About Me



NAME

Ting Xiao

TITLE

Associate Professor

YEARS AT UNT

7

RESEARCH FOCUS AREAS

- Artificial Intelligence and Machine Learning
- Representation Learning and Vector Embeddings
- Multimodal AI and Large Language Models
- Graph Neural Networks and Deep Learning
- AI for Healthcare, Environmental, and Social Sciences

Knowledge Beyond Language with Vector Embeddings

Overview:

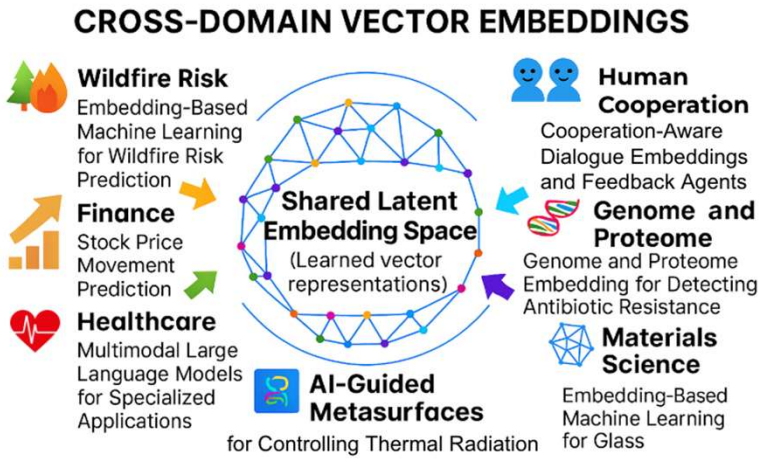
Vector embeddings transform text, images, and other data into numerical representations that capture meaningful relationships and similarities.

Research Focus:

- Develop vector embeddings that capture meaningful relationships across diverse data types.
- Evaluate and improve embedding quality, generalization, and reusability.
- Facilitate knowledge transfer and reuse of learned representations across AI tasks and domains.

Selected Research Projects:

- **Stock2Vec:** Learning Company Similarities from Stock Data
- **Resume2Vec:** Resume Analysis and Job Matching
- **Census2Vec:** Socioeconomic Data Representation and Prediction
- **Healthcare:** Autoencoder-Based Clinical and Behavioral Assessment



NSF-Funded REU Programs:

- 2023-2027: #2244259 (PI, $423,547)
- 2026-2029: #2548192 (PI, $464,978)
- 10 undergraduate students annually in a 10-week summer research experience.
- To date, 32 undergraduate students trained and 25 peer-reviewed publications.

AI for Healthcare: From Clinical Assessment to Multimodal Agents

Overview:

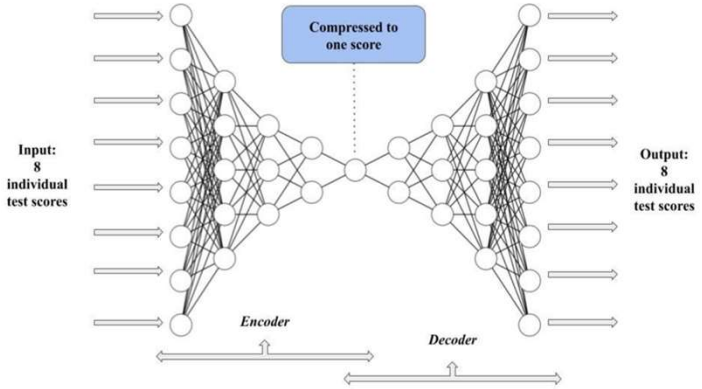
Develop AI methods to extract meaningful information from complex healthcare data and support clinical assessment, interpretation, and decision-making.

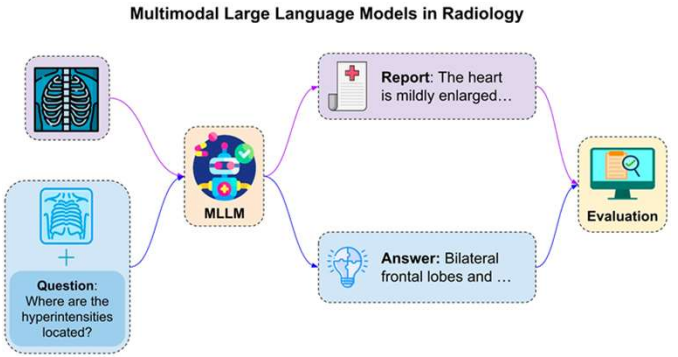
Research Focus:

- Develop autoencoder-based representations and composite metrics for clinical assessment.
- Identify potential disease biomarkers through behavioral and physiological data analysis.
- Develop multimodal AI models and agents for medical image understanding and clinical decision support.

Selected Research Projects:

- **Prosthetic Performance Assessment:** Autoencoder-based composite scoring of clinical outcomes.
- **Parkinson's Disease:** Social engagement analysis and pupil-tracking-based identification of potential biomarkers.
- **Multimodal AI for Radiology:** Automated radiology report generation and visual question answering.





AI for Environmental and Socioeconomic Modeling

Overview:

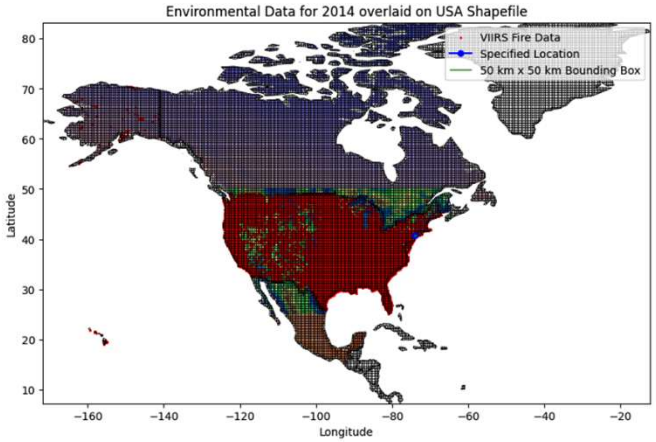
Apply AI and machine learning to uncover patterns and improve environmental and socioeconomic predictions.

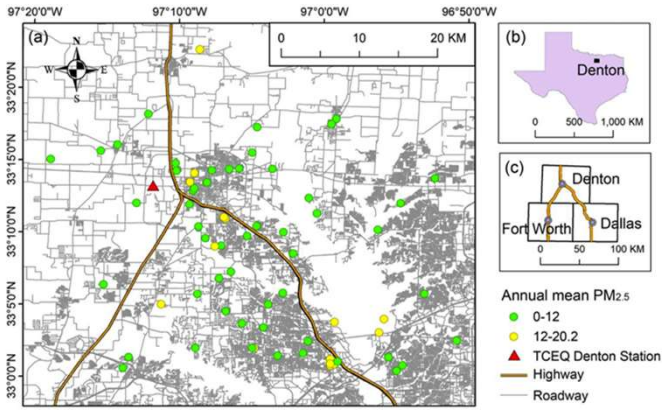
Research Focus:

- Develop machine learning models for environmental and socioeconomic prediction.
- Integrate spatial, temporal, and relational information from heterogeneous data sources.
- Explore graph-based learning and other advanced AI methods to capture complex data relationships.

Selected Research Projects:

- **Wildfire Prediction:** Deep Learning for wildfire risk assessment and prediction.
- **Air Quality Modeling:** Machine Learning for PM2.5 concentration estimation and prediction.
- **Socioeconomic Prediction:** Graph neural networks and hybrid models for predicting socioeconomic indicators.





Current Research Directions and Collaboration Opportunities

Current Research Directions:

- Develop reusable and transferable AI representations across different domains.
- Explore interpretable and trustworthy AI methods.
- Advance multimodal learning and AI agents for complex data analysis.

Potential Collaboration Opportunities:

- **Interdisciplinary AI Research:** Explore applications of AI and machine learning across diverse research domains.
- **Collaborative Grant Proposals:** Develop joint proposals integrating AI methodologies with domain-specific expertise.
- **UNT AI Summer Research Program:**
    - Co-coordinated annually by Drs. Mark Albert and Ting Xiao.
    - Provides free summer research opportunities for UNT students.
    - Connects faculty and students through interdisciplinary AI research projects.

