*Oral*]

AWARDS AND HONORS

- Khoo Pre-Doctoral Fellowship, Duke-NUS Medical School, 2022-2026

- Travel Support Award, Conference on Health, Inference, and Learning (CHIL), 2024

- Travel Support Award, Symposium on Artificial Intelligence in Learning Health Systems (SAIL), 2024

- Undergraduate Research Exchange Awards, Nanjing University, 2019

- The second prize of the Contemporary Undergraduate Mathematical Contest in Modelling, 2018

- Merit Student (Top 10% Students), Nanjing University, 2017

PROFESSIONAL EXPERIENCE

Research Assistant Intern

A*star – Agency for Science, Technology and Research (supervised by Dr. Chin Su), 2021

- Conducted machine learning models (e.g., Random Forest and XGboost) via R and python to predict protein production based on frequency of amino acids, improving the general performance by 12% and writing pipelines to make the procedure efficient.

Data Science Intern

Benshi.ai, 2020-2021

- Analyzed in project about maternal health and dealt with big datasets via Python and Spark through Azure cloud platform, providing efficient data analysis pipeline for modelling.

- Applied survival models via Pysurvival module to predict users' active time for Safe Delivery App and explored users' profiles, generating data insights with team members.

- Managed corporation cross teams with development of Machine Learning models and promote friendly cooperation with Denmark company Maternity Foundation.

CERTIFICATES

- Deep Learning Specialization (5 courses) from Deeplearning.ai and Coursera

- Big Data Fundamentals with Pyspark from DataCamp

- Finding Hidden Messages in DNA (with Honors) from the University of San Diego and Coursera

- Design and Interpretation of Clinical Trials from Johns Hopkins University and Coursera

- Introduction to Healthcare from Stanford University and Coursera

Updated July 2024