Tianqing Li

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I am a BME PhD Candidate at Duke University, developing computational methods for behavioral and neural data analysis. My research integrates computer vision and machine learning to acquire high-resolution motion kinematics and extract interpretable features for phenotype characterization and mechanism discovery.

EDUCATION

Aug 2021-Present **Duke University (Advisor: Timothy W. Dunn)** **Durham, NC**
Ph.D. Candidate in Biomedical Engineering (Expected graduation: May 2026. GPA: 4.00/4.00)

Dec 2020 **University of California, Los Angeles** **Los Angeles, CA**
B.S. in Applied Mathematics, B.S. Bioengineering (Summa Cum Laude, Dean's List, GPA: 3.94/4.00)

TECHNICAL SKILLS

Programming: Python, C++, MATLAB
Tools: PyTorch, Tensorflow (Keras), AWS, OpenCV, Git, Pandas, Scipy, Sklearn
Machine Learning: Multimodal & self-supervised representation learning for time series data | Computer vision for pose estimation and object segmentation | Dimension reduction

JOURNAL PUBLICATIONS

2023 **Mapping the Landscape of Social Behavior**
Klibaite U*, Li T*, Aldarondo D, Akoad JF, Olveczky BP, Dunn TW. Under review at *Cell*.

2023 **Improved Markerless 3D Animal Pose Estimation Using Temporal Semi-Supervision**
Li T, Severson KS, Wang F, Dunn TW. *International Journal of Computer Vision*.
Jointly appeared at CVPR *CV4Animals Workshop 2022* as poster.

2022 **Leaving Flatland: Advances in 3D Behavioral Measurement**
Marshall JD, Li T, Wu JH, Dunn TW. *Current Opinion in Neurobiology*.

CONFERENCE PROCEEDINGS

2024 **Encoding of full-body kinematics and actions in sensorimotor cortex of freely behaving mice**
Severson KS, Lu J, Li T, Lou T, Xiao W, Jiang H, Caplan KA, Dunn TW, Wang F. *Society for Neuroscience*

2024 **Vector Quantized Representations for Efficient Hierarchical Delineation of Behavioral Repertoires**
Li T, Klibaite U, Akoad J, Wu JH, Dunn TW. *Computational and Systems Neuroscience (Cosyne)*.

2023 **Quantitative Profiling of Social Behavior Using 3D Pose Estimation and Multi-Scale Classification**
Klibaite U*, Li T*, Aldarondo D, Akoad JF, Zmarz P, Olveczky BP, Dunn TW. *McKnight Foundation Annual Meeting*.

2023 **Capturing the Social Spectrum in ASD Rats**
Klibaite U, Li T, Aldarondo D, Dunn TW, Olveczky BP. *Bulletin of the American Physical Society.*

2021 **A Multi-Pronged Evaluation for Image Normalization Techniques**
Li T, Wei L, Hsu W. *International Symposium on Biomedical Imaging (ISBI)*.

PROFESSIONAL EXPERIENCES

May-Aug 2024 **Research Scientist Intern, Meta Reality Labs (CTRL-labs)** **New York, NY**
- Built contrastive multimodal representation learning models (CLIP) on electromyography (EMG) time series data, improving data efficiency in a production environment.

Aug 2021-Present **Doctoral Thesis Research, t.Dunn Lab, Duke University** **Durham, NC**
- Develop open-sourced computer vision toolboxes for 3D pose estimation and markerless tracking of laboratory animals, accelerating quantitative studies for alternations of social behaviors in autism [Code].
- Build unsupervised representation learning models for disentangling interpretable features from 3D kinematics time series [Code].
- Build cross-modality seq2seq models that correlate and integrate behavioral kinematics with neural activities.

Apr 2020-Apr 2021 **Research Assistant, Hsu Lab, UCLA Medical & Imaging Informatics** **Los Angeles, CA**
- Investigated 3D generative models for image quality enhancement of low-dose lung CT scans. Analyzed its impact on diagnostic features and downstream malignancy classification.
- Developed semi-/self-supervised deep learning models for breast mass detection and classification in ultrasound scans [Code, Code].

Sep 2018-Sep 2019 **Student Researcher, HHMI Undergraduate Research for Translational Biophotonics** **Los Angeles, CA**
- Implemented algorithms for image processing, calibration and registration in developing fluorescent microscopy for biological samples using MATLAB. Presented at HHMI Undergraduate Conference, UCLA, 2019.

TEACHING

2022, 2023 **Teaching Assistant** **Durham, NC**
BME 590: Introduction to Biomedical Data Science

PRESENTATIONS

2023 **Harvard Neurolunch** **Cambridge, MA**
"High-Resolution 3D Tracking of Freely Interacting Animals for Multi-Scale Classification of Social Behavior"

AWARDS

2022-2023 Robert Plonsey Fellowship **Durham, NC**
2022, 2024 Duke Conference Travel award **Durham, NC**