# Ling Liao

lingliao@wustl.edu (314) 857-3933 Homepage LinkedIn GitHub

## 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 |
| | 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 |
| | Award: 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†.** 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)