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RESEARCH INTEREST

I am interested in the principles of extracting structure from data — representation learning — and in its interplay with the generative models that live on these representations. I believe this interplay holds the key to the next generation of AI: systems with high sample efficiency and long-term memory.

EDUCATION

2025 - present	PhD Student <i>School of Engineering, Westlake University</i> Research interests: Representation Learning, Generative Models Supervisor: Prof. Tailin Wu
2018 - 2023	Undergraduate <i>Astronomy, Nanjing University</i>

RESEARCH HIGHLIGHTS

*co-first authors

Representation Learning & Generative Models

Feature Information Dynamics in Diffusion (Pan+, submitted to NeurIPS 2026)

An information-theoretic framework that **localizes when a feature is generated** during diffusion, connecting feature mutual information to a denoising-loss gap via the I-MMSE identity. It quantitatively exposes **fundamental differences in generation order across prevalent representations of natural images**.

Test-time Scaling of Diffusion Models

VFScale: Intrinsic Reasoning through Verifier-Free Test-time Scalable Diffusion Model (Zhang*, Pan*+—ICLR 2026)

Achieves **verifier-free test-time scaling** by using the diffusion model’s **intrinsic energy function as the verifier**, coupled with a hybrid Monte Carlo Tree Search. Trained on 6×6 Mazes, it **solves 88% of 15×15 Mazes** where standard diffusion models completely fail.

REFERENCES

Prof. Tailin Wu Westlake University	Assistant Professor <i>email: wutailin@westlake.edu.cn</i>
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Prof. Yuan-Sen Ting Ohio State University	Associate Professor <i>email: ting.74@osu.edu</i>
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CV design adapted from Prof. Yuan-Sen Ting’s curriculum vitae.