復旦大學
FUDAN UNIVERSITY

Applied Math Ph.D. Seminar

Near-Optimal Algorithms for Convex Simple Bilevel Optimization under Weak Assumptions

Speaker: Xu Shi (Fudan University)

Time: 2025-04-24, 16:10 to 17:00

Location: Rm 1801, Guanghua East Tower

Advisor: Rujun Jiang (Fudan University)

Abstract: This work considers the simple bilevel optimization problem, which involves minimizing a composite convex function over the optimal solution set of another composite convex minimization problem. By reformulating this bilevel problem as finding the left-most root of a nonlinear equation and introducing a novel dual approach for the subproblems, we efficiently obtain an (ϵ, ϵ)-optimal solution. The proposed methods achieve near-optimal complexity of $\tilde{\mathcal{O}}(1/\sqrt{\epsilon})$ for both the upper- and lower-level objectives under mild assumptions, aligning with the optimal complexity bounds of first-order methods in unconstrained smooth or composite convex optimization when ignoring logarithmic terms.