

# Lingchao (Ling) Mao

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Highly-motivated Ph.D. student with 4+ years of research experience in **applied machine learning**, internship experiences at Meta and retail/fintech companies, passionate about creating innovative ML/AI solutions.

## EDUCATION

<b>Ph.D. Machine Learning, M.S. Computer Science</b> <i>Georgia Institute of Technology, GPA 3.85/4.00, Stewart Fellow, Advisor: Jing Li</i>	2025
<b>B.S. Statistics, B.S. Industrial and Systems Engineering</b> <i>North Carolina State University, GPA 4.00/4.00, Caldwell Fellow, Edward Fitts. Scholar</i>	2020

## INDUSTRY/RESEARCH EXPERIENCE

<b>Meta</b> <i>Machine Learning Software Engineer Intern; Menlo Park, CA</i>	May - Aug 2024
<ul style="list-style-type: none"><li>Implemented <b>self-supervised learning</b> techniques to improve the robustness of ranking models of Facebook Marketplace Feed <b>recommendation system</b>, improving CTR prediction for cold-start users by 0.30%.</li><li>Mitigated significant computational costs added due to data augmentation through QPS optimization studies.</li></ul>	
<b>Georgia Institute of Technology</b> <i>Research Assistant; Atlanta, GA</i>	Jan 2021 – present
<ul style="list-style-type: none"><li>Developed novel methods for <b>machine learning with limited supervision</b>, involving self-supervised learning, weakly-supervised learning, and knowledge injection, solving healthcare prediction and segmentation problems.</li><li>Developed two novel models for <b>multimodal learning</b> from incomplete imaging, genetics, and clinical data, involving approaches in matrix factorization, knowledge-distillation, and vision-language pretraining.</li><li>Published 5 first-authored papers at IEEE, JMIR, INFORMS journals and 6 more under preparation/review.</li><li>Delivered 15 conference talks winning 2 <b>Best Student Paper/finalist awards</b> at IISE/INFORMS conferences.</li><li>Enabled interdisciplinary collaborations with clinicians, biomedical and public health researchers.</li></ul>	
<b>Hafele America Co.</b> <i>Industrial Engineer Co-op; Archdale, NC</i>	Aug – Dec 2018 and Aug – Dec 2019
<ul style="list-style-type: none"><li>Created interactive reports to reveal inefficiencies in warehouse stock, including one used daily by 3 warehouses.</li><li>Streamlined data pipelines through SQL and VBA scripts, saving 15h+/week of data cleaning/preprocessing.</li></ul>	

## SELECTED PROJECTS

<b>🔗 Mendel, a LLM Assistant for Bioinformatics Data Analysis</b> <i>LLM, Langchain, Chainlit</i>	
<ul style="list-style-type: none"><li>A LLM multi-agent chatbot for automated plan and code generation for single-cell data analysis.</li></ul>	
<b>🔗 MedAssist-Liver: Automated Liver Tumor Segmentation</b> <i>LLM, PyTorch</i>	
<ul style="list-style-type: none"><li>Automated liver and tumor segmentation from CT scans via a customized deep learning model (3D SegResNet with knowledge injection) and automated diagnosis report generation using LLM (Llama2).</li></ul>	
<b>🔗 MMTrip, Your Personalized Multi-modal Routing Planner</b> <i>React, Django, Python</i>	
<ul style="list-style-type: none"><li>A Google Map-like multimodal trip planning app featured with in-page flight selection linked with ground transportation planning, trip personalization, AI-forecasted trip costs, and points of interest.</li><li><i>Winner, IISE DAIS Mobile/Web App Competition in Montreal, Canada, 2024</i></li></ul>	

## TECHNICAL SKILLS

<b>Skills</b>	Computer Vision, Machine Learning, Deep Learning, Personalized Recommender Systems, LLM
<b>Languages</b>	Python, R, SQL, SAS (Advanced Programmer), Visual Basic, Java
<b>Frameworks</b>	PyTorch, Langchain, Spark, Docker, AWS
<b>Interests</b>	I play enjoyable-level piano, host a Chinese-Spanish podcast, and have a lovely tuxedo cat

## SELECTED PUBLICATIONS (GOOGLE SCHOLAR LINK)

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1. Supervised multi-modal fission learning.  
**Mao L**, Wang Q, Su Y, Lure F, Li J.  
*INFORMS Journal of Data Science (under review)*.
2. Knowledge-informed machine learning for cancer prognosis and predictions: a review.  
**Mao L\***, Wang H\*, Hu L, Tran N, Canoll P, Swanson K, Li J.  
*IEEE Transactions on Automation Science and Engineering (under review)*.
3. Cross-modal mutual knowledge distillation framework for Alzheimer's Disease  
Kwak M, **Mao L**, Su Y, Chen K, Weidman D, Wu T, Lure F, Li J.  
*IEEE Transactions on Automation Science and Engineering (under review)*.
4. A Holistic Weakly Supervised Approach for Liver Tumor Segmentation.  
Wang H\*, **Mao L\***, Zhang Z, Li J  
*IISE Transactions on Healthcare Systems Engineering (under review)*.
5. Weakly supervised transfer learning with application in precision medicine.  
**Mao L**, Wang L, Hu L, Eschbacher J, Leon GD, Singleton K, Curtin W, Urcuyo A, et al.  
*IEEE Transactions on Automation Science and Engineering (Best Student Paper) (link)*
6. Questionnaire and structural imaging data accurately predict headache improvement in patients with acute post-traumatic headache attributed to mild traumatic brain injury.  
**Mao L**, Li J, Schwedt TJ, Berisha V, Nikjou D, Wu T, Dumkrieger G, Ross K, Chong CD.  
*Cephalalgia. (link)*
7. A 4D theoretical framework for measuring topic-specific influence on Twitter: development and usability study on dietary sodium tweets  
**Mao L**, Chu E, Gu J, Hu T, Weyner B, Su Y.  
*Journal of Medical Internet Research. 2023. (link)*
8. Personalized predictions for urinary tract infection hospitalizations with hierarchical clustering.  
**Mao L**, Vahdat K, Shashaani S, Swann J.  
*INFORMS International Conference on Service Science (Finalist of Best Student Paper)(link)*

## SERVICE

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<b>Reviewer</b> , IEEE-TASE, INFORMS JoC, ICLR, BMC Medical Informatics and Decision Making	
<b>President</b> , INFORMS Student Chapter at Georgia Tech ( <i>Summa Cum Laude Award</i> )	present
<b>Editor</b> , INFORMS ORMS Tomorrow Magazine	present

## SELECTED AWARDS

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<b>George F. Fellowship, William G. Fellowship, Stewart Fellowship</b> , Georgia Tech	2022-2024
<b>Winner</b> , Data Analytics Competition, IISE DAIS	2024
<b>Winner</b> , Mobile/Web App Competition, IISE DAIS	2024
<b>Best Student Paper</b> , IISE Annual Conference, Data Analytics and Information Systems	2022
<b>Best Poster Runners Up</b> , Quality and Productivity Research Conference	2021
<b>Best Student Paper Finalist</b> , INFORMS Conference of Service Science	2020
<b>1st Place</b> , Diamond Hacks @ NC State University, Women in Computer Science	2019
<b>1st Place</b> , Deloitte Startup Innovation Competition @ NC State University	2019