香港浸會大學
HONG KONG BAPTIST UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE
計算機科學系

TMLR Young Scientist SEMINAR

2026 SERIES

Trustworthy Machine Learning and Reasoning Group



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Date: 16 October 2026 (Friday)
Time: 09:00 (Beijing Time, UTC+8)
Meeting: https://hkbu.zoom.us/j/6603117755

SkyDiscover: From Optimizing Algorithms to Synthesizing Systems

ABSTRACT

In this talk, I will present SkyDiscover, an open-source framework for AI-driven algorithm optimization and systems synthesis. Our adaptive self-optimization methods outperform four leading baselines, including GEPA, OpenEvolve, and ShinkaEvolve, surpass AlphaEvolve on selected mathematical optimization problems, and achieve 34% higher median scores than the strongest open-source baseline across 172 competitive programming problems.

I will then discuss SkySynth, which generates specialized end-to-end software systems tailored to specific workloads and requirements. To address the gap between passing tests and satisfying intended requirements, I will describe how we combine implementation synthesis with machine-checked proofs and iteratively refine executable specifications. Examples spanning key-value stores, LLM inference engines, and model routing illustrate the opportunities and challenges of agent-driven systems development, with performance and correctness as central goals.
Website: https://skydiscover-ai.github.io/

BIOGRAPHY

Shu Liu is a Ph.D. student in Computer Science at the University of California, Berkeley, advised by Prof. Ion Stoica in the Sky Computing Lab. Shu's research focuses on AI and systems, especially methods and infrastructure for self-improving agents. Shu develops tools that help agents tackle long-horizon coding tasks, improve software, and support scientific and systems discovery. Shu received a B.S. in Computer Science and Applied Mathematics from the University of Wisconsin–Madison. Recent projects include SkyRL and SkyDiscover.
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