

# LANGTIAN MA

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## ABOUT ME

I'm a **Statistics** PhD student focusing on **Generative AI** (Diffusion Models) and **Computational Biology**, with strong foundations in **Mathematics** and **Software Engineering**. My current research focuses on developing **controllable** and **trustworthy** deep generative models for scientific discovery.

## EDUCATION

University of Wisconsin - Madison

Ph.D. in Statistics.

Madison, Wisconsin

August 2024 - Present

Southern University of Science and Technology

B.S. in Statistics.

Shenzhen, China

August 2020 - June 2024

University of Toronto

Exchange student, Faculty of Arts and Science.

Toronto, Canada

September 2023 - December 2023

## PUBLICATIONS & PREPRINTS

[1] Tianle Zhang, **Langtian Ma**, et al. "Rethinking Human Evaluation Protocol for Text-to-Video Models: Enhancing Reliability, Reproducibility, and Practicality." *NeurIPS 2024*.

[2] Yirui Huang\*, **Langtian Ma**\*, et al. "Quantifying the Hierarchical Scales of Scientific Mobility." *International Conference on Computational Social Science (IC2S2)*, 2024. <sup>\*</sup>Equal contribution

## RESEARCH & PROJECTS

**Diffusion Models for Single-Cell Data Generation**

University of Wisconsin-Madison

Research Assistant | Advisor: [Prof. Kris Sankaran](#)

Jun 2025 – Present

- Built a customizable and reusable pipeline for single-cell data modeling and simulation with **diffusion models**.
- Developing controllable generation methods to synthesize out-of-distribution single-cell data.

**scDesigner: Single-Cell Data Simulation Package**

University of Wisconsin-Madison

Research Assistant | Advisor: Prof. Kris Sankaran

Jun 2025 – Present

- Designing extensible simulator modules with scikit-learn-style API and **object-oriented** design.
- Developed fast copula modules, achieving  $1.2\times$  faster fitting and  $35\times$  faster sampling with 20% partial modeling.

**Human Evaluation Protocol for Text-to-Video Models**

Research Collaboration (with Shanghai AI Lab) | Collaborator: Tianle Zhang

Apr 2024 – Aug 2024

- Co-designed an efficient human evaluation protocol for text-to-video models, reduced annotation cost by 53%.
- Quantified the efficiency-reliability trade-off, showing that the reliability loss does not affect the final conclusions.

**Causal Estimation for Logistic Models**

Southern University of Science and Technology

Undergraduate Researcher | Advisor: Yuting Ye

Mar 2024 – May 2024

- Analyzed bias of instrumental variable estimators in confounded logistic models under model misspecification.
- Proposed a method to mitigate confounding bias, with theoretical conditions and empirical validations.

**Scientific Mobility and Career Dynamics**

Southern University of Science and Technology

Undergraduate Researcher | Advisor: Prof. Yifang Ma

Jul 2022 – Dec 2022

- Analyzed hierarchical patterns in academic career mobility using large-scale bibliometric data from OpenAlex.
- Demonstrated the historical variation of scientific mobility across different administrative regions.

**Interpretability of Recommender Systems** (Course Project)

University of Wisconsin - Madison

- Identified key features that influence the predictions of the LightGCN model using Integrated Gradients method.
- Developed a concept-customizable recommendation method via Concept Activation Vectors.

## TECHNICAL STRENGTHS

**Programming Languages:** Python, Java, R, C, Julia.

**Software Engineering:** Git, Docker, Linux, CLI Tools, Object-oriented Design, Package Development.

**Machine Learning & Scientific Computing:** PyTorch, PyTorch Lightning, Scikit-learn, Pandas, NumPy, SymPy.