



復旦大學
FUDAN UNIVERSITY

Applied Math Ph.D. Seminar

Reinforcement Learning for Heterogeneous DAG Scheduling with Weighted Cross-Attention

Speaker: Ruisong Zhou (Peking University)

Time: 2025-09-25, 16:10 to 17:00

Location: Rm 1801, Guanghai East Tower

Advisor: Zaiwen Wen (Peking University)

Abstract: Efficient scheduling of directed acyclic graphs (DAGs) in heterogeneous environments is challenging due to diverse resource capacities and intricate dependencies. In practice, scalability across environments with varying resource pools, task types, and other settings, alongside rapid schedule generation, complicates these challenges. We propose WeCAN, an end-to-end reinforcement learning framework excelling in heterogeneous DAG scheduling featuring task-resource compatibility. WeCAN rapidly generates schedules through single-pass network inference. Leveraging the weighted cross-attention layer, WeCAN utilizes all available environment information while preserving scalability across diverse heterogeneous environments. Moreover, we introduce a criterion to analyze the optimality gap inherent in list scheduling based methods, revealing barriers preventing these methods from consistently finding optimal solutions. The skip action introduced in our framework addresses this gap. Our approach delivers robust performance and scalability, outperforming state-of-the-art methods across diverse datasets.