Leonardo Tang

Research Specialist

leonardodtang.github.io
linkedin.com/in/leonardodtang
https://scholar.google.com/citations?user=L4bN5vYAAAAJ

Phone: (678) 708-5220
Email: leonardo.tang@emory.edu

Researcher specializing in deep learning architectures for medical imaging data. My work focuses on adapting state-of-the-art computer vision techniques to solve complex real world problems in medical imaging. Ongoing research includes leveraging feature modulation and custom loss functions with frequency priors to enhance diffusion probabilistic models for MR spectroscopy denoising, as well as designing robust pipelines for multi-modal prostate cancer analysis. I am seeking a PhD to research balancing emergence abilities with domain-specific priors in vision models; specifically, I aim to explore how explicit inductive biases can be introduced to guide models toward physically adherent latent representations

EDUCATION

Graduated: May 2022

Master of Science in Computer Science (Machine Learning Specialization)   **GPA: 4.0**

Georgia Institute of Technology, Atlanta, GA

Relevant Coursework: Machine Learning, Machine Learning Theory, Computer Vision, Machine Learning for Biology, Graduate Algorithms, Data Visualization & Analytics, Network Security, Networking & Multimedia, Mobile & Ubiquitous Computing

Graduated: May 2021

Bachelor of Science in Electrical Engineering and Computer Sciences   **GPA: 3.729**

University of California, Berkeley, Berkeley, CA

Relevant Coursework: Data Structures/Algorithms, Functional Programming, Information Devices/Systems, Efficient Algorithms, Artificial Intelligence, Computer Architecture, Computer Security, Computer Graphics, Machine Learning, Signals/Systems, Operating Systems, Databases, Parallel Programming, Neural Networks, Digital Signal Processing. Math Courses: Linear Algebra, Discrete Math/Probability, Number Theory/Cryptography, Multivariable Calculus, Probability/Random Processes, Optimization Models.

RESEARCH EXPERIENCE

January 2023 – Present

Research Specialist

Emory University Department of Radiology and Imaging Sciences, Atlanta, GA

- Developed and implemented deep learning architecture based on a U-Net backbone and unsupervised learning techniques for brain tumor segmentation, incorporating hemodynamic properties derived from dynamic susceptibility contrast-enhanced magnetic resonance imaging.
- Investigated the glymphatic system in Alzheimer's patients by exploring the relationship between cortical regions and cerebrospinal fluid dynamics using resting-state functional MRI
- Developed and implemented algorithm for the calculation and visualization of T2 multi-echo time and T1 multi-inversion time imaging data, enabling quantitative analysis of tissue properties
- Explored the efficacy of state-of-the-art super-resolution models (including Swin2SR and HAT-L) to upscale 3T MRI to 7T MRI.
- Developed a Python-based processing pipeline utilizing segmentation algorithms, subtraction imaging, and accelerated co-registration to process multi-modal MRI data and investigate the efficacy of low-dose targeted prostate-specific membrane antigen contrast agents.
- Explored diffusion models for MR spectroscopy denoising, leveraging a custom frequency-prior loss function and FiLM layers to minimize spectral artifacts and improve metabolite quantification in relevant frequency ranges

RESEARCH EXPERIENCE (cont.)

July 2021– August 2021	**Researcher**
	Emory University Department of Radiology and Imaging Sciences, Atlanta, GA

- Interrogated perfusion MRI data, notably in the temporal dimension, to segment brain tumors through use of deep learning methods including LSTMs, VAEs, and loss gradients

January 2020 - May 2021	**Student Researcher**
	University of California, Berkeley, Berkeley, CA

- Worked on the RadViz team for ISAACS (Immersive Semi-Autonomous Aerial Command System), a project under the direction of Dr. Allen Yang focused on the intersection of AR tech and aerial drones.
- Developed a pipeline to live-stream radiation data and server architecture for multi-drone support, enabling real-time data visualization and analysis for collaborative drone operations.

PUBLICATIONS

- **Tang L**, Wu T, Hu R, Gu Q, Yang X, Mao H. *Hemodynamic property incorporated brain tumor segmentation by deep learning and density-based analysis of dynamic susceptibility contrast-enhanced magnetic resonance imaging (MRI)*. Quant Imaging Med Surg. 2024 Apr 3;14(4):2774-2787. doi: 10.21037/qims-23-1471. Epub 2024 Mar 28. PMID: 38617153; PMCID: PMC11007532.
- Dong X, Lei Y, Wang T, Thomas M, **Tang L**, Curran WJ, Liu T, Yang X. *Automatic multiorgan segmentation in thorax CT images using U-net-GAN*. Med Phys. 2019 May;46(5):2157-2168. doi: 10.1002/mp.13458. Epub 2019 Mar 22. PMID: 30810231; PMCID: PMC6510589.

ABSTRACTS & PRESENTATIONS

- Wheeler A, **Tang L**, Gu Q, Shishido Y, Mao H, Gombolay G, Goldman-Yassen A. (2026, January 16-18). *Glymphatic dysfunction in pediatric-onset multiple sclerosis and anti-myelin oligodendrocyte glycoprotein antibody associated disorder* [Accepted, Scientific Poster]. 2026 ASPNR 8th Annual Scientific Meeting, Tampa, FL, United States.
- **Tang L**, Gu Q, Wu T, Goldman-Yassen A, Mao H (2025, May 10-15). *Investigating prognostic value of dynamic susceptibility contrast perfusion MRI-derived features for glioblastoma survival by deep learning* [Digital Poster]. 2025 ISMRM & ISMRT Annual Meeting and Exhibition, Honolulu, HI, United States. https://archive.ismrm.org/2025/4292.html
- **Tang L**, Gu Q, Wu T, Mao H (2025, May 10-15). *Altered cerebrospinal fluid dynamics in Alzheimer's disease as measured by resting-state fMRI* [Digital Poster]. 2025 ISMRM & ISMRT Annual Meeting and Exhibition, Honolulu, HI, United States. https://archive.ismrm.org/2025/2995.html
- Gu Q, **Tang L**, Vafaie N, Gong C, Kragel P, Bai J, Mao H (2025, May 10-15). *Impairments in functional connectivity and glymphatic system in breast cancer patients undergoing treatment* [Digital Poster]. 2025 ISMRM & ISMRT Annual Meeting and Exhibition, Honolulu, HI, United States. https://archive.ismrm.org/2025/2387.html
- **Tang L**, Hajibonabi F, Reddy K, Gu Q, Mao H (2024, December 1-5). *Revealing hemodynamic heterogeneity in glioblastoma and medulloblastoma by deep-analysis of dynamic susceptibility contrast-enhanced MRI data* [Oral Presentation]. RSNA 2024 Scientific Assembly and Annual Meeting, Chicago, IL, United States. https://www.rsna.org/-/media/files/rsna/annual-meeting/future-and-past-meetings/rsna-2024-meeting-program.pdf
- **Tang L**, Wu T, Mao H (2023, September 5-9). *Improving glioblastoma segmentation with deep learning and hemodynamic Information from dynamic susceptibility contrast-enhanced MRI* [Poster Session]. WMIC 2023, Prague, Czech Republic. https://www.xcdsystem.com/wmis/program/K0ssSya/index.cfm?pgid=2836&sid=26427&abid=101798

IN PROGRESS

- **Tang L**, Gu Q, Wu T, Yang B, Lah J, Levey A, Mao H. *Influence of cortical thickness changes on the cerebral spinal fluid flow in individuals with Alzheimer's disease* [Under Review, Manuscript].
- **Tang L**, Gu Q, Gong C, Vafaie N, Wu T, Kragel P, Bai J, Mao H. *Structural and functional alterations in sensory motor networks in breast cancer patients undergoing treatments* [Submitted as Conference Abstract, Manuscript In Preparation].
- **Tang L**, Goldman-Yassen A, Gombolay G, Wheeler A, Shishido Y, Damaraju E, Palasis S, Mao H. *Distinct Patterns of White Matter Microstructural Damage in MOGAD and MS Revealed by Tract-Based Spatial Statistics* [Submitted, Conference Abstract].

PROFESSIONAL EXPERIENCE

April 2022 - June 2022   **Research Lead / Smart Contract Developer**

Vertex Protocol

- Led development of automated market maker optimizations on a decentralized limit order book exchange on L1 blockchain
- Designed and implemented dynamic adjustment strategies, cutting slippage costs by 85% on average according to market volatility.
- Raised 8.5mm from investors including Dexterity Capital, Jane Street, and Hudson River Trading.

June 2019 - August 2019   **Technical Intern**

AT&T Foundry, Atlanta, GA

- Collected performance metrics using a customized version of ALVR, an open source remote VR display, for 5G vs LTE and WiFi. Stress tested for 5G using high demand compute intensive edge processing applications.
- Developed a Magic Leap application in augmented reality (AR) space for 3D video conferencing, enhanced user experience in Unity application environment.
- Investigated compression methods for Holocapture video streams and decompressed on Magic Leap mpk.

June 2018 - August 2018   **Software Engineering Intern**

Gyrfalcon Technology Inc, Milpitas, CA

- Collaborated with senior engineers to implement a traffic light detection network for a client.
- Implemented a modified Faster-RCNN network for a custom dataset, and experimented with hyperparameter tuning.
- Wrote python scripts for data augmentation, preprocessing, and dataset conversion between XML, JSON, CSV formats

SERVICE

Reviewer for: IEEE Transactions on Biomedical Engineering

SKILLS

Programming Languages: Python, C++, Java, C#, C

Libraries & Frameworks: PyTorch, TensorFlow, Keras, FSL, FreeSurfer, SimpleITK, SciKit-Learn, Slicer, NumPy, Bash, Pandas