Applications of Large Language Models in Formal Reasoning

Speaker: Guoxiong Gao (Peking University)

Time: 2025-03-13, 16:10 to 17:00

Location: Rm 1801, Guanghua East Tower

Advisor: Bin Dong (Peking University)

Abstract: Interactive Theorem Provers (ITPs), often referred to as formal languages, offer a reliable method to eliminate errors in mathematical reasoning. Meanwhile, Large Language Models (LLMs) have shown great potential to accelerate—and even automate—the formalization process. In this talk, we will explore how LLMs are applied in key areas such as premise selection, tactic suggestion, auto-formalization, and automated theorem proving. Additionally, we will discuss how training datasets for these tasks are constructed, highlighting the impact of structural information on improving LLMs' performance in Lean-related tasks, particularly in LeanSearch and our statement formalizer.