

Tracy (Yixin) Zhu

[Email](#) | [Website](#)

EDUCATION

University of Chicago

M.S. in Statistics

Chicago, IL

Sept 2023 - Mar 2025

- GPA: 3.8

- Relevant courses: Past Meets Present: A Tale of Two Visions, Introduction to Computer Vision, Information and Coding Theory, etc.

New York University

B.A. in Data Science and Mathematics

New York, NY

Sept 2019 - May 2023

- GPA: 3.75

- Honors: Dean's List of Year 2023 and 2022; 4 graduate-level courses

PEER-REVIEWED PAPERS

* indicates equal contributions.

Peer-Reviewed Papers

- [1] Tracy Zhu*, Yukai Yang*, Marco Morucci, Tim G.J. Rudner. **A Systematic Assessment of Weak-to-strong Confidence Prediction in Large Language Models.**
Under Review.
- [2] Tracy Zhu*, Yukai Yang*, Marco Morucci, Tim G.J. Rudner. **Weak-to-strong Confidence Prediction.**
Workshop on Statistical Foundations of Large Language Models, Attributing Model Behavior at Scale, Safe Generative AI, and Regulatable ML, NeurIPS 2024.
- [3] Hongyi Zheng, Tracy Zhu, Lavender Yao Jiang, Kyunghyun Cho, Eric Karl Oermann. **Making the Most Out of the Limited Context Length: Predictive Power Varies with Clinical Note Type and Note Section.**
ACL Student Research Workshop, 2023.

PROJECTS

Studying Spatial and 3D Aware Vision Encoders for Vision Language Action Models | *Multimodal Learning, Representation Learning*

- Research advised by Prof. Chen Wei
- Developed a controlled evaluation protocol for swapping vision encoders in SOTA VLAs, finding that a single encoder can reach parity with the dual encoder setup under matched training conditions
- Operationalized "3D awareness" in VLA representations via a lightweight probing over multiple latent 3D properties, enabling model level comparisons beyond task success metrics
- Studied how injecting 3D aware visual features into the perception stack affects action prediction and generalization across viewpoint and scene variations

Weak-to-Strong Confidence Prediction | *Uncertainty Quantification, Representation Learning*

- Research advised by Prof. Tim G. J. Rudner and Prof. Marco Morucci
- Examined the weak-to-strong confidence prediction framework for LLMs and empirically demonstrated that the behavior of a "stronger" language model can be predicted using embeddings from "weaker" open-access models, improving generator reliability in selective prediction
- Analyzed key determinants of weak-to-strong confidence prediction, revealing that performance depends more on alignment between weak-model embeddings and strong-model decision boundaries than on model scale alone
- Conducted extensive ablation studies, demonstrating that the evaluation results are robust across label distributions and embedding aggregation strategies
- Constructed six question answering benchmark datasets that contain external signals of LLM answer-correctness uncertainty

Enhancing Geometry Consistency in Generative Vision Models | *Generative models, Diffusion models*

- Research advised by Prof. Anand Bhattad, Prof. David Forsyth, and Prof. Svetlana Lazebnik
- Enhanced diffusion model generation by conditioning on projective geometry cues to improve geometry consistency
- Demonstrated that SOTA models fail to preserve consistent perspective geometry between inputs and outputs

- Developed an evaluation framework using MMD and Relative Density to Ratio metrics to quantify geometric fidelity

3D Scene Reconstruction through Structure from Motion (SfM) | 3D reconstruction

- Reconstructed 3D scenes with two sets of 2D photos
- Implemented incremental SfM with global bundle adjustment
- Visualized 3D points cloud through Trimesh

Interest Point Detection in Generative Models with SIFT | Interest Point Detection, SIFT, Generative Models

- Adapted SIFT to label ground truth images with point-wise and distribution-wise interest point mappings
- Trained offsets in StyleGAN with labeled interest points for enhanced control
- Combined k-means clustering with SIFT to improve quality of labels

Active Learning on Protest Images Using Function-Space VI | Social Science Image Labeling, Active Learning

- Implemented active learning heuristics using function-space variational inference model to label social science protest images
- Benchmarked the performance of HARA-based heuristics in active learning
- Applied informative Gaussian priors on deep Bayesian models to select informative images

GRANTS

NYU Summer Research Grant <i>Center for Data Science, New York University</i>	Jun-Aug 2024 New York, NY
<ul style="list-style-type: none"> • \$4800 award supported by Prof. Tim G. J. Rudner • Contributed to a paper on Weak-to-Strong Confidence Prediction of Large Language Models 	
NYU Dean's Undergraduate Research Fund <i>Wasserman Center for Career Development, New York University</i>	Jan-May 2022 New York, NY
<ul style="list-style-type: none"> • \$1000 research grant to support undergraduate research • Studied active learning with entropy-based heuristic for vision models 	

ACADEMIC EXPERIENCE

Reviewer <i>Remote</i>	Oct 2024
<ul style="list-style-type: none"> • Served as a reviewer for NeurIPS 2024 & 2025, AISTATS 2026 	
Student Researcher (Remote) <i>Center for Data Science, New York University</i>	Feb 2024 - Oct 2024 New York, NY
<ul style="list-style-type: none"> • Conducted experiments with a linear probe to evaluate LLM uncertainty using representations from white-box LLMs in a generalizable evaluation framework and analyzed the learned information • Drafted manuscripts and created visualizations, including plots and tables, for a resulting workshop paper 	
Student Research Assistant <i>Center for Data Science, New York University</i>	Jun – Sept 2023 New York, NY
<ul style="list-style-type: none"> • Implemented and experimented with heuristics functions in active learning for image classification for social science • Mentored two undergraduate students from the Center for Data Science Undergraduate Research Program at NYU 	
Teaching Assistantship <i>Center for Data Science, New York University</i>	Jun 2022 - May 2023 New York, NY
<ul style="list-style-type: none"> • 2023: DS-UA 301 Advanced Topics in Data Science: Techniques in Deep Learning, Jan 2023 - May 2023 • 2022: DS-UA 201 Causal Inference, Jun 2022 - Aug 2022 	