Agent Leaderboard

Which LLMs Work Best for AI Agents?

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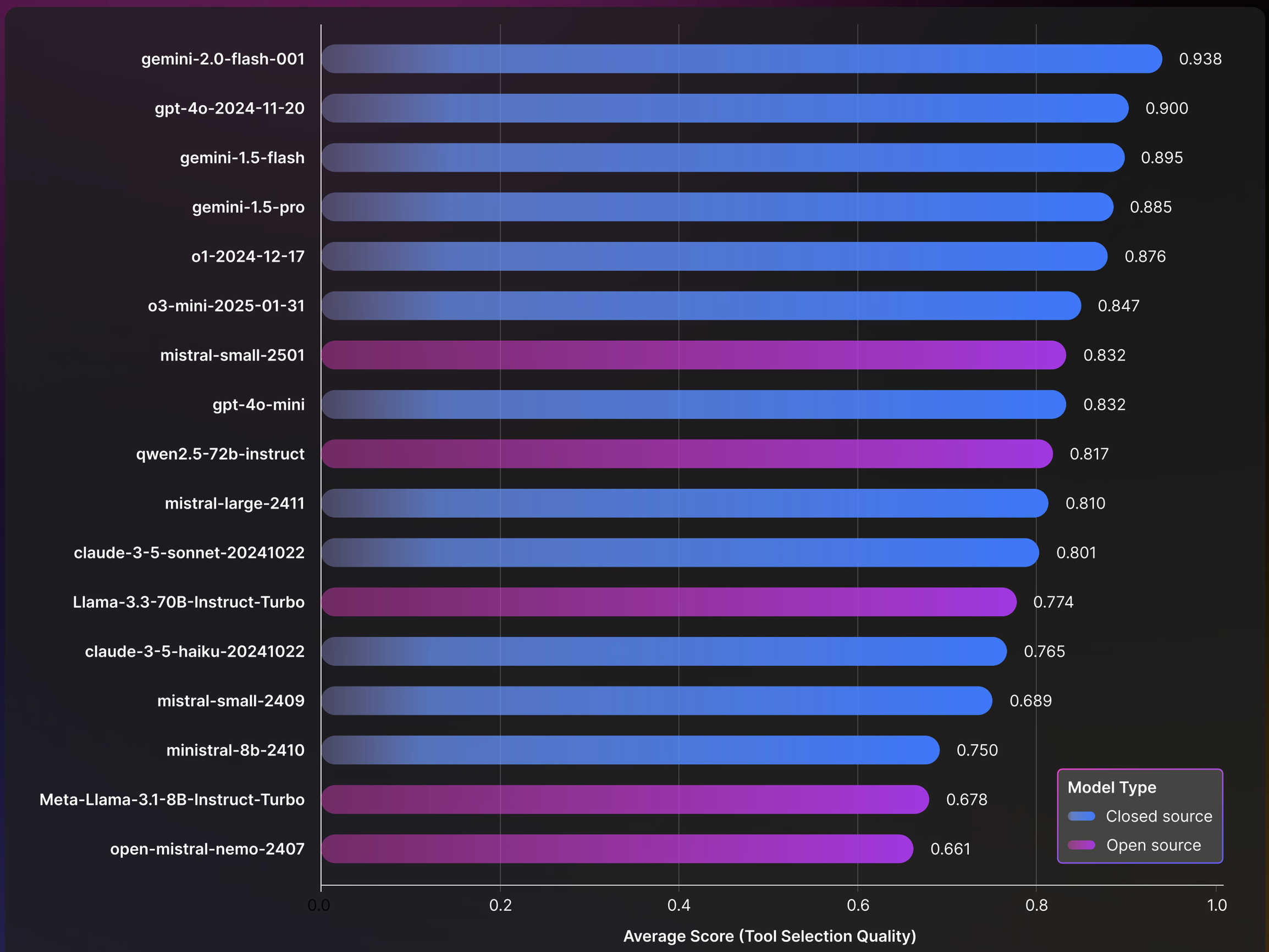
Top LLMs For AI Agents



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Agent Leaderboard on HuggingFace

Leaderboard

https://huggingface.co/spaces/galileo-ai/agent-leaderboard

17	14	TSQ
Total Models	**Evaluation Datasets**	**Evaluation Metric**
12 Private	Multi-domain Testing	Tool Selection Quality
5 Open Source	Real-world use cases	GPT-4o Based Judge

Tool calling performance on 14 datasets

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Performance Champion

Gemini-2.0-flash dominates with a 0.938 score at a **very** affordable cost, excelling in both complex tasks and safety features.

01

Overpriced Models

02

The top 3 models span **10x price** difference with only a 4% performance gap - some models are over-priced for their value for AI agents.

Open vs. Closed Source

03

Mistral-small-2501 leads in open source models and performs similar to GPT-4o-mini at 0.83, signaling OSS maturity in tool calling.

DeepSeek Misses

04

DeepSeek V3 and R1 were among the models that **failed to make the rankings** due to limited function support.

Dataset Overview

Tool Selection | Parallel Calling | Edge Cases

	Samples	Category	Dataset Name	Purpose
Single-Turn	100+100	**Single Function Call**	xlam_single_tool_single_call, xlam_multiple_tool_single_call	Evaluates basic ability to read documentation and make single function calls
	200 + 50	**Multiple Function Call**	xlam_multiple_tool_multiple_call, xlam_single_tool_multiple_call	Tests parallel execution and result aggregation
	100	**Irrelevant Query**	BFCL_v3_irrelevance	Tests ability to recognize when available tools don't match user needs
	100	**Long Context**	tau_long_context	Assesses handling of extended interactions and complex instructions
	100	**Missing Function**	xlam_tool_miss	Tests graceful handling of unavailable tools
Multi-Turn	50 + 30	**Single Function Call**	BFCL_V3_multi_turn_base_single_func_call, toolace_single_func_call	Tests basic conversational function calling abilities
	50	**Multiple Function Call**	BFCL_v3_multi_turn_base_multi_func_call	Evaluates handling of multiple function calls in conversation
	100	**Missing Function**	BFCL_v3_multi_turn_miss_func	Tests graceful handling of unavailable tools
	100	**Missing Parameters**	BFCL_v3_multi_turn_miss_param	Assesses parameter collection and handling incomplete information
	100	**Composite**	BFCL_V3_multi_turn_composite	Tests overall robustness in complex scenarios

Implications

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Implications for Agent Development

Choose Models Based on Task Complexity

01 Simple tasks work with most models. Complex workflows requiring multiple tools need models with 0.85+ scores in composite tests.

Plan for Error Handling

02 Models with low tool selection scores need guardrails. Add validation layers and structured error recovery, especially for parameter collection.

Consider Context Management

03 Long conversations require either models strong in context retention or external context storage systems.

Selecting Reasoning Models

04 While o1 and o3-mini excelled in function calling, DeepSeek V3 and R1 were excluded from rankings due to limited function support.

Implement Safety Controls

05 Add strict tool access controls for models weak in irrelevance detection. Include validation layers for inconsistent Performers.

Open vs Closed Source

06 Private models lead in complex tasks, but open-source options work well for basic operations. Choose your model based on your scaling needs.

What Makes Tool Calling Difficult?

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Tool Selection Dimensions

Precision

Accuracy in selecting appropriate tools and avoiding incorrect or redundant tool calls

Recall

Identifying and using all necessary tools for completing the task

Redundancy

Avoiding unnecessary tool calls when information is already available

Argument Complexity

Parameter Precision

Correct naming and value assignment for tool arguments

Completeness

Including all required arguments and proper handling of optional parameters

Decision Scenarios

Should Call Tools

- Calls correct tools → Success
- Doesn't call tools → Failure
- Calls partial tools → Recall issue

Should Not Call Tools

- Doesn't call tools → Success
- Calls tools → Redundancy issue
- Information in history → No tools needed

Get the Results and More Insights

Leaderboard

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