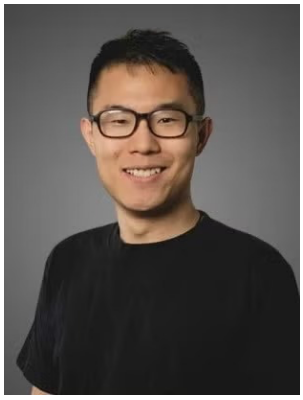
TECHNICAL COMMITTEE FOR
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2026-2027 TC Seminar Series

Time: December 3, 2026, 9AM ET
Zoom: https://dartmouth.zoom.us/j/94765993258?pwd=aErnkjFBqQaOTEgonxZkeNTbojHRbp.1



Dr. Fan Shi

National University of Singapore

Simulation Is Back: Scaling Contact-Rich, Long-Horizon Manipulation

Abstract: Robot learning fundamentally depends on access to abundant, high-quality, and low-cost data. Humanoid robots present unique challenges and opportunities—combining locomotion over rigid terrains (mostly) with manipulation of diverse, often deformable, objects. While synthetic data has driven remarkable progress in locomotion through deep reinforcement learning, manipulation remains limited by data scarcity and simulation fidelity. In this talk, I will discuss our recent advances in simulation technology inspired by our breakthroughs in computer graphics, aimed at enabling more effective humanoid learning for complex loco-manipulation tasks. Our new simulation engine delivers significant improvements in both speed and accuracy for deformable object dynamics, unlocking a wide range of contact-rich tasks previously deemed infeasible. I will conclude by outlining how these advances may shape the next frontier of humanoid intelligence, where realistic synthetic data bridges the gap between simulation and the real world.

Biography: Fan Shi is an Assistant Professor in the Department of Electrical and Computer Engineering at NUS, where he holds the NUS Presidential Young Professorship. His research focuses on AI for robotics, with particular interests in physical simulation and robot learning for humanoid manipulation and locomotion. He has received several international recognitions, including awards and support from leading organizations such as the NVIDIA Academic Grant Program, Google Research Funding, and Swiss AI Initiative. Before joining NUS, he was a Postdoctoral Researcher at the AI Center, ETH Zurich, working with Robotic Systems Lab and the Computational Robotics Lab. He earned his Ph.D. and M.S. degrees at the JSK Lab, University of Tokyo, and his B.S. degree at Yuanpei College, Peking University. Lab page link (https://nus-hcrl.github.io/)