Tuen-Yue Tsui

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Education

University of Pennsylvania *Sept 2024 – Present*
MSE in Robotics

- GPA: 4.0/4.0 Core Courses: Learning in Robotics, Machine Perception, Differential Geometry

Wuhan University *Sept 2020 – Jun 2024*
BE in Artificial Intelligence

- GPA: 3.75/4.0

Research Experience

GRASP Lab, University of Pennsylvania *Philadelphia, USA*
Advisor: Lingjie Liu *Sept 2024 – Present*

- **Lead researcher** and sole architect of *Let Learning Circulate*, a new perspective on Continual Learning.
- Developed **a stream-native continual learning dynamics** for non-episodic, non-IID data streams, reframing CL as a fundamental learning paradigm.
- Introduced a coupled three-part learning dynamics built around a single evolving object: **an EMA K-FAC Fisher geometry** that is updated online and used to shape learning trajectories.
- Implemented **a Hamiltonian circulation** over the shaped metric to preserve capacity and sustain pressure toward representation reuse during streaming.
- Designed and implemented an **endogenous chaos engine** that injects bounded, anisotropic, reversible dynamics into the Hamiltonion flow.
- Early results on CIFAR-10 prior shift: no-replay accuracy match ER-based baselines, effective rank 7× higher. With replay enabled 10× fewer steps than ER to reach the same accuracy.

Machine Vision & Robotics Laboratory, Wuhan University *Wuhan, China*
Advisor: Qin Zou *Sept 2022 – Jun 2024*

- Resulted in a first-author preprint **NePF**, a fast single-stage inverse rendering framework (see Publications).

Publications

T.-Y. Tsui, Q. Zou. *NePF: Neural Photon Field for Single-Stage Inverse Rendering* (preprint, arXiv). Nov 2023

Projects

Scalable Quadruped Imitation from Monocular Video *github link*

- **CV/CG + Robotics.** Retargeted quadruped motions from monocular videos via a learnable skeleton; removed MoCap/manual keypoints.

Minimum-Snap Trajectory Generation for Quadrotors *github link*

- **SLAM + Planning + Control.** Integrated VIO, SE(3) controller, and ray-casting–powered A* (**30**× faster: **22 s** → **0.7 s**; **1st** on leaderboard) for path planning with a time-optimal snap solver.

Skills

Programming: C++, Python, C, MATLAB, SQL

Tools/Frameworks: ROS, PyTorch, JAX, Drake, Isaac Lab, Newton, Genesis, Linux, Git, Docker, Slurm

Languages: Cantonese (Native), Mandarin (Native), English (Full Professional)