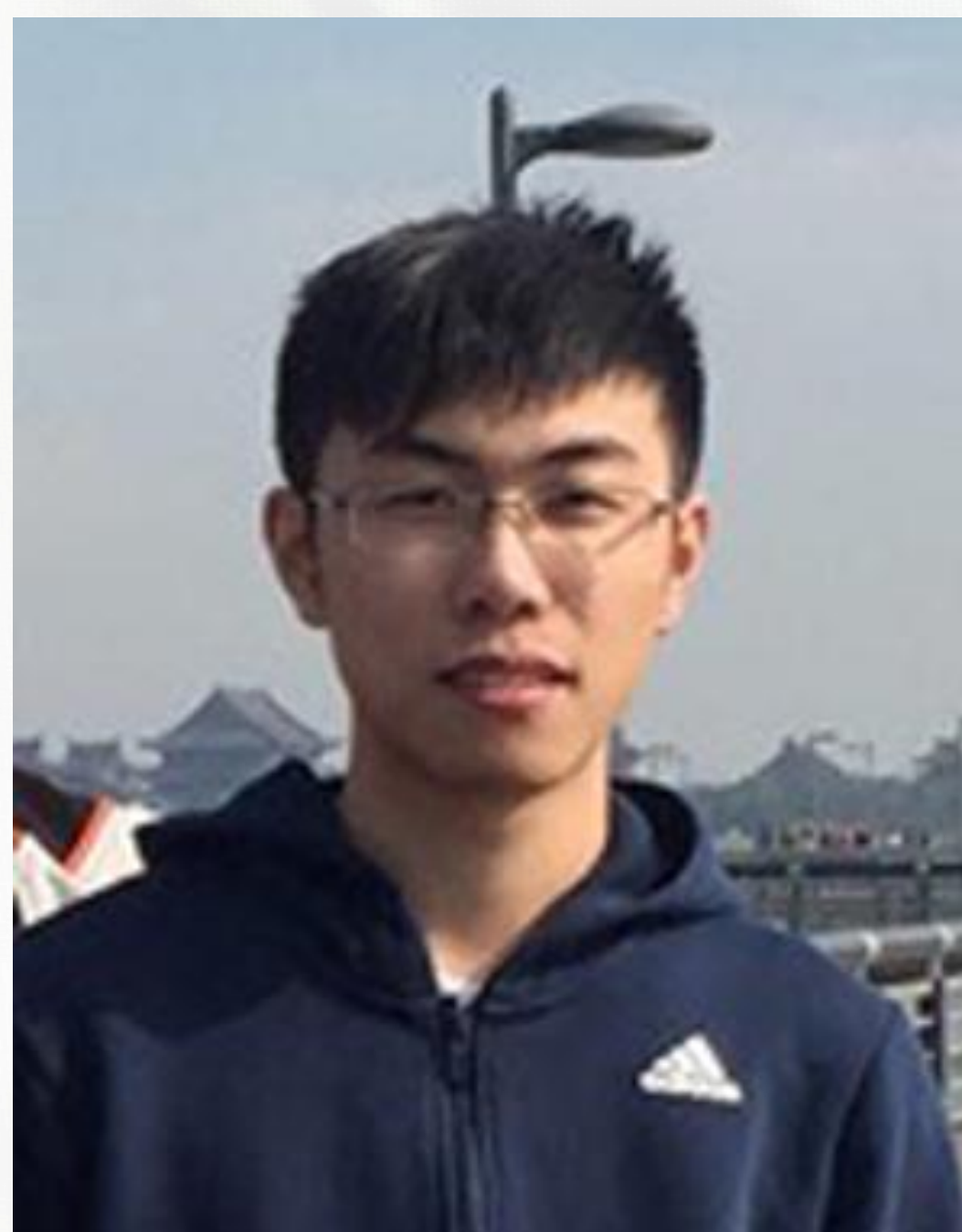




復旦大學

数据科学与深度学习
博士生与青年学者论坛

Non-unique Game over Compact Groups with Application in Cryo-EM Reconstruction for Symmetric Molecules



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时间：2026年9月21日15:00-16:00
地点：光华楼东主楼1801

Abstract: In this talk, we consider an extension of the non-unique game framework, an optimization problem over compact groups whose loss function depends only on relative transformations of the group elements, to address symmetric structures. A notable example is common lines based orientation estimation of cryo-EM images for molecules with point group symmetry. With a semidefinite programming relaxation, we turn the problem into a convex program that is solved with the alternating direction method of multipliers. Unlike existing approaches which are tailored to specific symmetry groups, ours provides a unified computational framework for addressing all point group symmetries. We demonstrate the applicability of the proposed algorithm on the cryo-EM orientation estimation problem on both simulated and experimental datasets. In particular, our algorithm is effective in generating high-quality ab initio models from only a few class averages computed from experimental images.

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