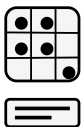**Fundamental Dimensions**

Graph Types
- Erdős–Rényi
- Barabási–Albert
- Scale-free, Bipartite ...

Serialization Formats
- Adjacency Lists
- Adjacency Matrices
- Edge Sets ...

Prompt Schemes
- Algorithmic, Chain-of-Thought
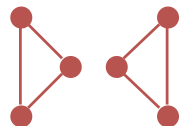- k-shot, Instructive, Zero-shot
- Few-shot, Multi-step ...

Other Format Factors
- Separator, Case format ...

Graph Tasks

Local Properties
- Connectivity Verification
- Cycle Detection

Global Properties
- Diameter Computation
- Triangle Counting
- Shortest-Path Identification
- BFS Order Reasoning

Other Tasks

LLM Models & Evaluation

LLM Models

Evaluation
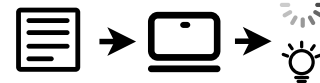- Performance Analysis
- Error Analysis

Findings

- *Moderate overall model performance with considerable room for improvement.*

50 %

- *High variability across different input format.*

- *RL can efficiently find near-optimal combinations with significantly lower LLM inference cost..*

Action 1
Serializations
Action 2
Prompts
Action N
Other factors