Wanning He

Hanover, NH, USA

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Education

Sep 2025 – Jun 2027 **Dartmouth College, Hanover, NH, USA**
- M.S. in Computer Science (4.0/4.0), Advisor: Prof. Yu-Wing Tai

Sep 2019 – Jul 2022 **Shanghai University of Finance and Economics, Shanghai, China**
- M.S. in Statistics

Sep 2015 – Jul 2019 **Northeastern University, China**
- B.S. in Mathematics and Applied Mathematics (90.3/100), Ranking: 1/35

Research Interests

I am interested in generative models and their applications. Some of the specific interests focus on human motion, including:
- Generation and synthetic motion data [2]
- World models and embodied, physically grounded dynamics
- Understanding and generation for sports AI

Publications and Preprints

[1] **Wanning He***, Yuyao Zhang*, Yu-Wing Tai. **RefRoute: Decoupling Conditioning Cost from References via Compact Residual Conditioning and Spatial Routing.** arXiv preprint, 2026. [paper]

[2] Yiwen Yan, **Wanning He**, Yu-Wing Tai. **Beyond MoCap: Scaling Motion Tokenizers with Synthetic Human Motion for Generative Modeling.** arXiv preprint, 2026. [paper]

* indicates equal contribution.

Research Experience

May 2026 – Present **Dartmouth College, Visual AI Lab - Hanover, NH, USA**
Graduate Researcher, co-first author. Advisor: Prof. Yu-Wing Tai
- Working on RefRoute, efficient multi-reference image generation, where conditioning cost in diffusion transformers grows with every added reference image.
- Proposed compact residual conditioning with condition and attention routing to decouple cost from reference count; built the RefRoute-Data pipeline and the ManyRef100 benchmark.
- At 16 references, 18.3× (50-step) and 14.2× (4-step) faster than FLUX baselines, with Weighted-Ref-VIEScore 36.06 vs. 8.88 (FLUX.2-Klein-9B). Preprint on arXiv.

Mar 2026 – May 2026 **Dartmouth College, Visual AI Lab - Hanover, NH, USA**
Graduate Researcher, second author. Advisor: Prof. Yu-Wing Tai
- Worked on Beyond MoCap, scaling motion tokenizers whose vocabulary coverage is limited by the scarcity of motion-capture data.
- Led the experiment design and implementation of VQ-VAE tokenizer training, ablations, and evaluation; integrated the tokenizer into T2M-GPT, MotionGPT, and Motion-Agent.
- Showed the bottleneck is representation support, not codebook size: reconstruction FID −42% (0.132 → 0.076) and text-to-motion FID −16–24% across three backbones. Preprint on arXiv.

Professional Experience

Jun 2022 – May 2024 **Fourier Capital (quantitative hedge fund), Shanghai, China**
Quantitative Researcher.
- Built financial-data and feature pipelines shared across research, backtesting, and live trading, including a GP + RL factor-mining pipeline used by a 50-person research team.
- Optimized distributed processing and memory use, and implemented event-driven C++ systems with replay testing, monitoring, and staged deployment.

Awards, Honors, and Funding

Oct 2026	**First Prize** (team, $3,000), Daytona HackSprint w/ Arize AI — *Just Standup*	New York City
Oct 2026	**First Prize** (team, ~$6,950), VAST Builders Challenge — *FightLens*	New York City
2026	Both hackathon wins featured in "Kudos: Fall 2026"	Dartmouth CS
2026	**Class of 1961 Arts Initiative Fund** ($3,211) — *In Her Corner*	Dartmouth College
2026	**NSF ACCESS Discover Allocation** (PI, 750,000 credits, ~$13K)	NSF ACCESS
2026	**OpenAI Researcher Access Program** ($1,000 API credits)	OpenAI
2026	**Merit Scholarship** (100% tuition, $71,697)	Dartmouth College
2025	**Tuition Scholarship** (75% tuition, $55,745)	Dartmouth College
2021	**University-level Outstanding Student** (top 3%)	China
2019	**Provincial Outstanding Graduate** (top 0.2%)	China
2017	**National Scholarship** (top 0.2%, ~$1,100)	China

Teaching Experience

2025 – Present

Dartmouth College, Department of Computer Science

Teaching Assistant.

- Machine Learning and Statistical Analysis (COSC 274), Fall 2026 and Winter 2026
- Graph-based Machine Learning (COSC 89.39/189.39), Spring 2026
- Deep Learning (COSC 78/278), Fall 2025

Services

- Journal Reviewer: International Journal of Computer Vision (IJCV), 2026

Outreach and Creative Work

- Sports video creator: 57 posts on UFC, Brazilian jiu-jitsu, and boxing on Xiaohongshu; 190K+ views and 8.4K interactions.
- Digital storytelling: *In Her Corner*, a photography project on women in boxing; mentored by Prof. Harriette Yahr (Guarini Digital Storytelling Lab).