Bridging Planning and Reasoning in Natural Language with Foundation Models (PLAN-FM)

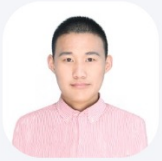
Organizers: Wenjun Li, Kangrui Wang, Harsha Kokel, Shirin Sohrabi, Manling Li

Advising Committee: Biplav Srivastava, Pradeep Varakantham

https://plan-fm.github.io/

Organizers and Advisors

Organizing Committee



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Program Agenda

9:00 – 10:30

Opening Remarks

Tutorial: A Brief Introduction to AI Planning

Tutorial: Real-World Applications and Benchmarks

11:00 – 12:30

Invited Talk:
David Hsu

Contributed Talk:

1. SAMKE: An Open-Ended Autonomous Foundation-Model-Based Agent for Meta-Knowledge Discovery
2. Next-Latent Prediction Transformers Learn Compact World Models
3. Rethinking Reward Models! A Conceptual Framework for Enhancing LLM Reasoning through Intrinsic Traits

Lunch Break

1:55 – 3:30

Invited Talk:
Pulkit Verma

Contributed Talk:

5. Metrics for Holistic Evaluation of LLM Reasoning about Action, Change, and Planning
6. ProofNet++: A Neuro-Symbolic System for Formal Proof Verification with Self-Correction

Invited Talk:
Asim Munawar

4:00 – 5:00

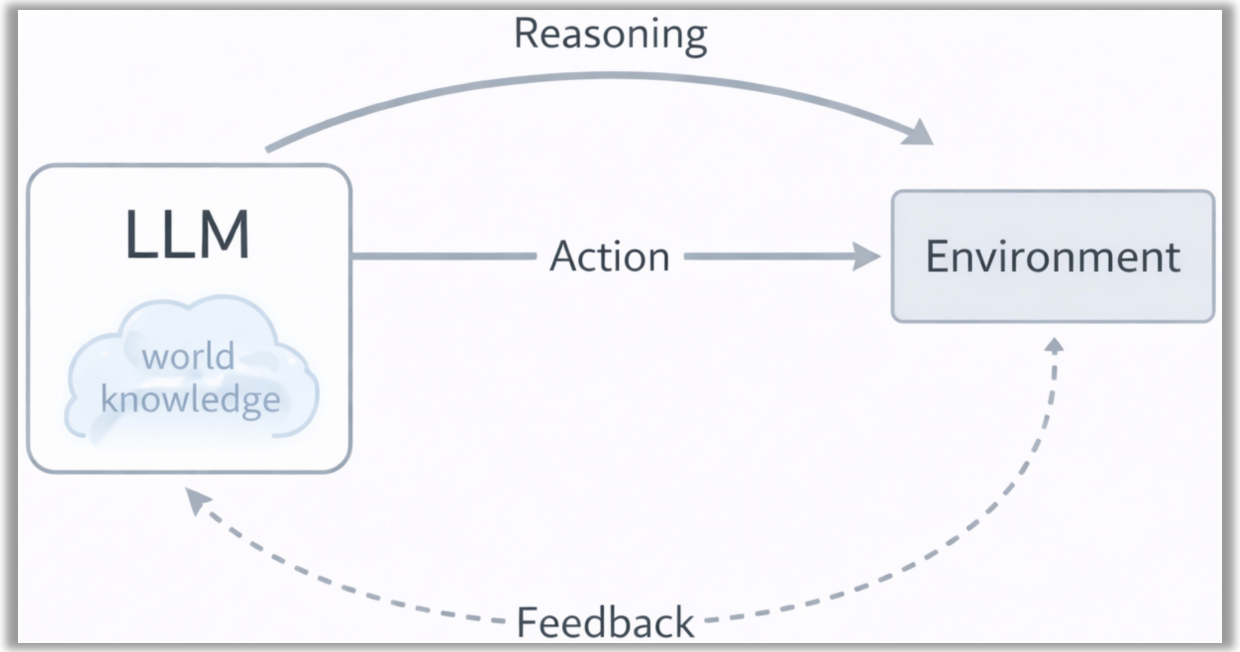
Closing Remarks

Poster Session

Why this Bridge?

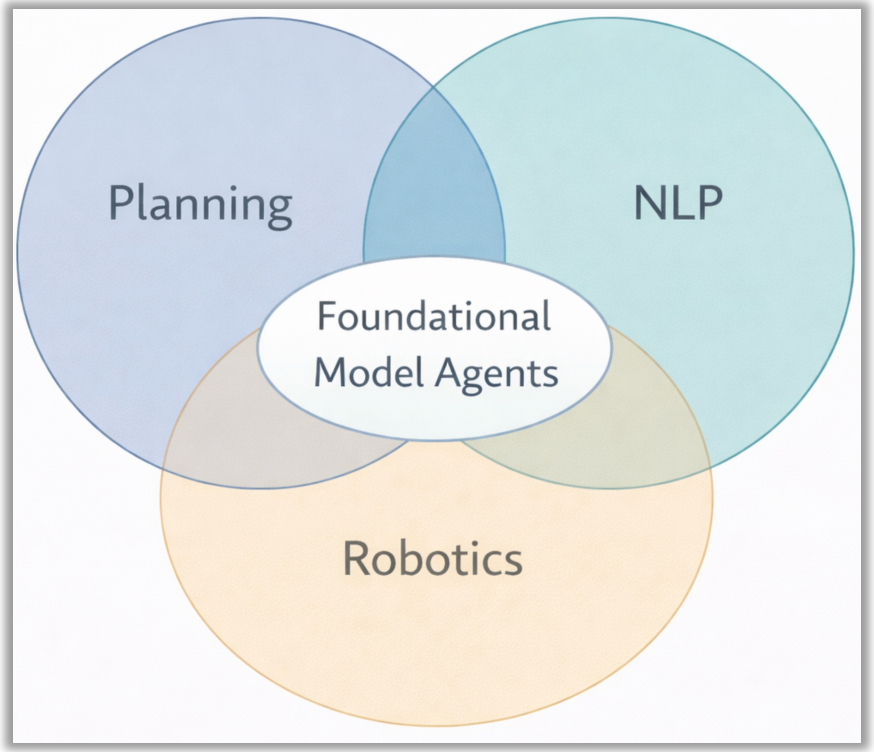
LLMs as Emerging Planning Engines

- Large Language Models (LLMs), trained for **next-token prediction**, now exhibit strong **reasoning-like behaviors**
- These capabilities are increasingly used for:
  - **Action planning**
  - **Sequential decision making**
  - **Multi-step interaction with environments**



NLP, Planning, and Robotics Must Converge Now

- Foundational models are increasingly used as **agents** that Plan, Act, Observe and Adapt
- This trend spans:
  - **NLP** (reasoning, prompting, tool use)
  - **Planning** (search, guarantees, abstraction)
  - **Robotics** (grounded action, uncertainty, safety)
- Yet today, each community uses different tools, vocabularies and different assumptions about “plans”



Planning Reasoning in Natural Language

- Foster interactions between NLP, Planning and Robotics researchers
- Provide a platform to discuss and exchange ideas
- Identify opportunities and pinpoint critical challenges