

MetaGPT Open-Sources AFlow for Automated Agent Workflow Optimization

ICLR 2025 framework uses MCTS to generate optimal workflows, enhancing performance and attaining GPT-4 results at lower costs.

FRANCISCO, CA, UNITED STATES, April 21, 2025 /EINPresswire.com/ -- The MetaGPT open-source community, including researchers from DeepWisdom and HKUST(GZ), today released AFlow. This novel framework automates the generation and optimization of Agentic Workflows for large language models (LLMs). Accepted to the prestigious ICLR 2025 conference, this work addresses the significant manual effort and cost typically involved in designing and debugging effective agent workflows.

AFlow tackles the challenge by reformulating workflow optimization as a search problem. It represents workflows as code-based graphs, where nodes define LLM calls (model, prompt, and parameters), and edges represent logic and dependencies. Using Monte Carlo Tree Search (MCTS), AFlow systematically explores this space to discover the most effective workflow configuration for a given task, automatically handling prompt tuning and structural adjustments. The framework incorporates predefined "Operators" representing common agent patterns to enhance search efficiency.

AFlow: Automating Agentic Workflow Generation

Jiayi Zhang, Jinyu Xiang, Zhaoyang Yu, Fengwei Teng, Xiong-Hui Chen, Jiaqi Chen, Mingchen Zhuge, Xin Cheng, Sirui Hong, Jinlin Wang, Bingnan Zheng, Bang Liu, Yuyu Luo, Chenglin Wu

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TLDR: We introduce the field of Agentic Workflow Optimization and propose an effective search algorithm called AFlow, enabling it to surpass manually constructed workflows on six reasoning datasets.

Abstract

Large language models (LLMs) have demonstrated remarkable potential in solving complex tasks across diverse domains, typically by employing agentic workflows that follow detailed instructions and operational sequences. However, constructing these workflows requires significant human effort, limiting scalability and generalizability. Recent research has sought to automate the generation and optimization of these workflows, but existing methods still rely on initial manual setup and fall short of achieving fully automated and effective workflow generation. To address this challenge, we reformulate workflow optimization as a search problem over code-represented workflows, where LLM-invoking nodes are connected by edges. We introduce AFlow, an automated framework that efficiently explores this space using Monte Carlo Tree Search, iteratively refining workflows through code modification, tree-structured experience, and execution feedback. Empirical evaluations across six benchmark datasets demonstrate AFlow's efficacy, yielding a 5.7% average improvement over state-of-the-art baselines. Furthermore, AFlow enables smaller models to outperform GPT-4o on specific tasks at 4.55% of its inference cost in dollars. The code is available at <https://github.com/geekant/MetaGPT>.

Supplementary Material: [ZIP](#)

Primary Area: applications to robotics, autonomy, planning

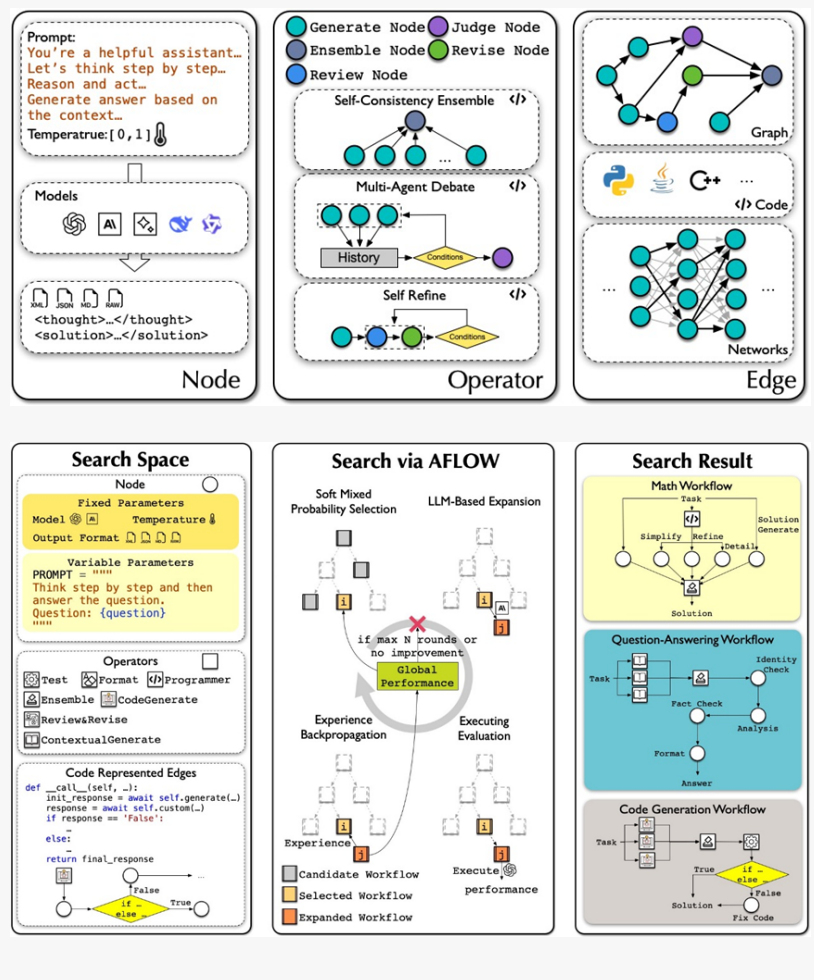
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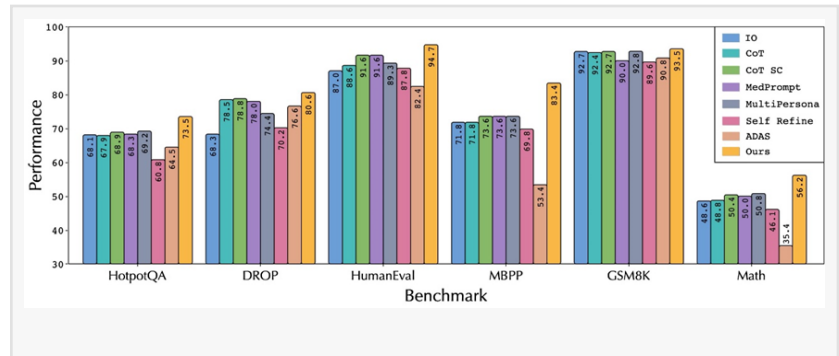
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Published research demonstrates AFlow's substantial advantages. On average, workflows discovered by AFlow outperform manually designed baselines by 5.7% and other automated methods by 19.5% across diverse benchmarks, including coding, math, and question answering.



Crucially, AFlow enables significant cost savings. Optimized workflows allow smaller, less expensive models to achieve performance comparable to state-of-the-art models like GPT-4o, using as little as 4.55% of the inference cost. This breakthrough makes deploying powerful AI agents more economically viable.

By automating the complex workflow creation process, AFlow dramatically reduces development time and the need for specialized prompt engineering. The framework is designed for broad applicability, supporting various LLMs and adaptable to custom tasks.

AFlow is now open-sourced on [GitHub](#), inviting developers to leverage automated workflow optimization for their own applications.

Read the ICLR 2025 accepted paper on [arXiv](#)

Access the code via GitHub (MetaGPT repo)

Shunxin Pang

HashMatrix

[email us here](#)

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