Tianhe (Rory) Wu

B.S. in Applied Mathematics | B.A. in Biology
GPA: 3.99/4.00
Emory University
Atlanta, GA

4703895279
rory.wu@emory.edu
rory.t.wu@gmail.com
LinkedIn Profile
Personal Website

Education

•Emory University *Expected: May 2025*

B.S. in Applied Mathematics | B.A. in Biology Dean's List, Phi Eta Sigma, GPA: 3.9/4.0

– **Relevant Courses:** Data Strcture and Algorism, Mathematical Stats, Organic Chemistry, Neurology, Cancer Biology, Nonlinear Optimization, PDE, Numerical Analysis, Linear Algebra, Multi-variable Calculus, Real Analysis

Conference & Symposium

– **[Under Review]**
  * Tang, L., Gu, Q., **Wu, T.**, ... & Mao, H. **"Investigating Prognostic Value of Dynamic Susceptibility Contrast Perfusion MRI-Derived Features for Glioblastoma Survival by Deep Learning."** Abstract at *International Society for Magnetic Resonance in Medicine (ISMRM)*
  * Tang, L., Gu, Q., **Wu, T.**, ... & Mao, H. **"Altered Cerebrospinal Fluid Dynamics in Alzheimer's Disease."** Abstract at *International Society for Magnetic Resonance in Medicine (ISMRM)*
– **[Presented Work]**
  * Tang, L., **Wu, T.**, & Mao, H. **"Hemodynamic Property Incorporated Brain Tumor Segmentation by Deep Learning and Density-Based Analysis of Dynamic Susceptibility Contrast-Enhanced MRI."**; Poster at *World Molecular Imaging Congress 2023*; 2023 Sep 6; Prague, Czech Republic.
  * Martin E, Valavala N, **Wu, T.**, Asante R, Taliaferro-Smith L. **"The Impact of c-Jun Initiated Tap63 Upregulation on TNBC Metastasis."**; Poster at *2023 Oxford College Research Scholar Symposium*; 2023 Apr 14; Oxford, GA.

Publications

– **[Published Work]**
  * Li, Y., Mozhi, A., Ma, H., Padelford, J., Zhang, Z., **Wu, T.**, Gu, Q., Wang, Z., & Mao, H. **"A subtype specific probe for targeted magnetic resonance imaging of M2 tumor-associated macrophages in brain tumors."** *Acta Biomaterialia.*
  * Tang, L., **Wu, T.**, Hu, R., Gu, Q., Yang, X., & Mao, H. (2024). **"Hemodynamic Property Incorporated Brain Tumor Segmentation by Deep Learning and Density-Based Analysis of Dynamic Susceptibility Contrast-Enhanced MRI."** *Quantitative Imaging in Medicine and Surgery.*
  * **Wu, T.**, Liu, C., Thamizhchelvan, A. M., Fleischer, C., Peng, X., Liu, G., & Mao, H. (2023). **"Label-Free Chemically and Molecularly Selective Magnetic Resonance Imaging."** *Chemical & Biomedical Imaging.*
  * Thamizhchelvan, A. M., Ma, H., **Wu, T.**, Nguyen, D., Padelford, J., Whitworth, T. J., Li, Y., Yang, L., & Mao, H. (2024). **"Shape-Dependent Cell Uptake of Iron Oxide Nanorods: Mechanisms of Endocytosis and Implications on Cell Labeling and Cellular Delivery."** *Nanoscale.*
  * Yao, L., & **Wu, T.** (2024). **"Application and Regulatory Challenges of Artificial Intelligence/Machine Learning in Clinical Trials from the Perspectives of FDA Discussion, EMA Reflection Paper, and the Stakeholders' Comments."** *China Food & Drug Administration Magazine.*
  * Wu, J., **Wu, T.**, & Yao, L. (2024). **"A Brief Analysis of Regulatory Sandboxes for Disruptive Innovation in Pharmaceutical Products."** *China Food & Drug Administration Magazine.*

Research Experience

•Winship Cancer Institute, Emory Medical School *Jun 2022 – Present*

Research Assistant; Supervised by Dr.Hui Mao Atlanta, GA

– Developed novel U-Net/HDBScan model to incorporate hemodynamic properties into brain tumor segmentation using dynamic susceptibility contrast-enhanced MRI
– Enhanced glioblastoma prognosis by integrating DSC perfusion MRI hemodynamic features with HDBNet for feature extraction and XGBoost for prediction, achieving 0.697 ROC-AUC accuracy for 10 month survival outcomes
– Utilized resting-state fMRI to identify altered cerebrospinal fluid dynamics as potential biomarkers for early Alzheimer's and mild cognitive impairment

– Explored SwinIR based methods for 7T MRI Image Super-Resolution
– Developed Learning Based Confocal Signal Identification Algorism, Python-based
– Investigated shape-dependent cellular uptake of iron oxide nanorods (IONR) with different aspect ratios, revealing that larger IONRs exhibited higher uptake in macrophages and cancer cells via distinct endocytosis pathways.
– Participated in the development of an MRI probe using sub-5 nm ultrafine iron oxide nanoparticles (uIONP) with M2-specific peptides (M2pep) to target pro-tumoral M2 tumor-associated macrophages (TAM) in glioblastoma, achieving 88.7-fold higher tumor accumulation and superior MRI contrast compared to Ferumoxytol, enabling non-invasive imaging of TIME changes.

•Department of Biomedical Informatics, Emory Medical School *Jan 2024 - Present*
Student Researcher; Supervised by Dr. Hyeokhyen Kwon Atlanta, GA

– Exploring GenAI-based methods for movement disorder analysis including GAN-based and diffusion-based methods
– Developing unsupervised diffusion-transformer model, using motion reconstruction as a pre-training task to extract latent representations for downstream movement disorder analysis with limited disease labels
– Redesigned the VAE and positional encoding structure in diffusion transformer, enabling adaptive window sizes on the temporal dimension to handle diverse motion patterns.
– Validated the model through linear probing, demonstrating comparable performance in predicting medication status and FOG scores against supervised DeepCONV-LSTM baselines.

•South Medical Economics Institute, National Medical Products Administration (NMPA) *April 2023 - Aug 2024*
Volunteering student: Supervised by Mr. Lixin Yao Remote, Hybrid

– Investigated integration of ML/AI and PET-related innovations into clinical practice under regulatory frameworks, with a focus on accessibility for underserved communities.
– Explored pathways for national insurance coverage of PET-CT cancer diagnostics, contributing to pilot reimbursement programs in four provinces.
– Developed policy recommendations to reduce systemic healthcare inequities, emphasizing patient-centered care and affordability.

•Biology Department of Oxford College, Emory University *Aug 2022 - May 2023*
Student Researcher; Supervised by Dr.Latonia Taliaferro-Smith Oxford, GA

– Investigated the effect of Tap63a upregulation through c-Jun in Triple Negative Breast Cancer

•Tsinghua University & Bluepha *Nov 2018 – Dec 2019*
Captain of IGEM Team BESA-China Beijing, China

– Co-led a team of fifteen to design NEZHA, a noncanonical amino acid controlled, extraordinarily sensitive, modularized, heavy metal sensor, and absorber

Leadership Experience

•Emory International Pre-health Organization *May 2022 - Present*
Co-President of 2024 | Chair of Academic Development 2023 | Member of Oxford Committee 2022

– Spearheading the coordination and integration of 7 distinct departments and committees
– Leading a dynamic team of 30+ members distributed across two campuses
– Curated and refined over 50 weekly newsletters, engaging an audience of 350 subscribers
– Conceptualized and executed 5 professional career panels, featuring 20 Academic/Industry experts

•International Student Advocacy Board *August 2021 – Sep 2022*
Representative

– Gathered opinions from the international student body and provided feedback to the International Students' Office
– Coordinated summer housing availability for incoming international students
– Coordinated 2 faculty-student panel

Technical Skills

Languages: Native in Mandarin, Proficient in English, Beginner in Latin
Developer Tools: Python, Rust, C++, Bash, Linux, Java, MATLAB, R, FSL
Experimental Tools: MRI, Confocal Microscopy, Flow Cytometry, Cell Culture, PCR, Western Blot