Ling Liao

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Professional Summary

Bioinformatics Ph.D. candidate passionate about **interpretable** machine learning and deep learning for predictive modeling using 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

09/2021 – 06/2026(expected)	**Washington University**, PhD in Bioinformatics
	<u>Fellowship</u>: 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

1. **Spatial Pathway Activity Mapping:** Developed a framework that predicts spatial pathway activity directly from routine H&E histology images to reveal tumor microenvironment heterogeneity.

2. **Interpretable ML for EHR:** Designed subgroup-aware ML models to identify patient subgroups and generate subgroup-specific risk alerts.

3. **ICU Mortality Interpretation:** Benchmarked interpretability and ML methods to identify key clinical predictors.

4. **Breast Cancer Diagnosis:** Built reproducible DL pipelines on the 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). (under revision, 2025)

[2] **Ling Liao†,** Eva Aagaard†. Translating Machine Learning Interpretability into Clinical Insights for ICU Mortality Prediction. (submitted, 2025)

[3] **Ling Liao*,** Somnath Paul*, H Michael Isaacs, Richard J Cote†. AI and the digital pathology revolution: Clinical applications in cancer diagnosis and assessment. (submitted, 2025)

[4] **Ling Liao†.** Inequality in Breast Cancer: Global Statistics from 2022 to 2050. *The Breast* (2024)

[5] **Ling Liao†,** Eva Aagaard. An Open Codebase to Enhance Reliability in Deep Learning-Based Breast Cancer Diagnosis. *Sci Rep* (2024)

[6] Haowen Zhou, ..., **Ling Liao**, et al. Length-Scale Study in Deep Learning Prediction for Non-Small Cell Lung Cancer Brain Metastasis. *Sci Rep* (2024)

[7] Wei Wang*, **Ling Liao***, et al. An intelligent nanoscale insulin delivery system. *Molecules* (2018)

[8] Xiaobing Zhang, ..., **Ling Liao**, et al. Effects of mogrosides on high-fat-diet-induced obesity and nonalcoholic fatty liver disease in mice. *Molecules* (2018)

[9] 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)