

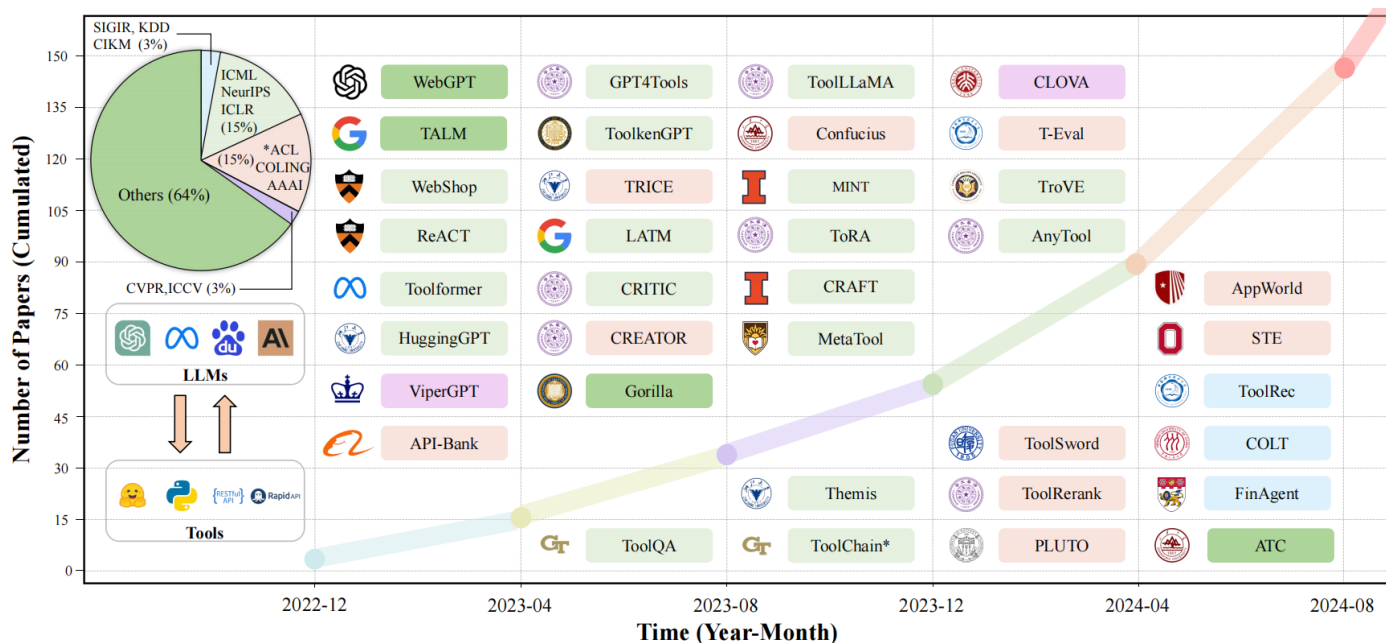
Tool Learning with Large Language Models: A Survey

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Problems & Ideas

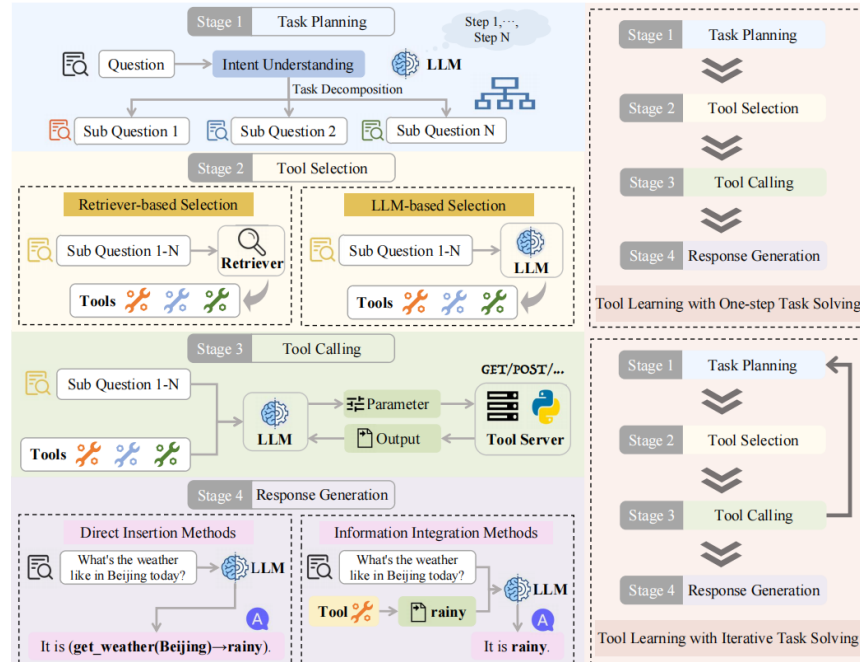
- Problems of **Tool Learning with Large Language Models**:
 - The past year has witnessed a rapid surge in research efforts on tool learning concurrent with the rise of LLMs.
 - It is essential to systematically review the most recent advancements and challenges of tool learning.
- Ideas: We focus on reviewing existing literature from two primary aspects: (1) **why tool learning is beneficial** and (2) **how tool learning is implemented**, enabling a comprehensive understanding of tool learning with LLMs.



An illustration of the development trajectory of tool learning.

Main Contributions

- Contributions:
 - We focus on reviewing existing literature from two primary aspects: (1) **why tool learning is beneficial** and (2) **how tool learning is implemented**, enabling a comprehensive understanding of tool learning with LLMs;
 - We provide a summary of **existing benchmarks and evaluation methods**, categorizing them according to their relevance to different stages;
 - We discuss **current challenges** and outline potential **future directions**, aiming to inspire researchers to further explore this promising area.



The overall workflow for tool learning with large language models.