



Mechanistic Router for Interpretable Agent Orchestration

A Lightweight, Reinforcement-
Learning Query Router for LLMs

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Monolithic Reasoning is Suboptimal

Most LLMs apply the same reasoning strategy across all queries. This is often:

- Inefficient (wastes compute on simple tasks)
- Opaque (hard to trace why an answer is wrong)
- Wrong (uses inappropriate reasoning method)





Insight - Reasoning Should Be Routed

LLM routing is just one layer of a broader idea: Agent routing, where each agent adopts a different reasoning strategy. Why?

Each query demands a different cognitive mode:

- 🧠 CoT Agent: Decomposes problems via step-by-step logic
- 💻 PAL Agent: Writes and runs code when needed
- 🌐 ReAct Agent: Actively searches and responds in real time

Solution: Modular Routing Architecture

