Tianle Chen

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Education

Boston University — Boston, MA
Ph.D. in Computer Science — *Sep. 2024 – Present*

The Ohio State University — Columbus, OH
B.S. in Mathematics and B.S. in Computer Science — *Aug. 2019 – May 2024*

Publications

Chen, Tianle, Chakka, Chaitanya, Akula, Arjun Reddy, Thomas, Xavier, and Ghadiyaram, Deepti. *Some Modalities are More Equal Than Others: Decoding and Architecting Multimodal Integration in MLLMs*.
CVPR 2026 Findings.

Chen, Tianle, Chakka, Chaitanya, and Ghadiyaram, Deepti. (2025). *Improving Physical Object State Representation in Text-to-Image Generative Systems*.
CVPR 2025 Workshop.

Li, Ming, Zhong, Jike, **Chen, Tianle**, and Psounis, Konstantinos. (2025). *EEE-Bench: A Comprehensive Multimodal Electrical And Electronics Engineering Benchmark*.
CVPR 2025.

Pan, Tai-Yu, Ma, Chenyang, **Chen, Tianle**, Phoo, Cheng Perng, Luo, Katie Z., You, Yurong, Campbell, Mark, Weinberger, Kilian Q., Hariharan, Bharath, and Chao, Wei-Lun. (2024). *Pre-training LiDAR-based 3D Object Detectors through Colorization*.
ICLR 2024.

Chen, Tianle, Mai, Zheda, Li, Ruiwen, and Chao, Wei-Lun. (2023). *Segment Anything Model (SAM) Enhances Pseudo-Labels for Weakly Supervised Semantic Segmentation*.
NeurIPS 2023 Workshop.

Zhang, Cheng, Pan, Tai-Yu, **Chen, Tianle**, Zhong, Jike, Fu, Wenjin, and Chao, Wei-Lun. (2022). *Learning with Free Object Segments for Long-Tailed Instance Segmentation*.
ECCV 2022.

Manuscripts Under Review / In Submission

Chen, Tianle and Ghadiyaram, Deepti. *A Systematic Study of Cross-Modal Typographic Attacks on Audio-Visual Reasoning*.
Under Review / Preprint.

Wang, Chenyu, **Chen, Tianle**, Ahmad, H. M. Sabbir, Batmanghelich, Kayhan, and Li, Wenchao. *VLM-UQBench: A Benchmark for Modality-Specific and Cross-Modality Uncertainties in Vision Language Models*.
In Submission / Preprint.

Kim, Joon Tai, **Chen, Tianle**, Dong, Ziyu, Kunchala, Nishanth, Guller, Alexander, Ospina Acero, Daniel, Williams, Roger, and Kumar, Mrinal. *Centralized Copy-Paste: Enhanced Data Augmentation Strategy for Wildland Fire Semantic Segmentation*.
AIAA SciTech 2026 / Preprint.

Work Experience

Google Research — San Francisco Bay Area, CA
Research Intern — *May 2026 – Aug. 2026*

- Conducting research on robust multimodal LLMs, with emphasis on audio-video reasoning, evidence allocation, counterfactual evidence construction, and model behavior under conflicting or misleading multimodal cues.
- Exploring attention-aware supervision and self-distillation strategies that use feedback-improved teacher responses and evidence patterns to improve multimodal grounding.

Research Experience

Boston University, Image and Video Computing (IVC) Group — Boston, MA

Research Assistant (Advisor: Dr. Deepti Ghadiyaram) — *Sep. 2024 – Present*

- **Some Modalities Are More Equal Than Others: Decoding and Architecting Multimodal Integration in MLLMs (CVPR 2026 Findings):** Designed audio-video-text conflict benchmarks and evaluated open-source/commercial MLLMs to diagnose modality bias, semantic override, hallucination, and robustness failures through black-box metrics and white-box attention/log-probability analyses.
- **A Systematic Study of Cross-Modal Typographic Attacks on Audio-Visual Reasoning (Under Review):** Developed semantic-injection attacks through spoken audio, on-screen text, and textual prompts across audio-visual QA and safety/content-moderation settings, analyzing attack success, accuracy drop, stealth trade-offs, and mitigation prompts.
- **Improving Physical Object State Representation in Text-to-Image Generative Systems (CVPR 2025 Workshop):** Developed an automatic synthetic-data pipeline for physical object states and finetuned open-source T2I models, improving GenAI-Bench by **8.2%** and two new object-state datasets by **17%**/**24%**.
- **VLM-UQBench: A Benchmark for Modality-Specific and Cross-Modality Uncertainties in Vision–Language Models (In Submission):** Developed a benchmark with curated human-labeled samples and synthetic perturbations to evaluate modality-specific uncertainty, calibration, and reliability in VLMs.

Machine Learning as the Basis Lab, OSU — Columbus, OH

Research Assistant (Advisor: Dr. Wei-Lun Chao) — *Sep. 2021 – May 2024*

- **Segment Anything Model (SAM) Enhances Pseudo-Labels for Weakly Supervised Semantic Segmentation (NeurIPS 2023 Workshop):** Prototyped a method using SAM masks to improve pseudo-label quality for weakly supervised semantic segmentation; designed experiments, replicated baselines, and maintained the code base.
- **Pre-training LiDAR-based 3D Object Detectors through Colorization (ICLR 2024):** Contributed to a colorization-based 3D detector pre-training framework for autonomous driving and generated 3D visualizations for publication.
- **Learning with Free Object Segments for Long-Tailed Instance Segmentation (ECCV 2022):** Used co-segmentation models to extract object segments from web images and designed ranking methods to filter high-quality segments for long-tail recognition.
- **Sensor Adaptation for 3D Detection:** Developed a LiDAR data adaptation pipeline for unlabeled data with different scan patterns, achieving over **10%** improvement on synthetic datasets.

Laboratory for Autonomy in Data-Driven and Complex Systems, OSU — Columbus, OH

Research Assistant (Advisor: Dr. Mrinal Kumar) — *Aug. 2023 – May 2024*

- **Centralized Copy-Paste: Enhanced Data Augmentation Strategy for Wildland Fire Semantic Segmentation (AIAA SciTech 2026):** Proposed a data augmentation method that extracts, centralizes, and pastes refined fire clusters to mitigate scarce labels and class imbalance in drone-based fire segmentation.
- **Wildfire Image Segmentation:** Developed segmentation models with multiple backbones to classify wildfire, vegetation, and ash; curated and annotated a dedicated wildland-fire image dataset.

The Ohio State University, Computer Science Department — Columbus, OH

Research Assistant (Advisor: Dr. Arnab Nandi) — *Jan. 2024 – May 2024*

- **ReelMaker: Content-Based Short-Form Video Synthesis:** Developed a multimodal summarization pipeline that synthesizes concise short videos from academic presentations using PDF parsing, computer vision, speech-to-text, and LLMs while aligning visual clips, transcripts, and paper context.

Capstone Research Project, OSU — Columbus, OH

Team Member (Advisor: Dr. Arnab Nandi) — *Aug. 2023 – Jan. 2024*

- **Talk-to-TikTok:** Led development of an automated video editing pipeline that converts long videos and papers into concise TikTok-style clips using deep learning and LLMs. Awarded **Most Innovative Project** at HackOHI/O Hackathon.

Math Cycle Program, OSU — Columbus, OH

Mentee (Mentor: Brantley Vose) — *Jan. 2022 – Apr. 2022*

- **Topological Loss for Image Segmentation:** Developed software to compute persistent homology and integrated a topology-aware loss function into segmentation-model training. Presented a poster at the OSU Cycle conference.

Community Service

Reviewer for CVPR (2024–2026), AAAI (2025–2026), ICLR (2025–2026), ICCV 2025, WACV 2026, COLM 2026, TCSVT, and IJCV.

Student Academic Chair, BU AI Research Initiative (AIR) community – organized AIR Seminar programming and academic events (Oct. 2024 – Aug. 2025).

Teaching Experience

Boston University, Computer Science Dept Boston, MA

Teaching Fellow, CS 455: Computer Networks *Jan. 2025 – May 2025*

- Delivered lectures, led labs, graded assignments, and mentored students on network architecture, routing, transport protocols, latency, and congestion-control concepts.

The Ohio State University, CSE Dept Columbus, OH

Teaching Assistant *Oct. 2020 – May 2021 & Sep. 2023 – May 2024*

- CSE 1223: Intro to Computer Programming in Java (Oct. 2020 – May 2021).
- CSE 2321: Foundations I: Discrete Structures (Sep. 2023 – May 2024).

Honors & Awards

Dean's List (All attended semesters).

HackOHI/O 11: Most Innovative Project Award.

Technical Skills

Tools: PyTorch, TensorFlow, Hugging Face Transformers, OpenCLIP/CLIP, Qwen-VL/Qwen-Omni, LLaVA-style models, Gemini APIs, WandB, Git, Docker, Anaconda, Jupyter, AWS S3

Languages: Python, MATLAB, Java, C, R, SQL, LaTeX

Research Areas: Multimodal LLMs, vision-language/audio-video reasoning, generative AI, robustness and safety, uncertainty quantification, interpretability, semantic segmentation, 3D detection