

## Jiayi Zhou

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## RESEARCH INTERESTS

Driven to design explainable and accessible machine learning systems that foster trust in real-world applications, with research interests spanning machine learning, computer vision, and interdisciplinary applications focused on transparency and usability.

## EDUCATION

### Duke University

M.S. in Interdisciplinary Data Science, GPA: **3.96**

Durham, NC

May 2025

### Wake Forest University

B.S. in Computer Science & Mathematical Statistics, **Summa Cum Laude**, GPA: **3.92** May 2023

Winston-Salem, NC

## Publications

Accepted / Published

1. **On Thin Ice: Towards Explainable Conservation Monitoring via Attribution and Perturbations.** Zhou, J., Aghakishiyeva, G. *et al.* In *NeurIPS 2025, Imageomics Workshop*.
2. **Photorealistic Inpainting for Perturbation-based Explanations in Ecological Monitoring.** Aghakishiyeva, G., Zhou, J. *et al.* In *NeurIPS 2025, Imageomics Workshop*.

Under Review

3. **Det-LIME: Detector-Aware, Multi-Instance LIME for Explainable Object Detection in Ecological Applications.** Zhou, J., Johnston, D. W., & Bent, B. Under review.
4. **Seeing the Forest and the Trees: Explainable AI in Ecology.** Bent, B., Houlston, H., Zhou, J., Aghakishiyeva, G., & Johnston, D. Under review.

## RESEARCH EXPERIENCE

### Research Assistant, The TRUST Lab, Duke University

May 2025 – Present

*Consilience: AI-Augmented Interdisciplinary Research*

- Designed and implemented randomized controlled trials to evaluate the effectiveness of a voice-based LLM system (Consilience) in facilitating interdisciplinary collaboration, measuring short- and long-term impacts on team communication and research integration.
- Developed evaluation framework and metrics, including LLM-as-a-judge assessments, faculty reviews, and participant surveys, to systematically analyze the influence of AI-mediated dialogue.

*Explainability in Conservation*

- Engineered and optimized a computer vision pipeline using YOLOv9, YOLOv8-Seg, and Faster R-CNN to detect and segment marine wildlife from high-resolution drone imagery.
- Evaluated and implemented adaptations of Explainable AI (XAI) methods, including LIME, HiResCam, and LayerCAM, to analyze models and explain predictions for use in ecology.

### Graduate Researcher, Applied Ethics+, Duke University

May 2024 – July 2024

- Led a team of four graduate students to build a structured dataset documenting the historical contributions of women in AI.
- Performed data wrangling and created interactive visualizations in Python to reveal longitudinal trends, culminating in 12 actionable policy recommendations to promote equity in AI.

## SELECTED PROJECTS

### Comparative Benchmarking for Obscured Object Detection (M.S. Capstone)

- Experimented comparing 2D (YOLO) and 3D (BEVFormer) traffic cone detection under partial occlusion, revealing trade-offs between accuracy and computational efficiency.

### Juries and Trials in North Carolina Counties (B.S. Capstone)

- Developed interpretable decision-tree and linear models in R to analyze ten years of felony case activity reports, exploring trends and explaining factors influencing criminal trial rate variations.