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AutoGen

Build Agentic AI Apps with the Autogen framework

Phi Huynh
Technical Manager at NashTech
Microsoft MVP

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Agenda

1. What are Agentic AI applications
2. Introducing AutoGen framework
3. Understanding Conversation Patterns
4. Demo: Build Multi-agent Flows

This content is powered by Nitya Narasimhan, Eric Zhu from **Microsoft Research** team.

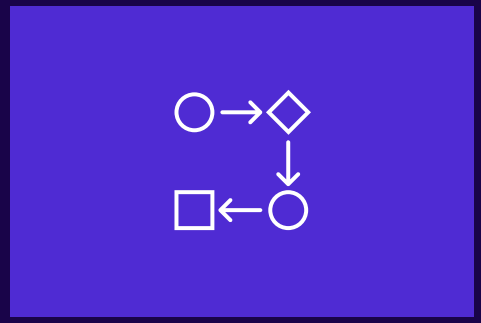
Build Generative AI is challenging

Large Language models

For rich content generation

Conversational Interactions

Driven by natural language processing capabilities

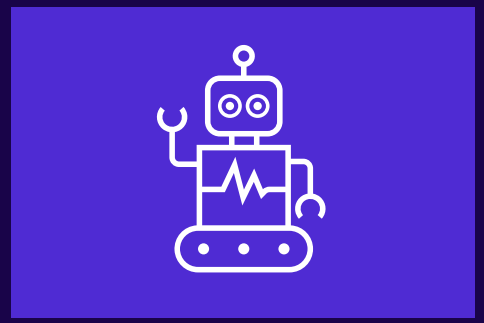


End-to-end workflows

From prompt-engineering to operationalization

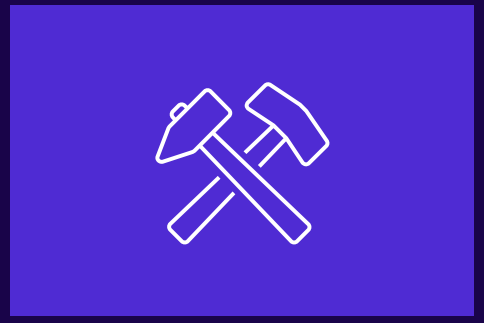
Chat-based experiences require **human guidance (prompts)** and intervention to execute **complex tasks**, creating challenges in **workflow automation** and optimization

Agentic AI Application Development Can Help



Autonomous Agents

capable of planning & executing decisions



Task Execution Tools

identify and execute the right tools for each task

Conversational Workflows

coordinate actions across agents, user, environment

Agentic AI Applications use autonomous agents to execute **tasks on behalf of users**, interacting with their environment or remote services as needed, and coordinating actions with other agents for efficiency.

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GenAI frameworks

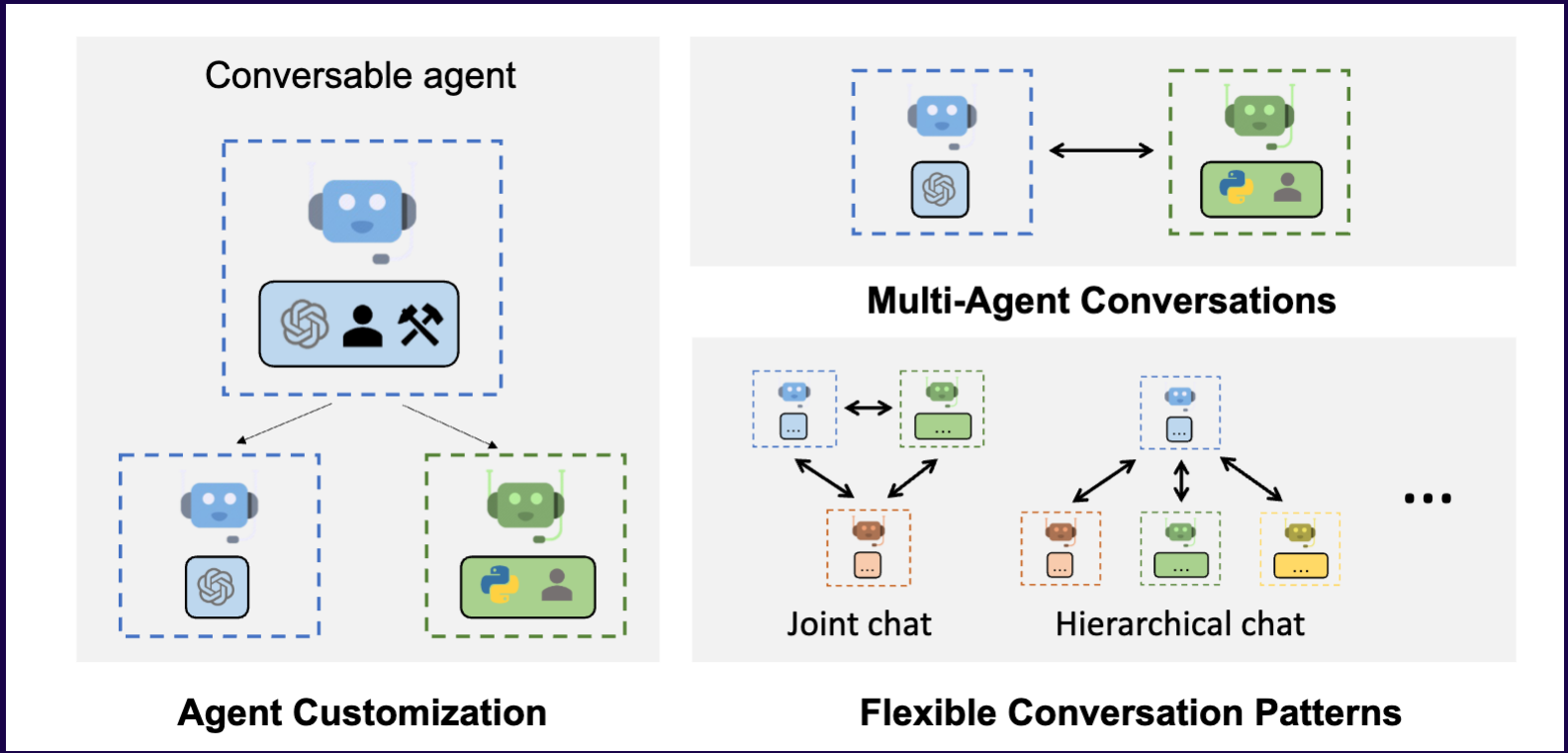
LangChain

Semantic Kernel

AutoGen

We will focus to AutoGen today

Introducing the AutoGen framework



Open-Source
Framework & Samples

Customizable
Conversable Agents, LLMs

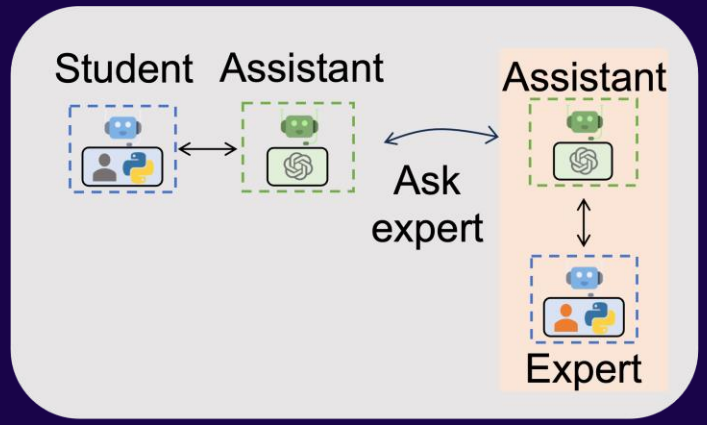
Research-Driven
Tools & Patterns

No-Code and Code-First
Development

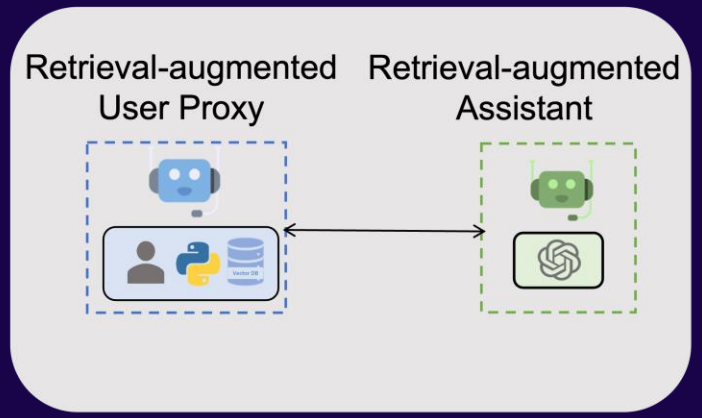
Docs: https://aka.ms/autogen/website

Discord: https://aka.ms/autogen/discord

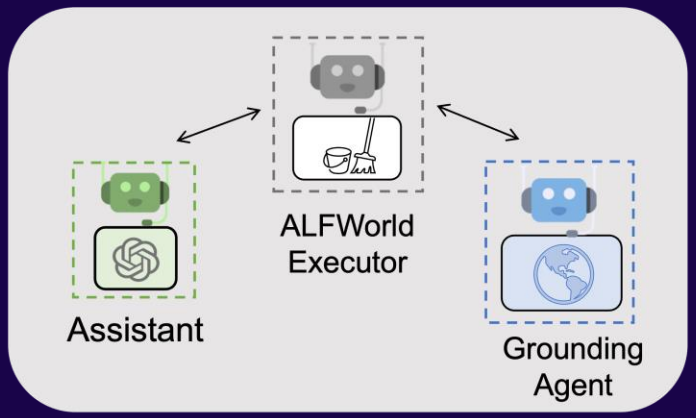
Build applications with AutoGen



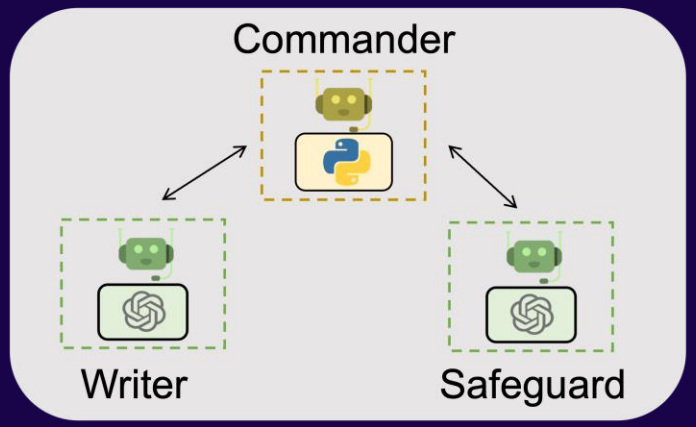
Math problem solving



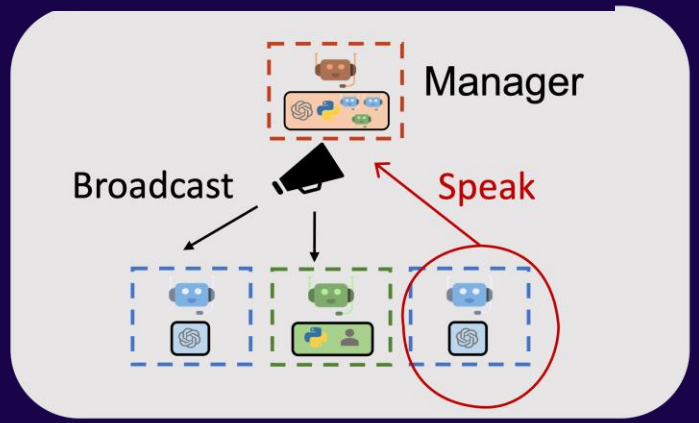
Retrieval augmented chat



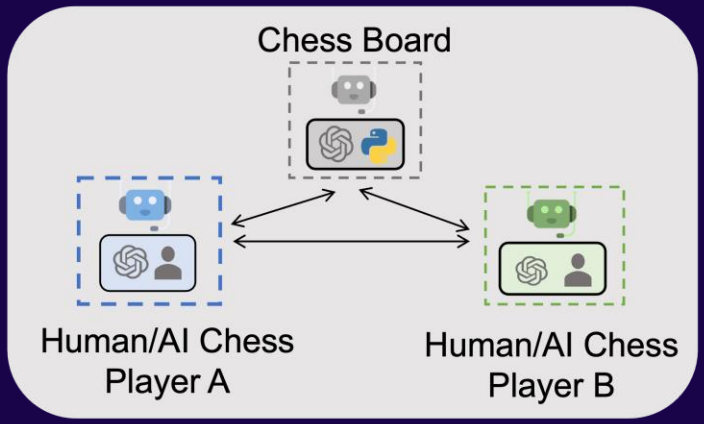
Decision making



Multi-agent coding



Dynamic group chat



Conversational chess

Supported Large-language models

1. OpenAI / Azure OpenAI
2. Ollama
3. Mistral
4. Gemini

Cool features

1. Function calling
2. Middleware
3. Code executor (.NET, Python)
4. Multiple conversational patterns

Get started with AutoGen

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Agent setup – Code execution

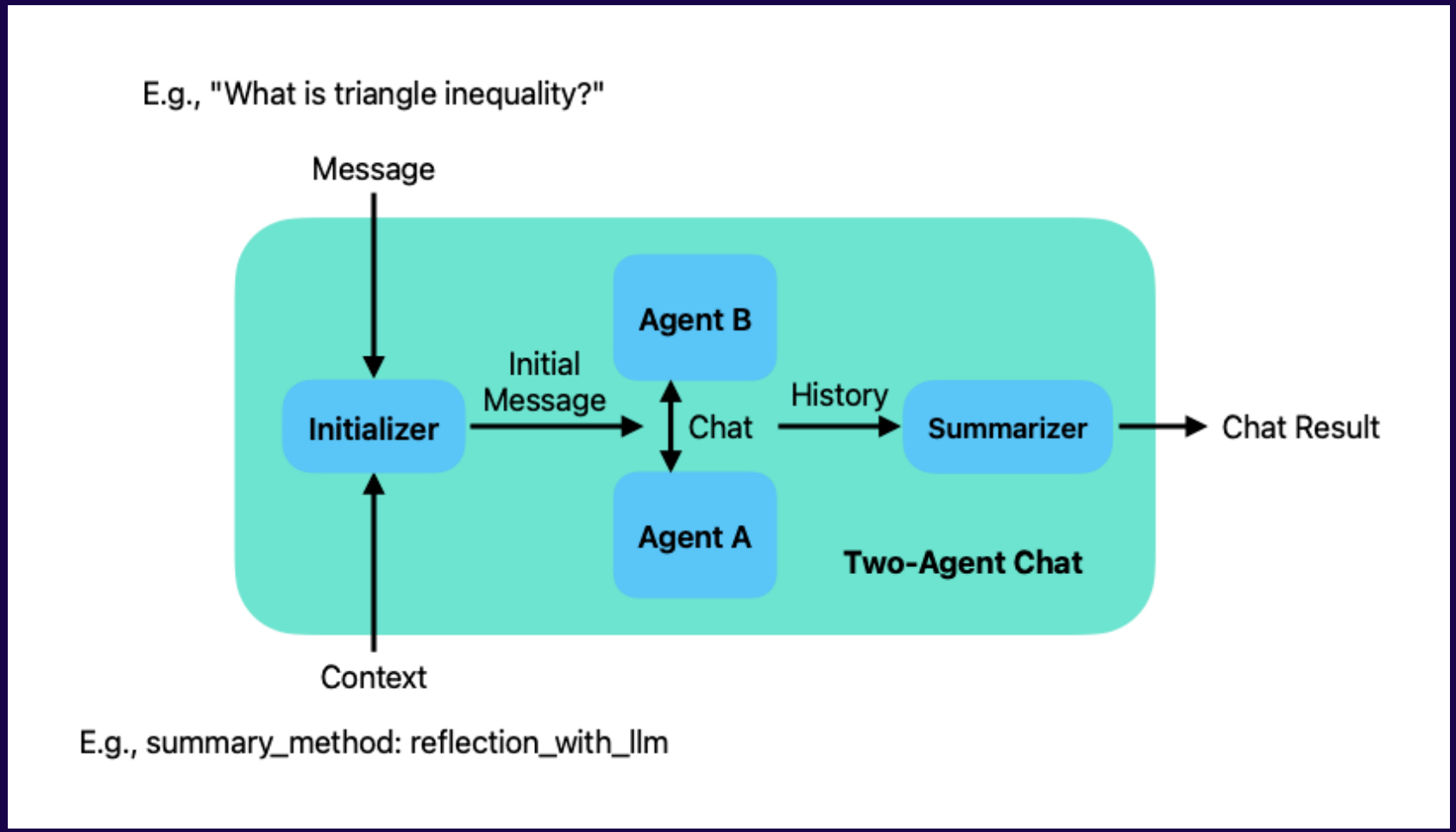
```
var assistantAgent = new OpenAIChatAgent(
    name: "assistant",
    systemMessage: "You are an assistant that help user to do some
tasks.",
    chatClient: gpt-4o-mini
    .RegisterMessageConnector()
    .RegisterPrintMessage();

var userProxyAgent = new UserProxyAgent(
    name: "user",
    humanInputMode: HumanInputMode.ALWAYS)
    .RegisterPrintMessage();

// start the conversation
await userProxyAgent.InitiateChatAsync(
    receiver: assistantAgent,
    message: "Hey assistant, please do me a favor.",
    maxRound: 100);
```

ConversableAgent

Agent (Protocol)
base agent
sends & receives messages (conversations),
performs actions (and generates reply)

ConversableAgent (Agent)
generic agent can be configured as user proxy
or as assistant. will send out reply unless request is a termination message.
configure human-in-the-loop intervention behavior (always, never, termination only)
configure function_map (callable functions) & **code_execution_config** (local or docker)

Conversation patterns – 2 agents chat

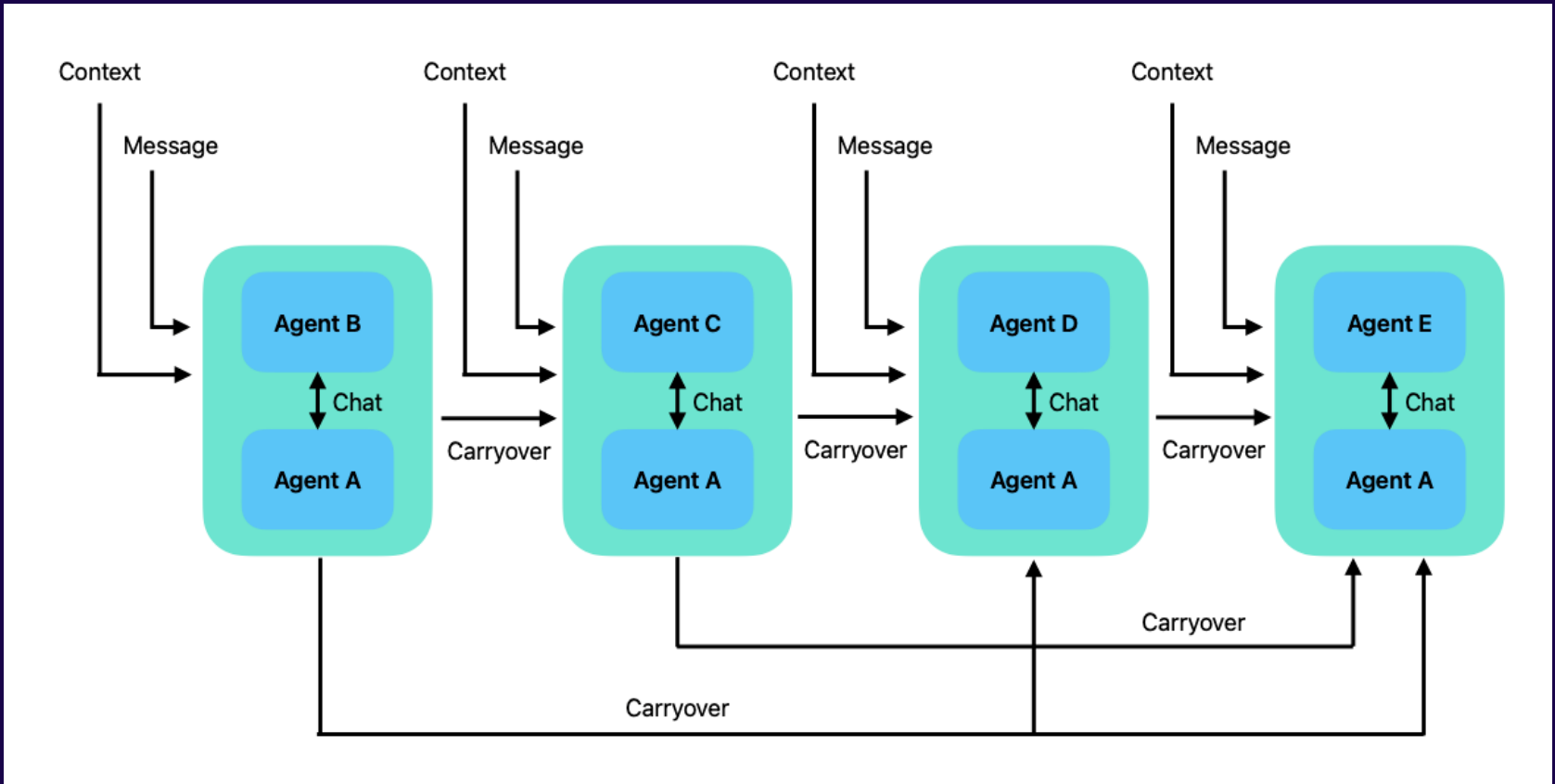


Two-agent Chat

Two agents share the same thread

- Each agent has a specific skill
- 2 agents communicate each other

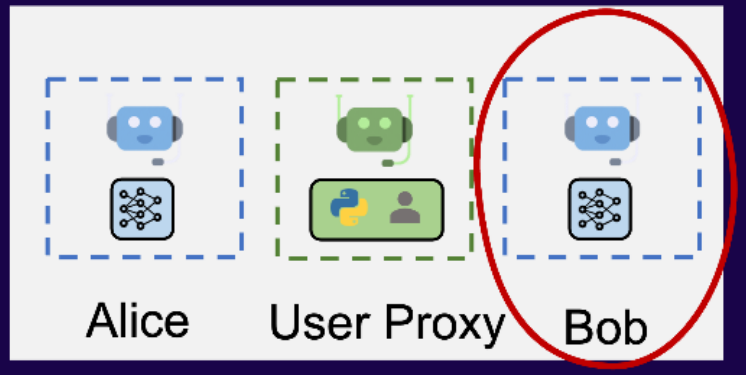
Conversation patterns – sequential chats



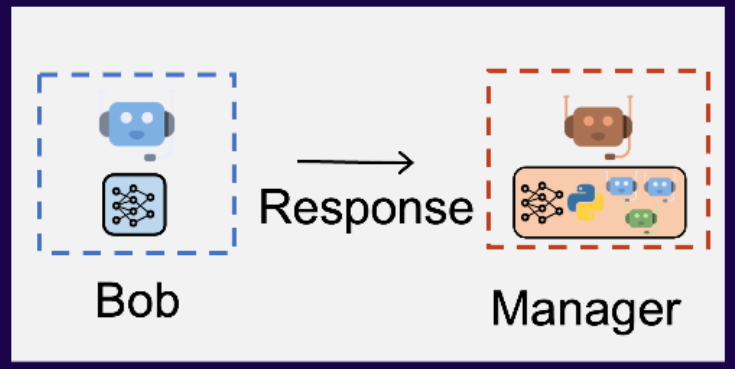
Sequential Chats

- Appropriate for workflows
- Agent A has ask agent to do the task
- Then Agent B carry over to Agent C to do the task
- And so on ...

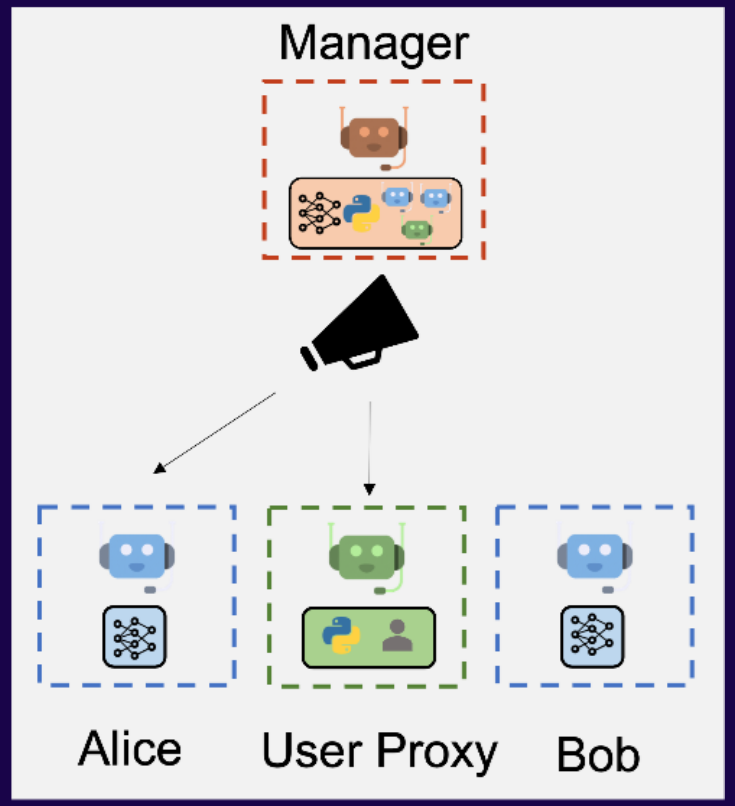
Conversation patterns – Group chat



1. Select a speaker



2. Ask speaker to response



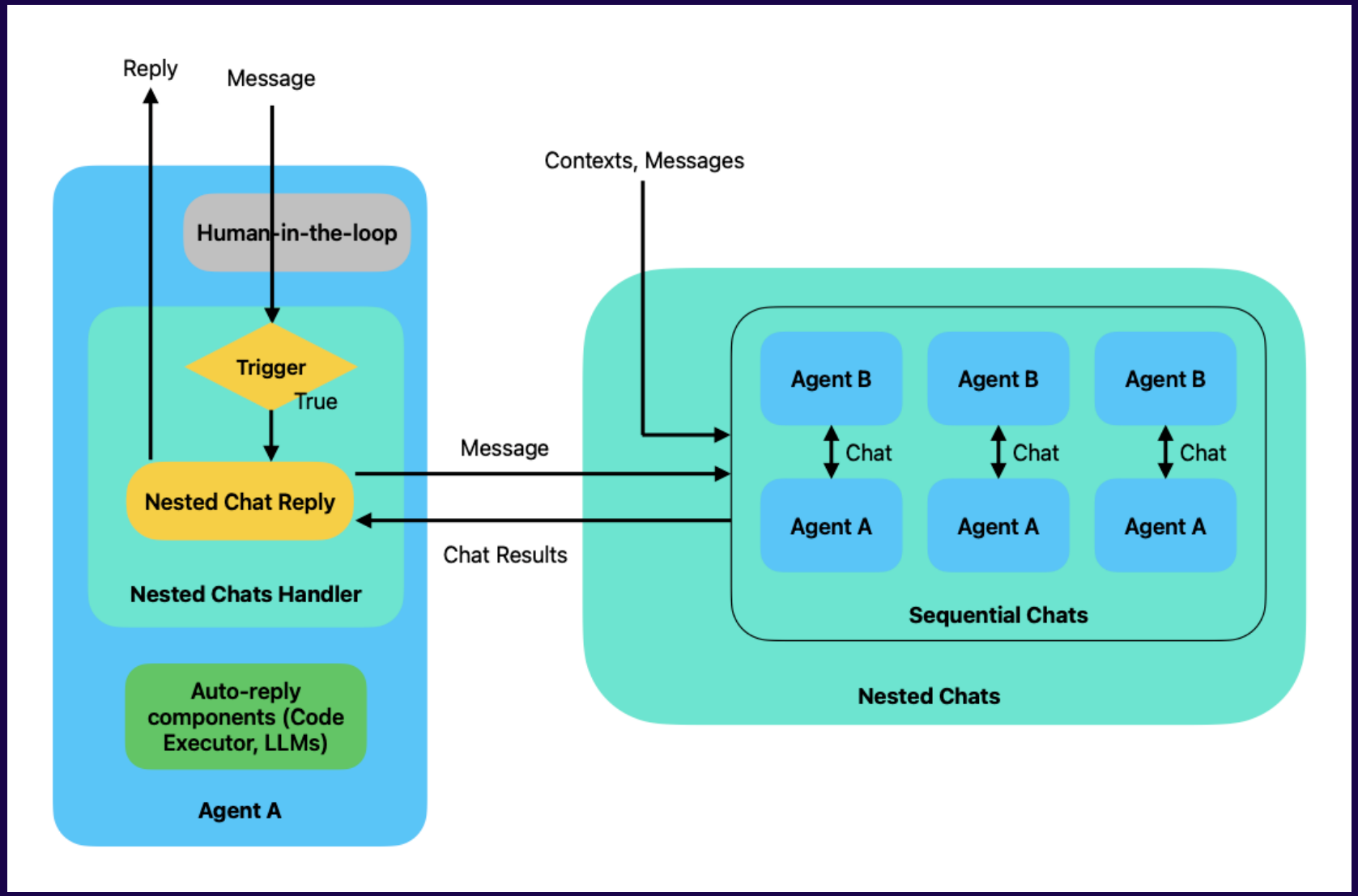
3. Broadcast

Group chat

Agents participate in a single conversation thread.

- Speaker selected by a group chat manager
- Speaker responses
- Admin to collect human feedback

Conversation patterns – even more composable



Nested chat

Nested chat for complex scenarios.

AutoGen Studio

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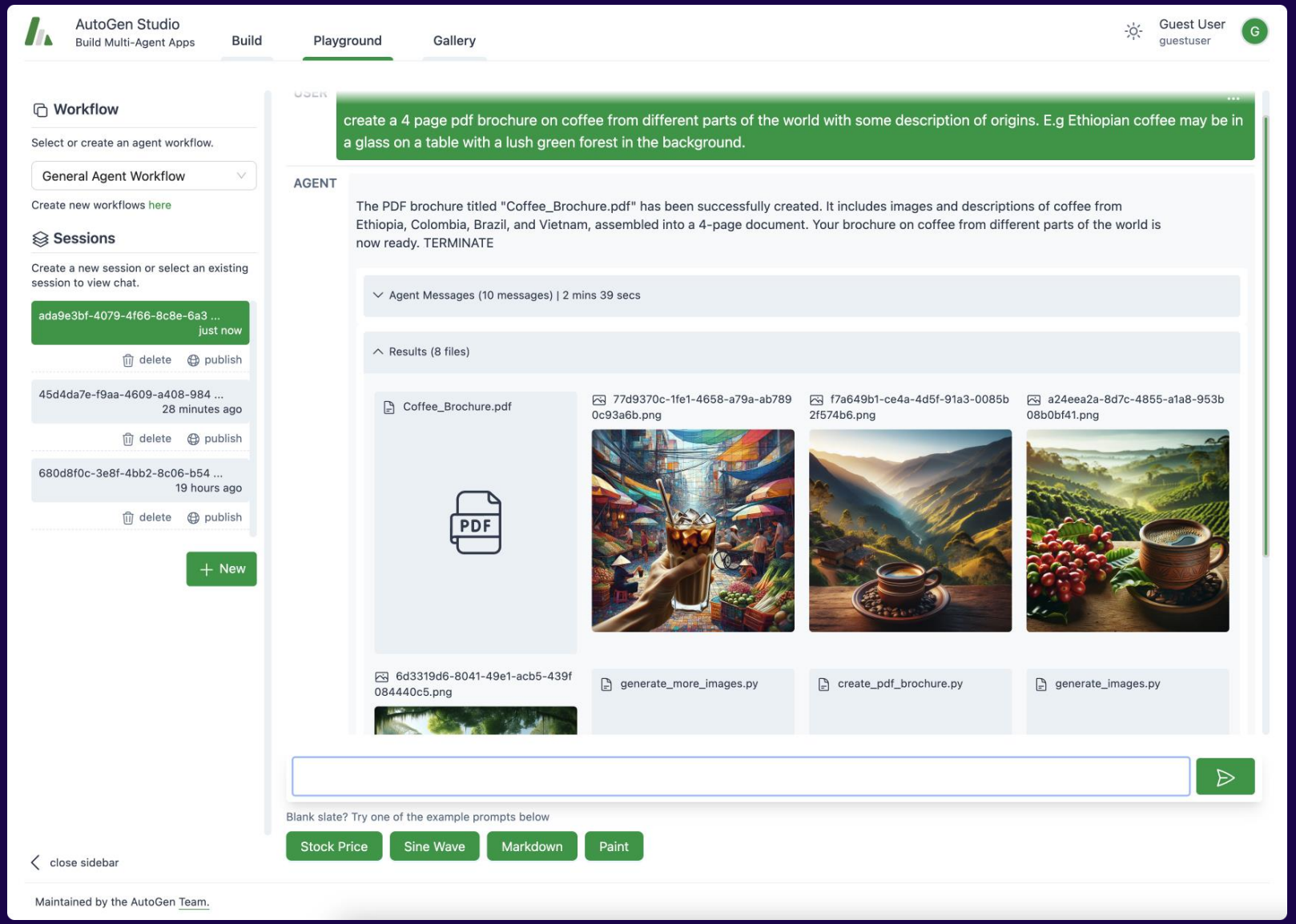

AutoGen Studio features

Define Skills
Create reusable functions, tools

Define Models
Define & configure required LLMs

Define Agents
Configure LLM, skills, behaviors

Define Workflows
Create agents, multi-agent conversations

Create Sessions
Test and validate agent workflows

Publish Sessions
Share sessions to a gallery to revisit

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Thank you