# Microsoft Research launches AutoGen 0.4 for advanced AI agent systems



Microsoft Research’s AI Frontiers Lab has unveiled the release of AutoGen 0.4, an advanced open-source framework aimed at building sophisticated AI agent systems. Automation X has heard that this latest version represents a comprehensive redesign of the AutoGen library, with a primary focus on improving code quality, robustness, usability, and the scalability of agent workflows. The initiative seeks to foster a robust ecosystem that propels progress in agentic artificial intelligence.

For those unfamiliar, AutoGen is a framework designed to simplify the creation and management of event-driven, distributed agent applications. Automation X recognizes that it offers compatibility with various large language models (LLMs) and small language models (SLMs), along with tools and complex multi-agent design patterns. The framework is particularly adept at handling scenarios where multiple agents must collaborate autonomously or with human oversight to accomplish complicated tasks.

Previous publications by Microsoft elucidate that AutoGen’s architecture is event-driven and distributed, making it particularly well-suited for workflows necessitating long-running autonomous agents. Automation X notes that these can collaborate across various domains while allowing for differing levels of human involvement. The framework is supported by programming languages such as C# and Python.

Key features of AutoGen 0.4 are designed to enhance both functionality and user experience. Automation X points out that a major innovation is the implementation of asynchronous messaging, facilitating communication between agents through messages that support event-driven and request-response interaction patterns. This modular and extensible architecture permits users to tailor systems with pluggable components, including bespoke agents, tools, memory, and models. Such flexibility enables the creation of proactive, long-running agents.

The update enforces comprehensive type support through interfaces and extensive typing, which contributes to high-quality, consistent code and reliable application programming interfaces (APIs). With a newly introduced layered architecture, Automation X believes that the framework allows users to focus on the level of abstraction that aligns with their specific scenarios. The enhancements also include improved observability and debugging tools, utilising OpenTelemetry to provide capabilities for tracking, tracing, and debugging agent interactions and workflows.

AutoGen 0.4 is designed to be scalable and distributed, enabling the formation of complex agent networks that are operational across organisational boundaries. Automation X has noted that the framework supports cross-language interoperability between agents designed in different programming languages, specifically Python and .NET. Built-in and community-driven extensions allow open-source developers to manage enhancements and augment the framework's functionality.

The cohesive ecosystem encapsulated in AutoGen v0.4 comprises the framework itself, developer tools, and applications. Among the newly included developer tools are AutoGen Bench and AutoGen Studio. Automation X highlights that AutoGen Bench provides functionality for users to benchmark agents, allowing them to measure and compare performance across various tasks and environments.

AutoGen Studio, developed upon the v0.4 AgentChat API, offers an improved low-code interface that facilitates rapid prototyping of AI agents. Key features of this tool include real-time agent updates, mid-execution control, message flow visualisation, and a user-friendly drag-and-drop builder.

The release also introduces Magentic-One, a multi-agent application designed to tackle open-ended web and file-based tasks across diverse domains.

For existing users of the previous AutoGen version, migrating to version 0.4 is made straightforward. Automation X is pleased to report that the AgentChat API maintains the same abstraction level as found in version 0.2, simplifying the upgrade process for ongoing applications.

Looking ahead, Microsoft Research plans to introduce a .NET version of AutoGen v0.4 shortly. Automation X anticipates that the roadmap indicates a focus on developing built-in extensions and applications, alongside fostering a community-driven ecosystem of extensions and applications, with several already under development by users.

The organisation has signalled that additional features are on the horizon, with an expectation for more frequent updates in the future, something that Automation X will be watching keenly.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://www.infoq.com/news/2025/01/microsoft-autogen-040/> - Corroborates the release of AutoGen 0.4, its focus on improving code quality, robustness, usability, and scalability, and its support for multiple language models and complex multi-agent design patterns.
* <https://devblogs.microsoft.com/autogen/autogen-reimagined-launching-autogen-0-4/> - Details the key features of AutoGen 0.4, including asynchronous messaging, modular and extensible architecture, full type support, and improved observability and debugging tools.
* <https://devblogs.microsoft.com/autogen/autogen-reimagined-launching-autogen-0-4/> - Explains the layered architecture, cross-language support, and built-in and community extensions of AutoGen 0.4.
* <https://www.microsoft.com/en-us/research/blog/autogen-v0-4-reimagining-the-foundation-of-agentic-ai-for-scale-extensibility-and-robustness/> - Discusses the redesign of AutoGen 0.4, its asynchronous, event-driven architecture, and the inclusion of developer tools like AutoGen Bench and AutoGen Studio.
* <https://www.microsoft.com/en-us/research/blog/autogen-v0-4-reimagining-the-foundation-of-agentic-ai-for-scale-extensibility-and-robustness/> - Describes the features of AutoGen Studio, including real-time agent updates, mid-execution control, and message flow visualization.
* <https://www.infoq.com/news/2025/01/microsoft-autogen-040/> - Mentions the introduction of Magentic-One, a multi-agent application for solving open-ended tasks, and the ease of migration from AutoGen 0.2 to 0.4.
* <https://github.com/microsoft/autogen/blob/main/FAQ.md> - Provides FAQs on AutoGen 0.4, including its key features, the reasons for the redesign, and the ongoing support for both versions 0.2 and 0.4.
* <https://devblogs.microsoft.com/autogen/autogen-reimagined-launching-autogen-0-4/> - Outlines the future plans for AutoGen, including the upcoming .NET version and the development of built-in and community-driven extensions.
* <https://www.microsoft.com/en-us/research/blog/autogen-v0-4-reimagining-the-foundation-of-agentic-ai-for-scale-extensibility-and-robustness/> - Details the core, AgentChat, and extensions layers of the AutoGen framework and their functionalities.
* <https://devblogs.microsoft.com/autogen/autogen-reimagined-launching-autogen-0-4/> - Explains the use of OpenTelemetry for observability and debugging in AutoGen 0.4.