

Ling Liao

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Professional Summary

Bioinformatics Ph.D. candidate specializing in **interpretable** machine learning and deep learning for predictive modeling, with applications to complex, multi-source biomedical data.

Expertise: DL (Attention, CNN, Encoder-Decoder) • XGBoost/RF • SHAP • Big Data • Leadership

Skills: Python • Bash • PyTorch • scikit-learn • Scanpy • tidyverse • Docker • Git

Education & Awards

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| 09/2021 – 06/2026(expected) | Washington University School of Medicine , PhD in Bioinformatics
Fellowship: Awarded annually to ~20 students across all graduate programs at Washington University, McDonnell International Scholars Academy (2021–Present) |
| 09/2017 – 06/2020 | Tsinghua University , MS in Biomedical Engineering
<u>Award:</u> Top 5 in the Open FIESTA program, Tsinghua Shenzhen International Graduate School (2018) |
| 09/2013 – 06/2017 | Taiyuan University of Technology , BS in Engineering |

Research Experience

- **Therapeutic Targets:** Developed DL models to predict co-regulated gene expression from histopathology spots, identifying potential targets in breast and lung cancers.
- **Interpretable ML for EHR:** Designed subgroup-aware ML models to identify patient subgroups and generate subgroup-specific risk alerts.
- **ICU Mortality Interpretation:** Benchmarked interpretability and ML methods to identify key clinical predictors.
- **Breast Cancer Diagnosis:** Built reproducible DL pipelines on CBIS-DDSM dataset, enhancing transparency and reproducibility.

Publications

† corresponding author, * co-first author

- [1] **Ling Liao**†, Eva Aagaard†. An MLI-Guided Framework for Subgroup-Aware Modeling in Electronic Health Records (AdaptHetero). (submitted, 2025)
- [2] **Ling Liao**†, Eva Aagaard†. Translating Machine Learning Interpretability into Clinical Insights for ICU Mortality Prediction. (submitted, 2025)
- [3] **Ling Liao**†. Inequality in Breast Cancer: Global Statistics from 2022 to 2050. *The Breast* (2024)
- [4] **Ling Liao**†, Eva Aagaard. An Open Codebase to Enhance Reliability in Deep Learning-Based Breast Cancer Diagnosis. *Sci Rep* (2024)
- [5] Haowen Zhou, ..., **Ling Liao**, et al. Length-Scale Study in Deep Learning Prediction for Non-Small Cell Lung Cancer Brain Metastasis. *Sci Rep* (2024)
- [6] Wei Wang*, **Ling Liao***, et al. An intelligent nanoscale insulin delivery system. *Molecules* (2018)
- [7] Xiaobing Zhang, ..., **Ling Liao**, et al. Effects of mogrosides on high-fat-diet-induced obesity and nonalcoholic fatty liver disease in mice. *Molecules* (2018)
- [8] Chang Hai, ..., **Ling Liao**, et al. Effects of SiCp content on the microstructure and mechanical properties of SiCp/Mg-5Al-2Ca composites. *Rare Metal Materials and Engineering* (2018)