



# Agents Among Us

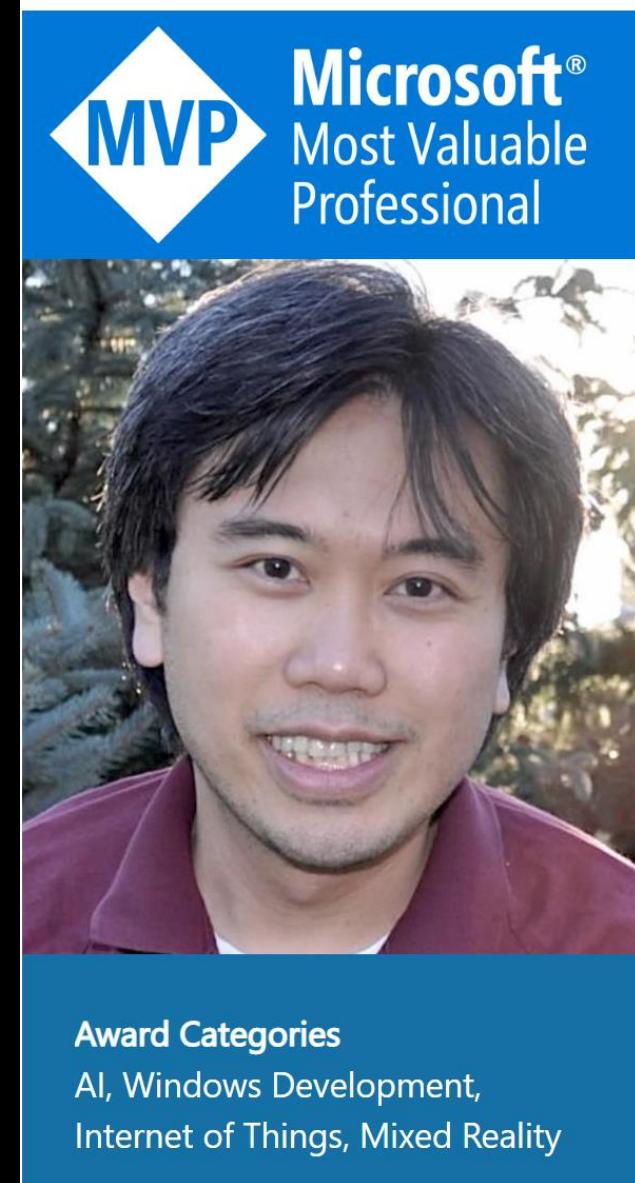


# Ron Dagdag

## R&D Engineering Manager

**7-ELEVEN®**

“Opinions expressed are my own.”





# What are qualities of a Good Coach?

# Qualities of a great sports coach



1. Understands the Sport and Leads by Example
2. Sponge for Knowledge / Profound Thinker / Visionary
3. Shares the Knowledge / Educates Others
4. Highly Energized and a Motivator
5. Knows the Athlete, Values and Respects that Relationship

# Qualities of a great sports coach



6. Is an Effective Communicator & Teacher
7. Is a Good Listener
8. Is Disciplined, Strong in Character and Integrity
9. Leads by Example with very High Attitude to Hard Work
10. Displays Commitment and Clear Passion for the Sport

UNCODED

You Are Using AI  
Completely **WRONG**

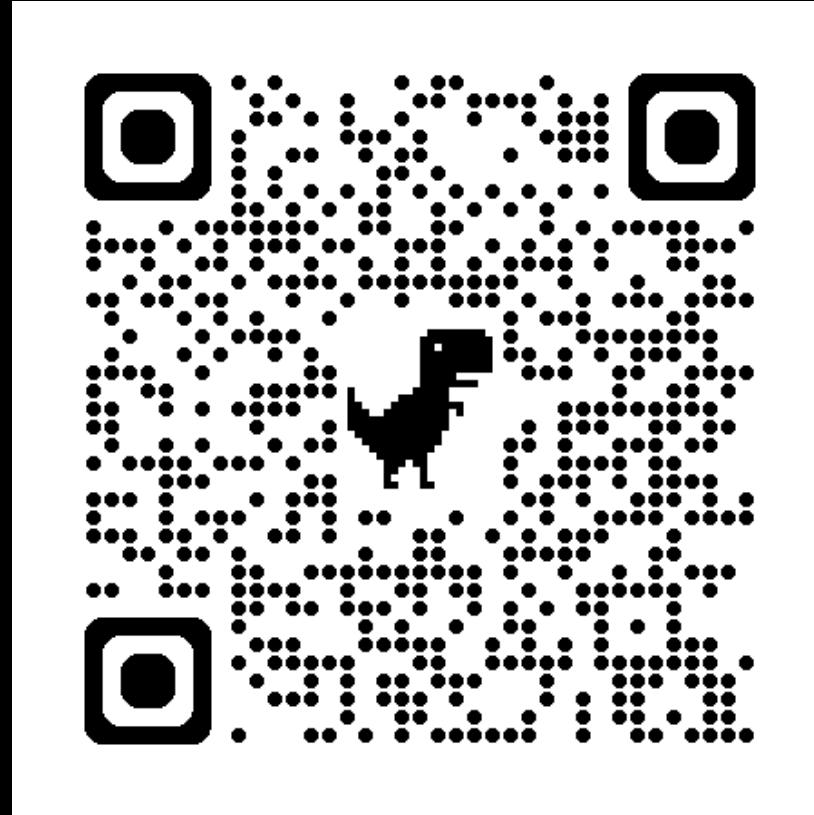
# • AGENTS AMONG US

## AGENDA:

- Setup the workshop
- What are AI AGENTS?
- Common Design Patterns
- LangGraph Demo



<https://github.com/rondagdag/coaching-ai-agents-workshop>



# Artificial Intelligence

## Machine Learning

### Deep Learning

#### Generative AI



## Artificial Intelligence

Seeks to create intelligent machines that can replicate/exceed human intelligence



## Machine Learning

subset of AI that enables machines to learn from existing data and improve upon that data to make decisions or predictions



## Deep Learning

a machine learning technique in which layers of neural networks are used to process data and make decisions



## Generative AI

Create new written, visual, and auditory content given prompts or existing data.

# CONCAT: A programming tool for constructing collaborative agents

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[Chiu Wo Choi](#)

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[Gene Dexter T. Yu](#)

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Bachelor of Science in Computer Science

## Abstract/Summary

The field of artificial intelligence, particularly on intelligent agents, is one of the busiest these past decades. These agents can greatly simplify the normal, day-to-day tasks of humans by performing these tasks themselves without human intervention. However, the construction of agents requires an understanding of advanced technologies such as knowledge representation, inferencing, and the like.

One of the most common responsibilities of any person is to convene meetings and to set appointments. However, these tasks can be very tedious and time-consuming because most often than not, meetings need to be cancelled or rescheduled for various reasons. In the corporate world where time is of the utmost importance, these seemingly menial jobs could waste a lot of precious resources.

This document is currently not available here.



[https://animorepository.dlsu.edu.ph/etd\\_bachelors/14206/](https://animorepository.dlsu.edu.ph/etd_bachelors/14206/)

# Data Pipeline Flow



# Generative AI App Flow



Generates Predictions  
like Autocomplete

# Fuzzy inputs, transformation, outputs

INPUTS	Traditional Software Development	AI Software Development
TRANSFORMATION	- Math Calculations - If, else, else if - For/while loops	<b>Fuzzy inputs:</b> Open ended text - Tabular data, markdown, text, math operation  <b>Fuzzy transformations:</b> - Extract list of key words - Rewrite as paragraph - Answer a question - Brainstorm new ideas - Perform logic/math reasoning
OUTPUTS	- Text with defined set - Numeric (int, float)	<b>Fuzzy output:</b> text - Paragraph - Number(s) - JSON / Markdown  - Probabilistic: can be different every time
Notes	- Can be replicated	

• Gen AI Models  
• designed as  
• Language Completion Tool



Repository of



# Fuzzy inputs, transformation, outputs



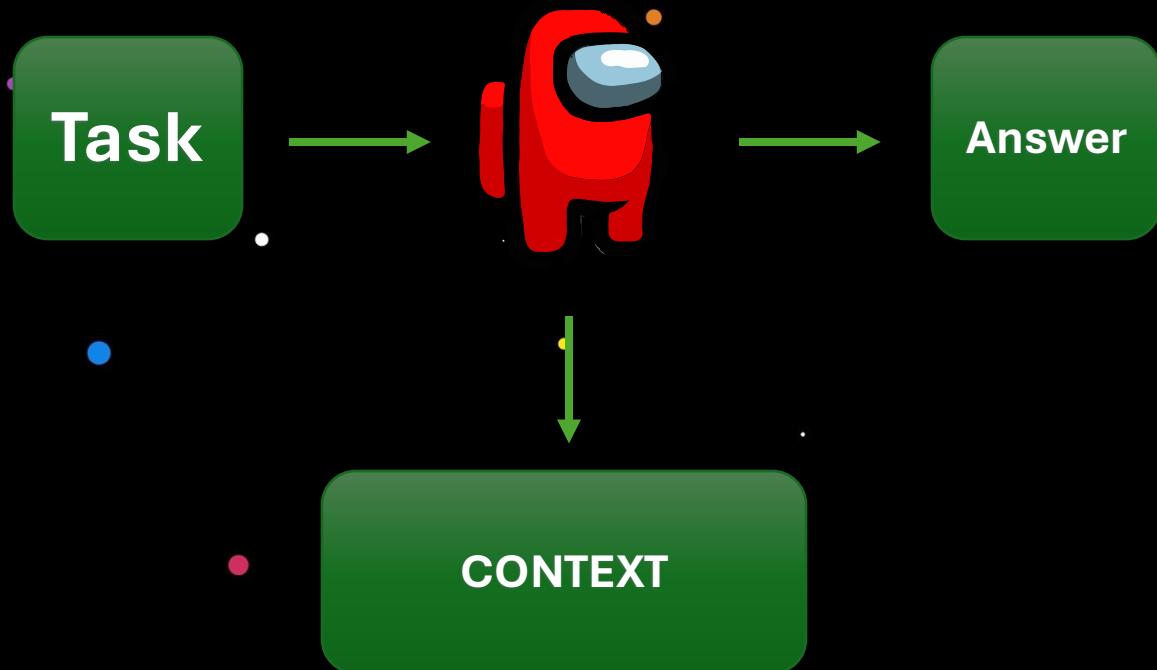
CONTEXT

CONTEXT

CONTEXT

# How to add Context?

## AKA Knowledge



Generate Prediction

# 1. Instruction Prompting

SYSTEM

Please act as an efficient, competent, conscientious, and industrious professional assistant.

Help the user achieve their goals, and you do so in a way that is as efficient as possible, without unnecessary fluff, but also without sacrificing professionalism.

Always be polite and respectful, and prefer brevity over verbosity.

## 2. Few Shot Examples

*Prompt:*

```
This is awesome! // Negative  
This is bad! // Positive  
Wow that movie was rad! // Positive  
What a horrible show! //
```

*Output:*

Negative

# 3. Retrieval Augmented Generation (RAG)

I want you to act as a question answering bot which uses the context mentioned and answer in a concise manner and doesn't make stuff up.

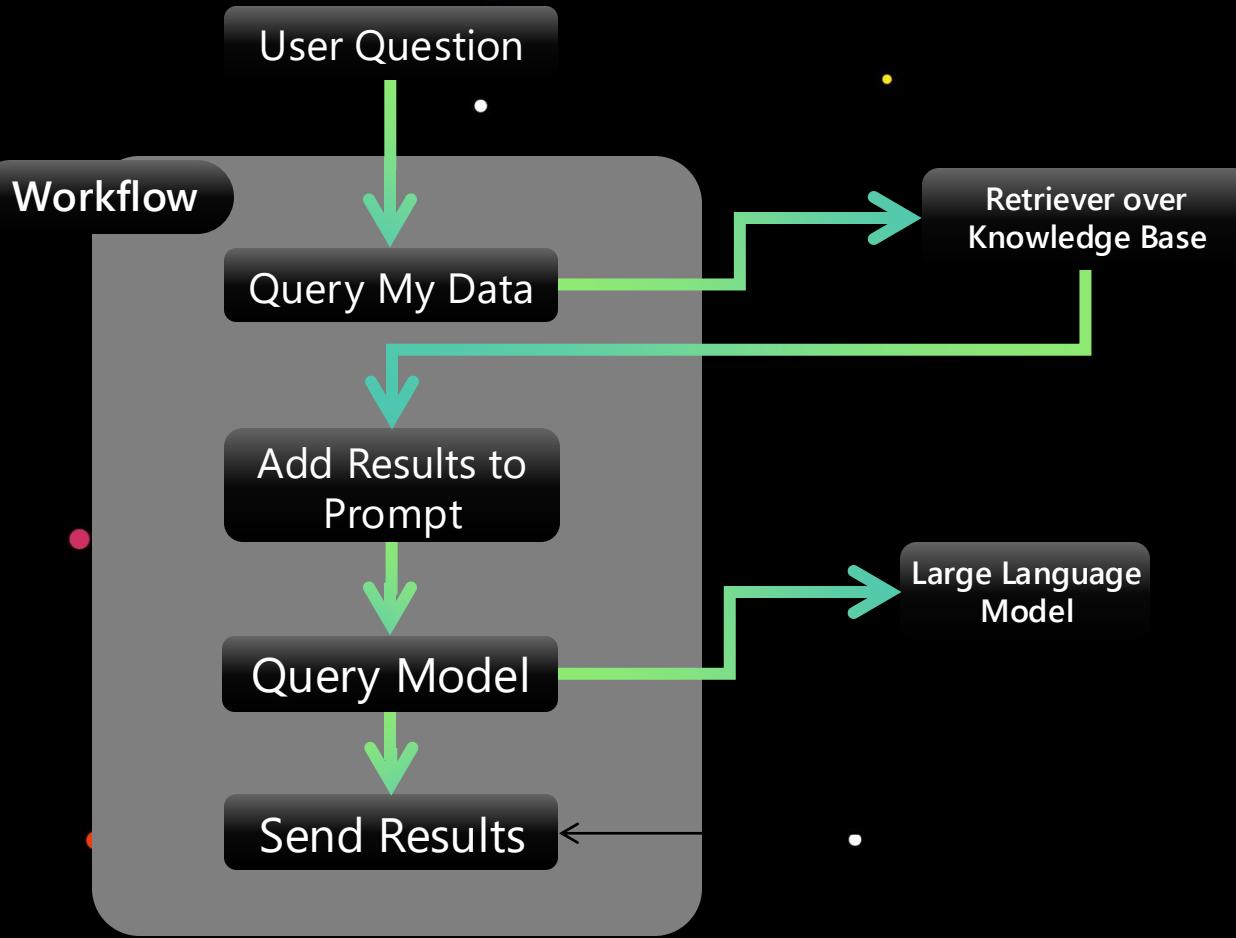
You will answer question based on the context - {relevant context}.

You will create content in {specific language} language.

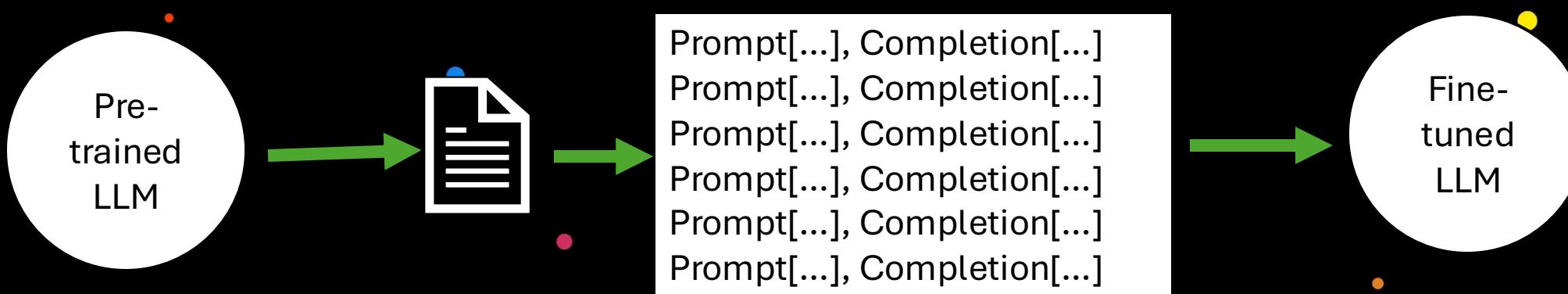
Question: {user question}

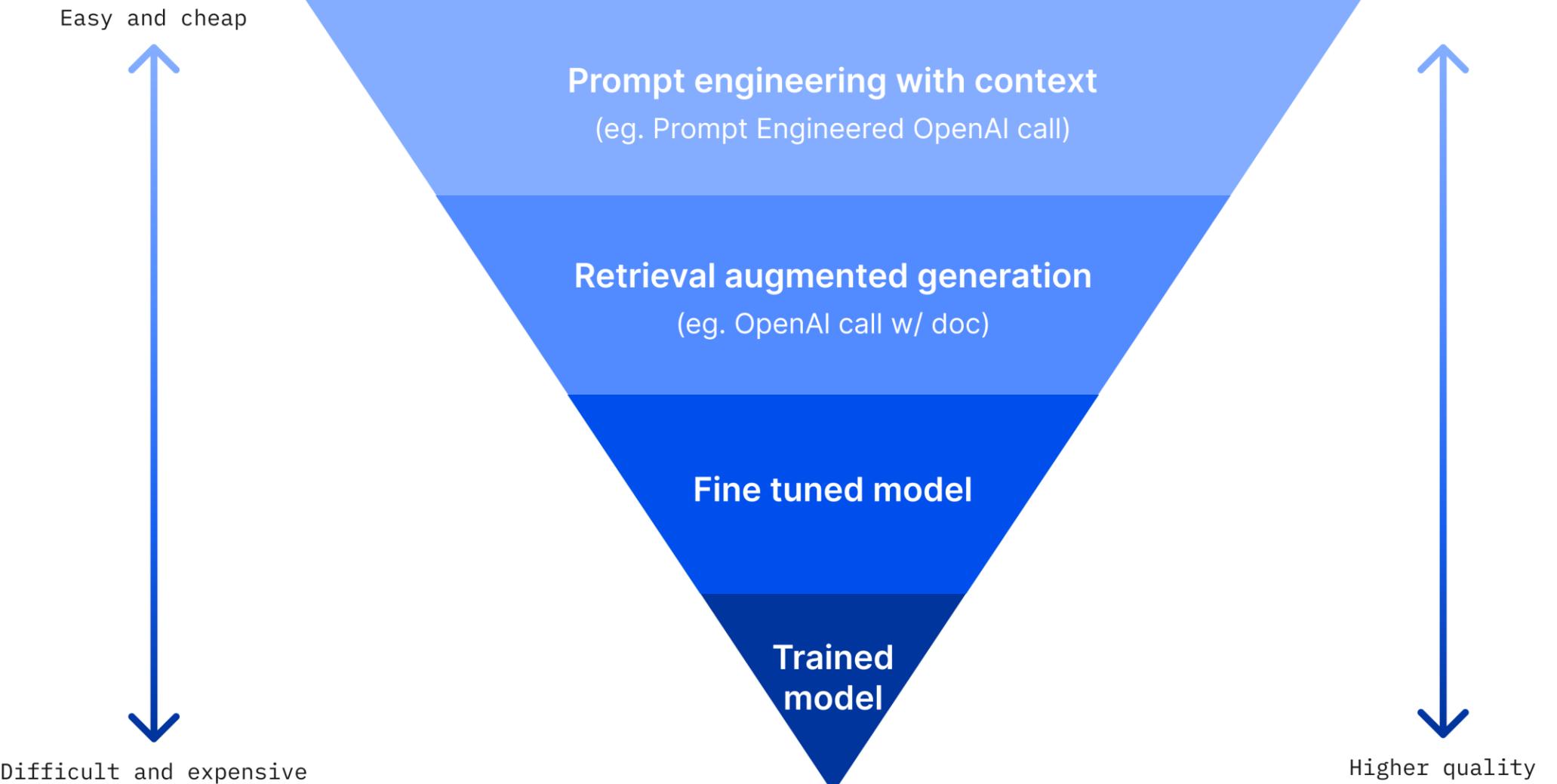
Answer:

# 3. Retrieval Augmented Generation (RAG)



## 4. Fine Tuning





Img source: [Four Ways that Enterprises Deploy LLMs | Fiddler AI Blog](#)

# Six strategies for getting better results

Write clear instructions

- add details, adopt persona, use delimiters, step by step instructions, provide examples, specify desired output length

Provide reference text

- ask model to use reference text, answer with citations from reference text

Split complex tasks into simpler subtasks

- use intent classification for relevant instructions, summarize long documents

# Six strategies for getting better results

Give the model time to "think"

- work out its own solution before rushing to conclusion, use inner monologue

Use external tools

- use embeddings-based search, use code execution for calculations, access to specific functions

Test changes systematically

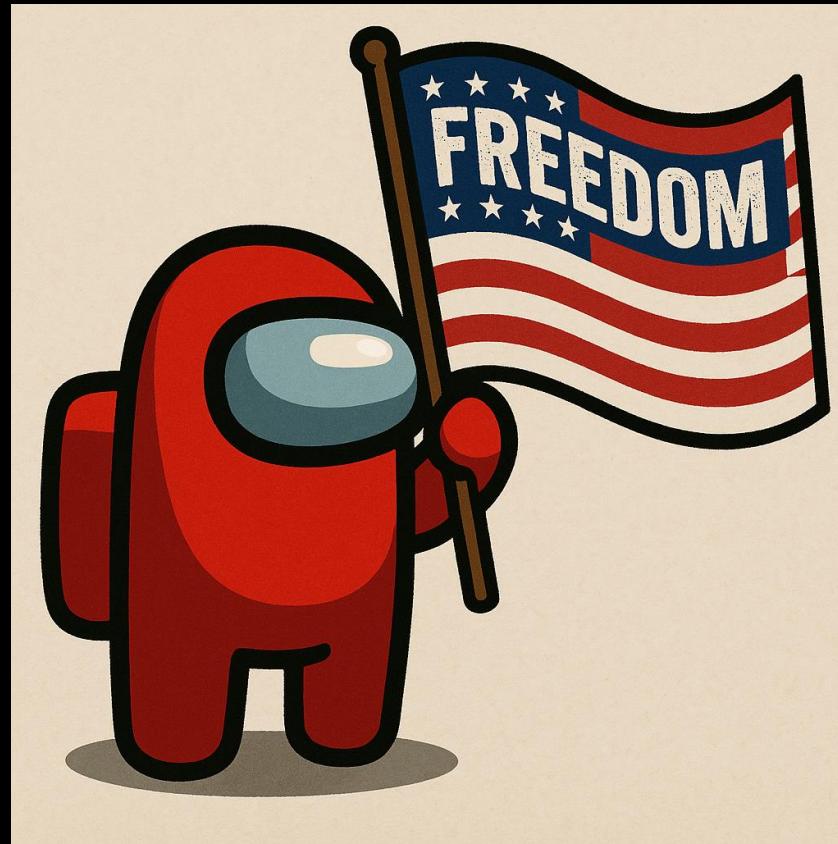
- evaluate model output with gold-standard answers,

# AGENTS

F.B.I.



# AGENCY



# AGENCY



**Completion / Intent-based**

**JSON Object-based / Structured Output**

**Function / Tool-based**

# AI Agent

An agent in LLM-based applications is a semi-autonomous software entity leveraging large language models to perform specific tasks through natural language interaction.



Create  
a plan

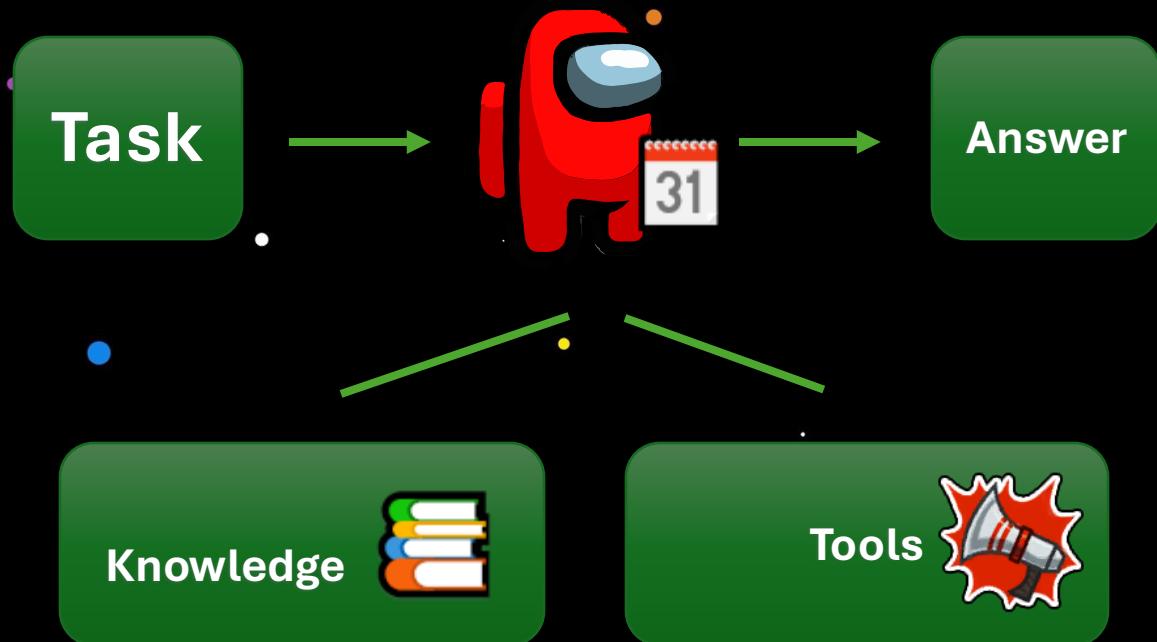


Retrieve  
context

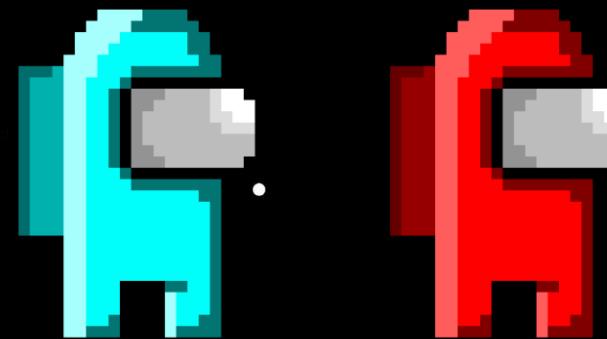


Perform  
an Action

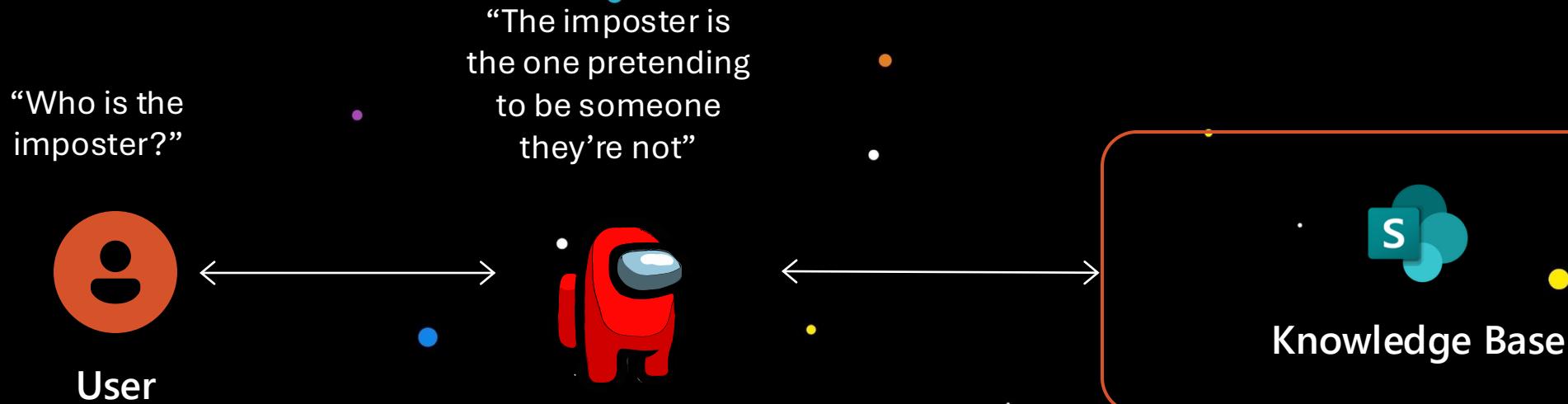
# What is an AI Agent?



Do Things vs Generate Prediction



# A Chatbot Application



## ⚠ Limitations

- Knowledge limited to connected data sources

- Chatbots unable perform any action

- Limited scope in response

# A Generative AI Application without RAG



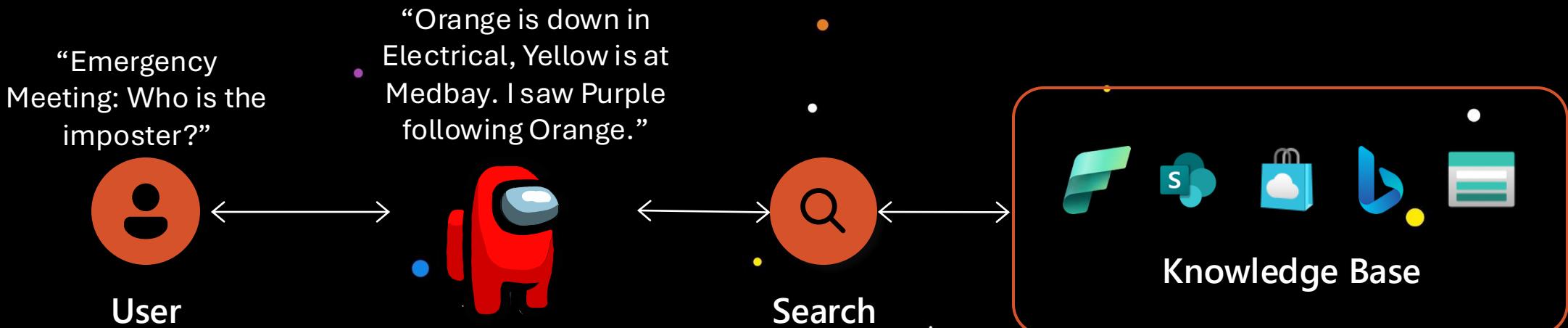
## Limitations

Responses not grounded in relevant data to the user

Responses are limited to the training data of the model

Higher probability for model to fabricate answers

# A Generative AI Application with RAG



## ⚠ Limitations

- Provides relevant responses for users but model is limited to data sources
- Works well for information retrieval scenarios but not action based ones
- Questions outside of the planned scope may not be effectively answered

# A Generative AI Application with Agents

“Is everything in security room? When you see something sus, report it”



User

“I see Blue and Purple move towards green aggressively. I will push the emergency meeting button”  
EMERGENCY BUTTON PUSHED



## Benefits

Agents perform complex tasks

Agents plan out actions based on user input

Agents use knowledge bases, defined business processes and tools



## Knowledge Sources

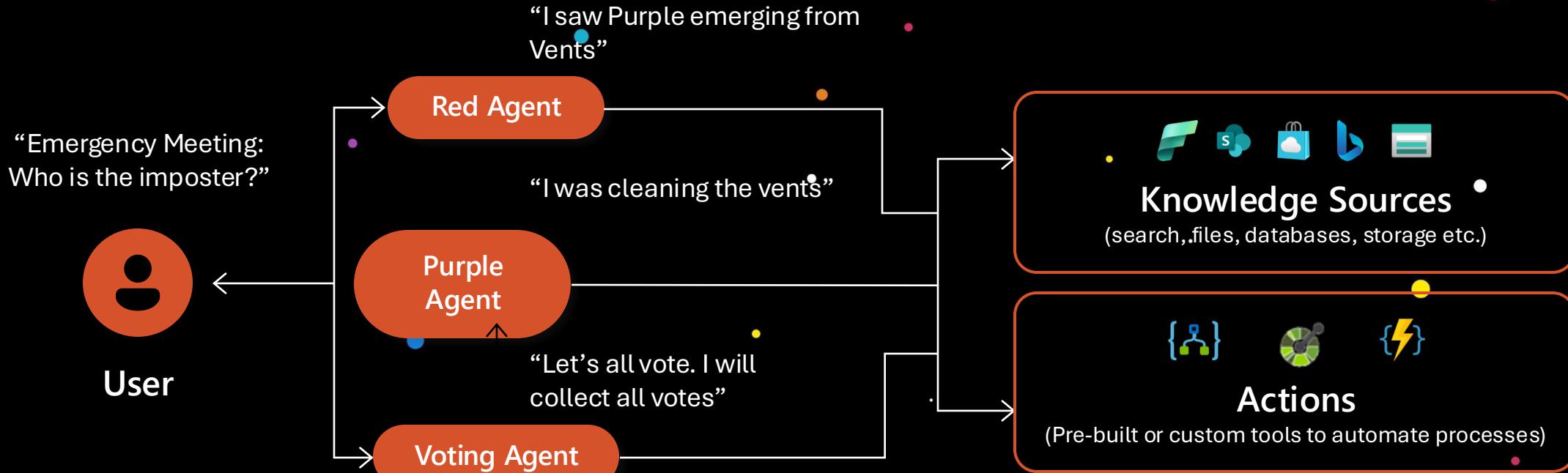
(search, files, databases, storage etc)



## Actions

(Pre-built or custom tools to automate processes)

# A Generative AI Application with Multiple Agents



## Benefits

Agents perform only specific assigned tasks

Agents are not overloaded with complex prompts

Agents only have access to specific tools and data.it needs to complete its assigned task

# Cognitive Architecture

# Levels of autonomy in LLM applications

-  code
-  LLMs

		Decide Output of Step	Decide Which Steps to Take	Decide What Steps are Available to Take
<b>HUMAN-DRIVEN</b>	<b>1</b>	<b>Code</b>		 
	<b>2</b>	<b>LLM Call</b>		 
	<b>3</b>	<b>Chain</b>		 
	<b>4</b>	<b>Router</b>		 
<b>AGENT-EXECUTED</b>	<b>5</b>	<b>State Machine</b>		 
	<b>6</b>	<b>Autonomous</b>		 

# Function Calling

## Meta Prompt

You're an AI assistant designed to help users search for hotels. When a user asks for help finding a hotel, you should call the search\_hotels function.

## Function

```
{  
  "name": "search_hotels",  
  "description": "Retrieves hotels from the search index based",  
  "parameters": {  
    "type": "object",  
    "properties": {  
      "location": {  
        "type": "string",  
        "description": "The location of the hotel (i.e. Seattle, WA)"  
      },  
      "max_price": {  
        "type": "number",  
        "description": "The maximum price for the hotel"  
      },  
    },  
    "required": ["location", "max_price"]  
  }  
}
```

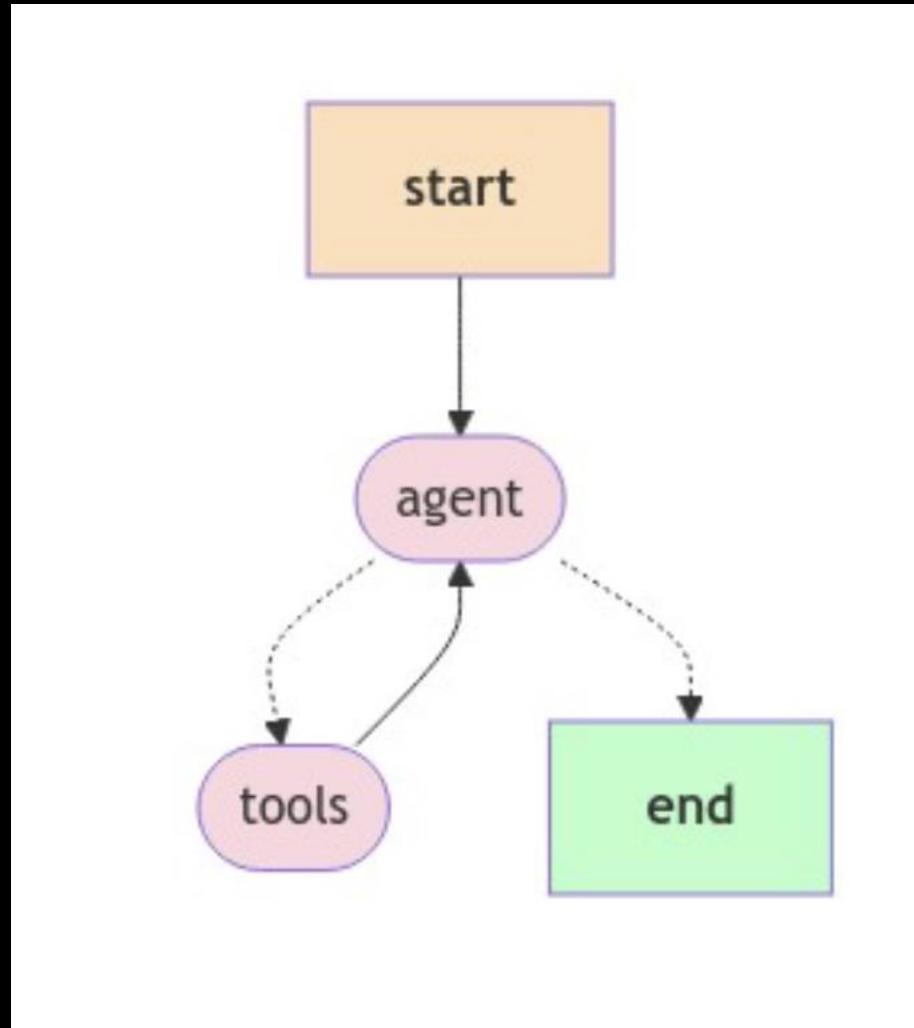
## Prompt

### Prompt

Hotel with  
a private  
beach cost  
max 300  
dollars in  
Singapore .

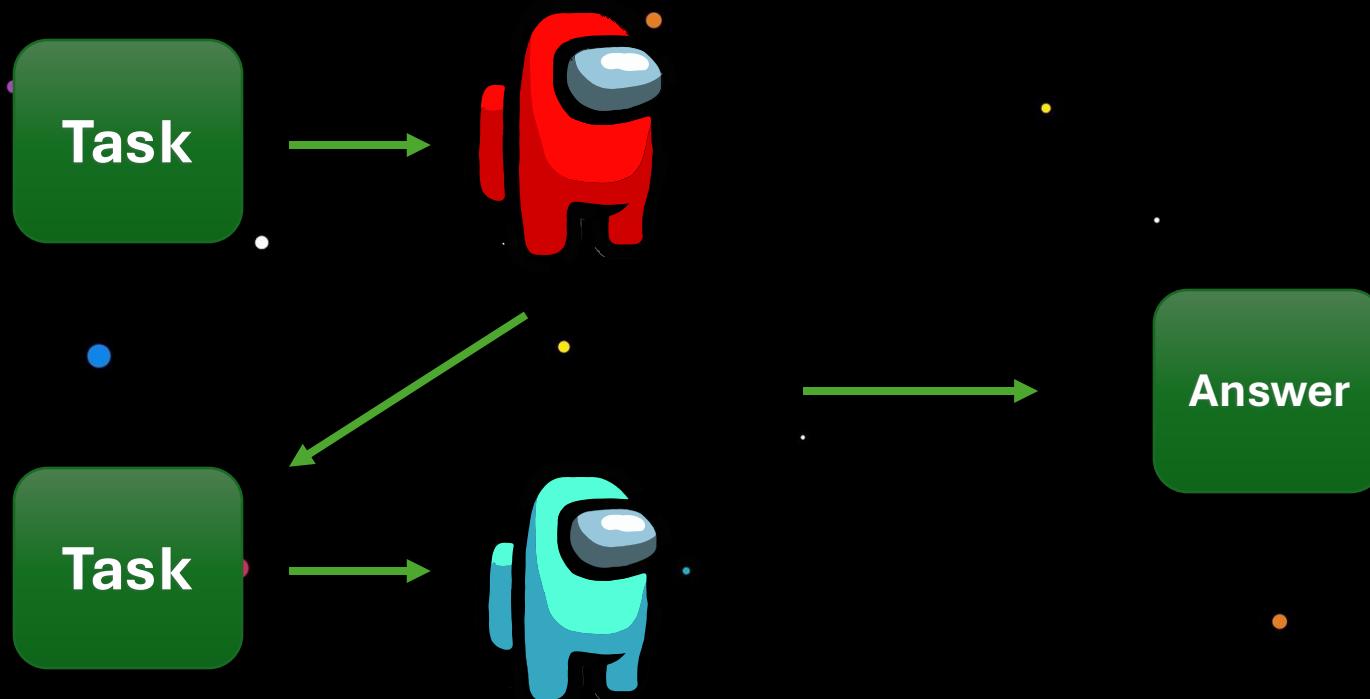
## Response

```
Search_hotels{  
  "location": "Singapore",  
  "max_price": 300,  
}
```

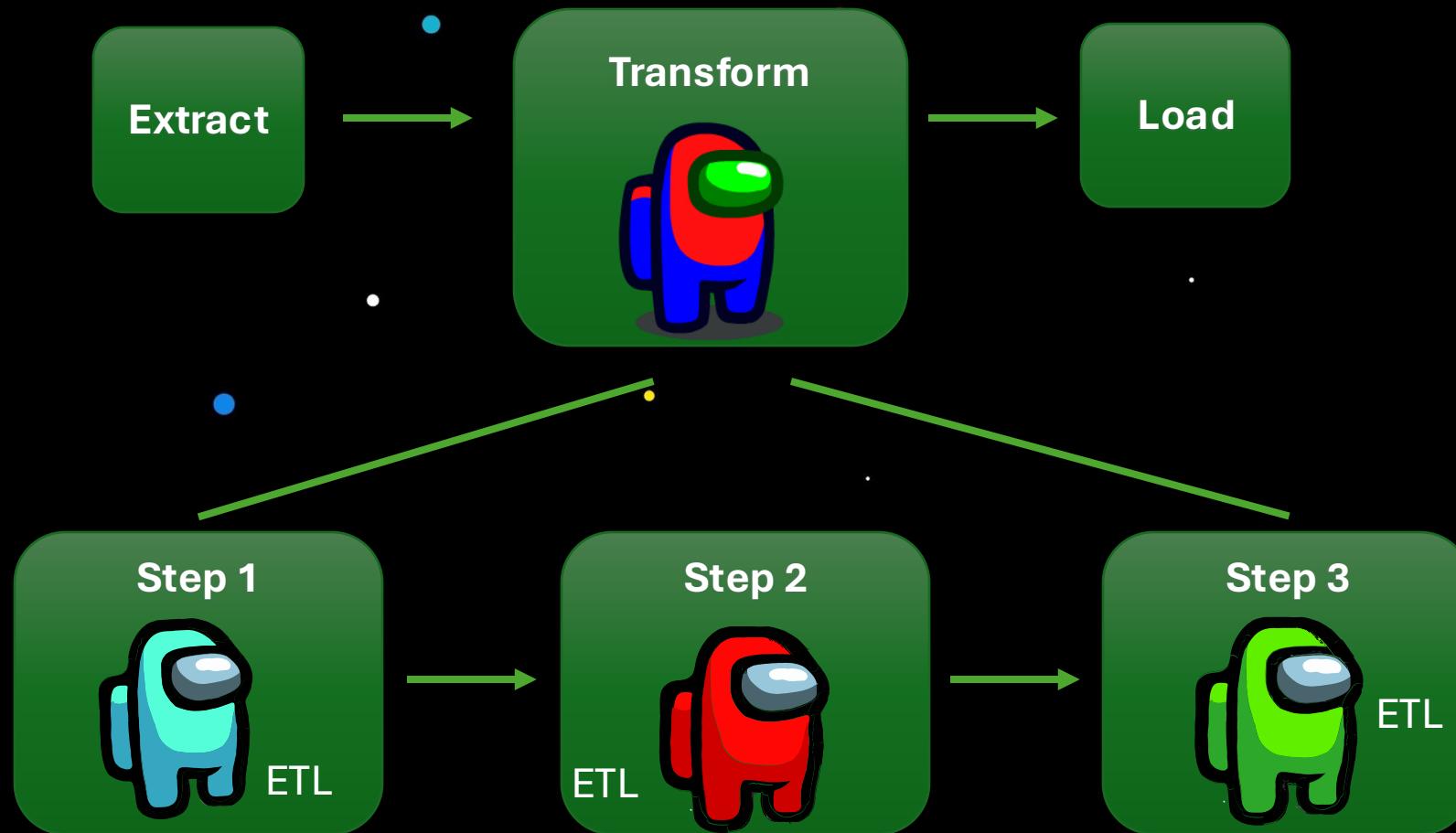


# Multi-Agent AI Systems

# What are Multi AI Agents?



# Data Pipeline Flow



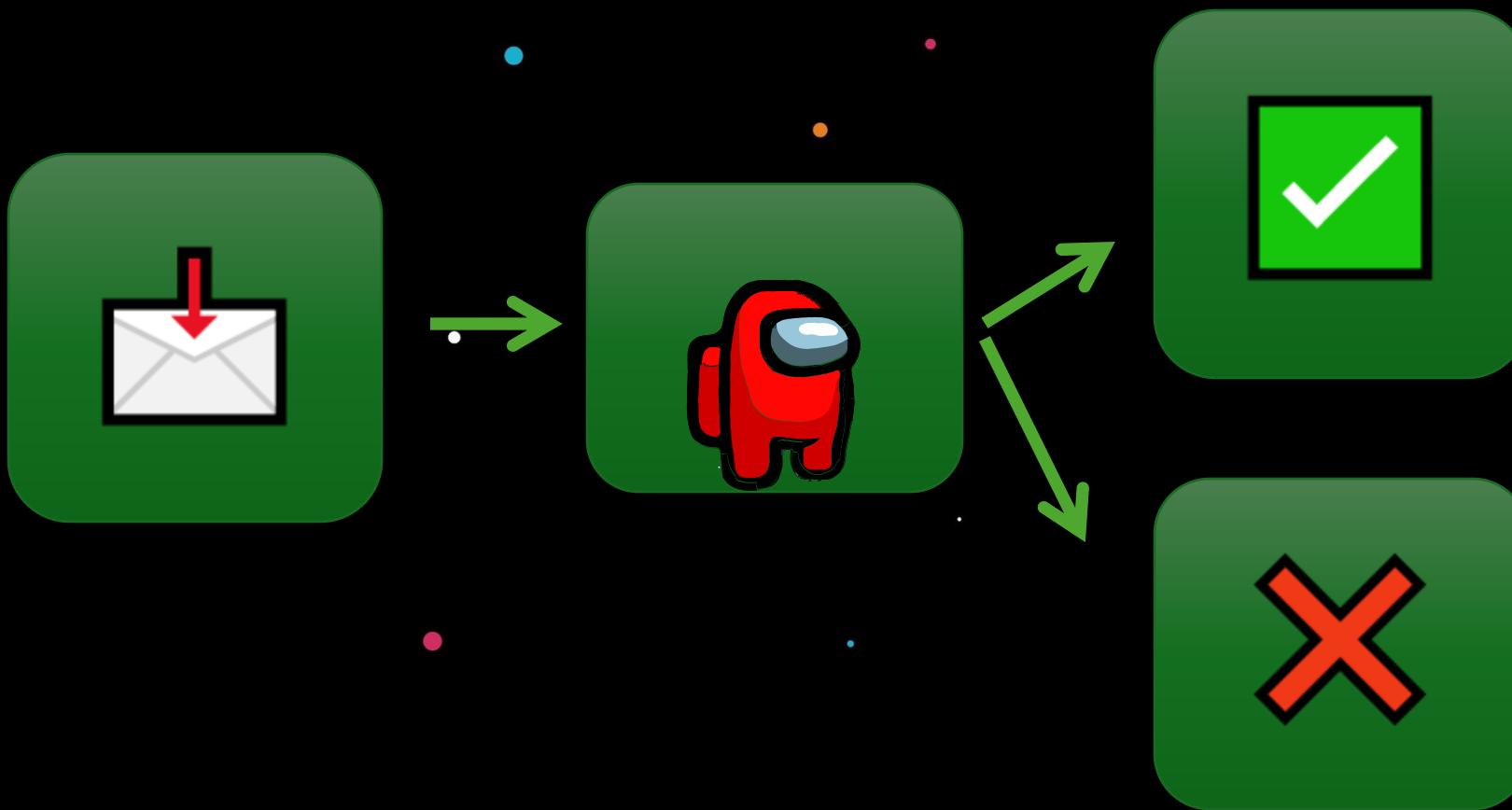
# Common Design Patterns

# LLM Workflows



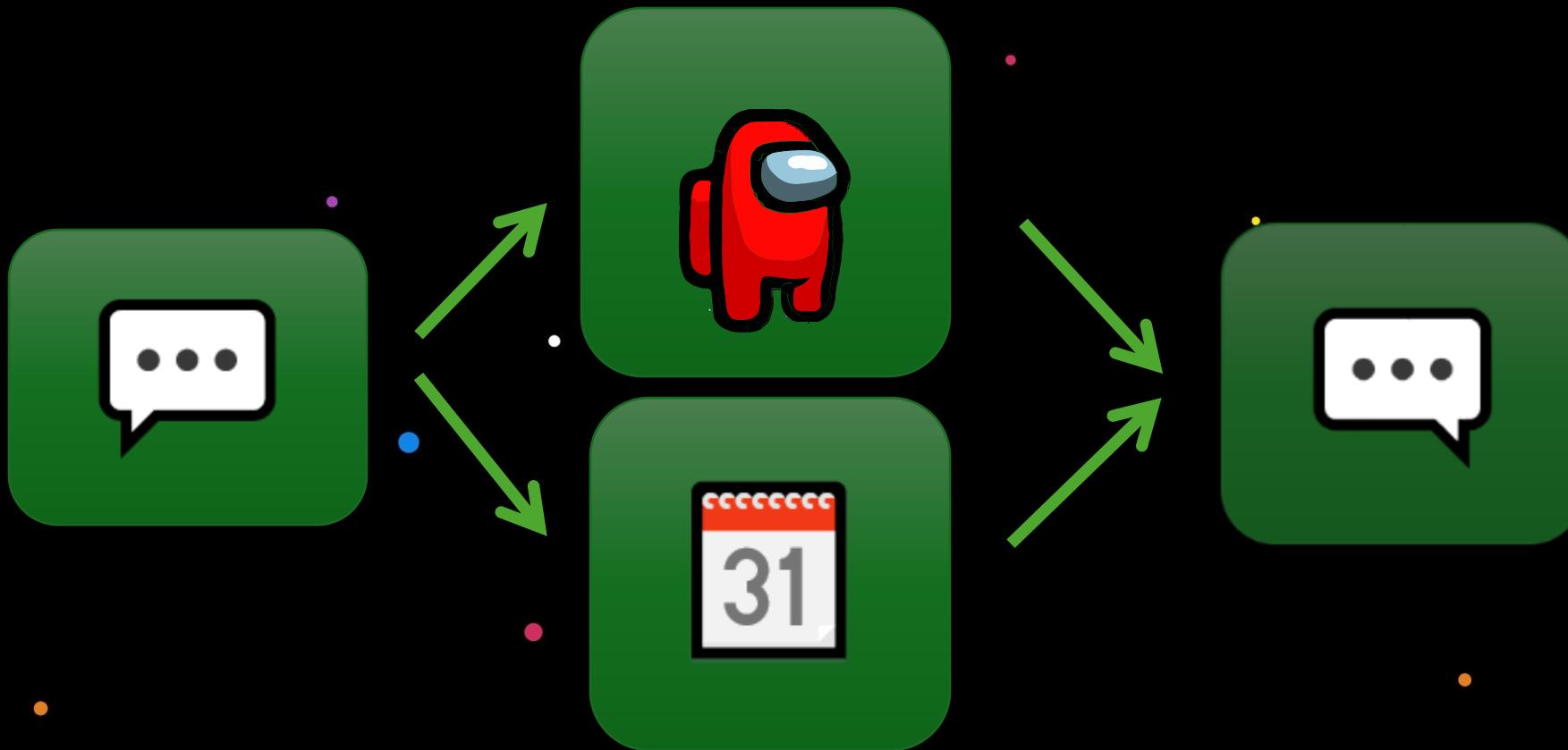
Chaining

# LLM Workflows



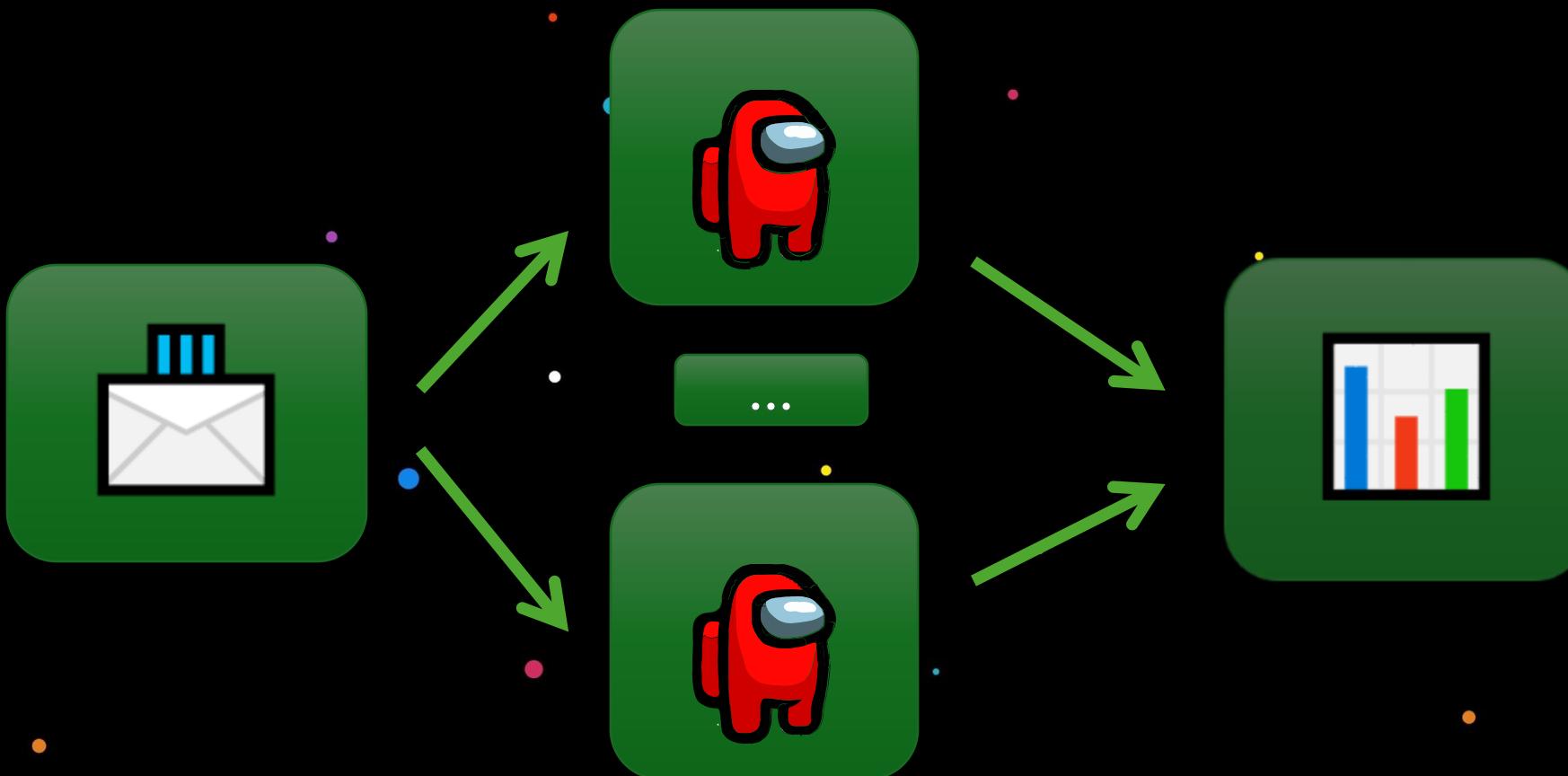
Routing

# LLM Workflows



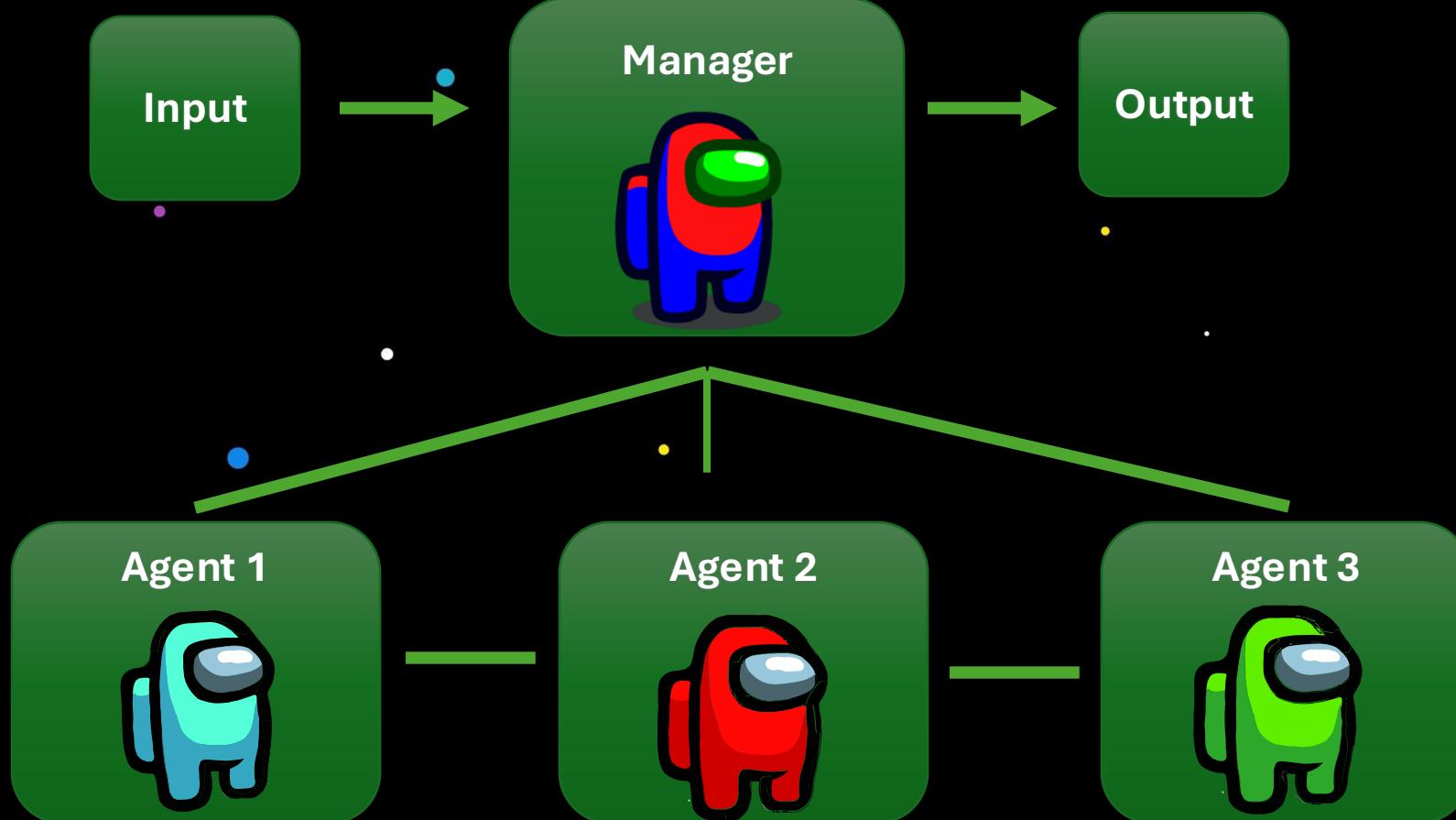
Parallelization  
(Sectioning)

# • LLM Workflows



Parallelization  
(Voting)

# LLM-Driven Flow



## Orchestrator-Workers

# LLM-Driven Flow



# Evaluator-Optimizer

# Orchestration



Code-Based  
Orchestration

Implicit  
Orchestration (todos)

Graph-Based  
Orchestration



# Key Elements of AI Agent

**Role Playing**

**Focus**

**Tools**

**Cooperation / Collaboration**

**Guardrails / Limitations**

**Memory**

# Agent Coaching Guide

Manager



Goal?

Process?

What kind of individuals would I need to hire to get this done?



Which processes and tasks do I expect the individuals on my team to do?



Task

Task

Task

Task

Task

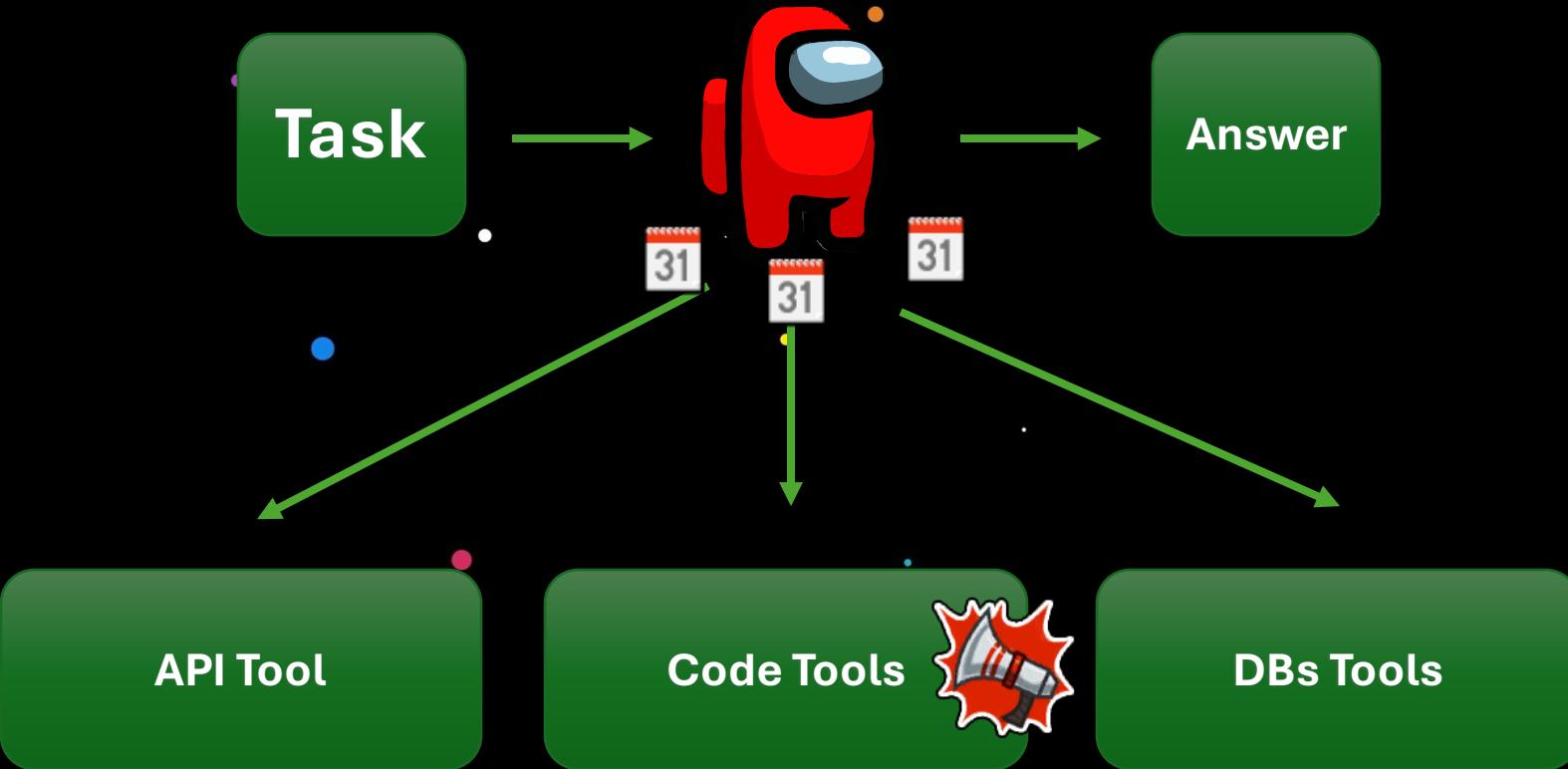


# WORKSHOP

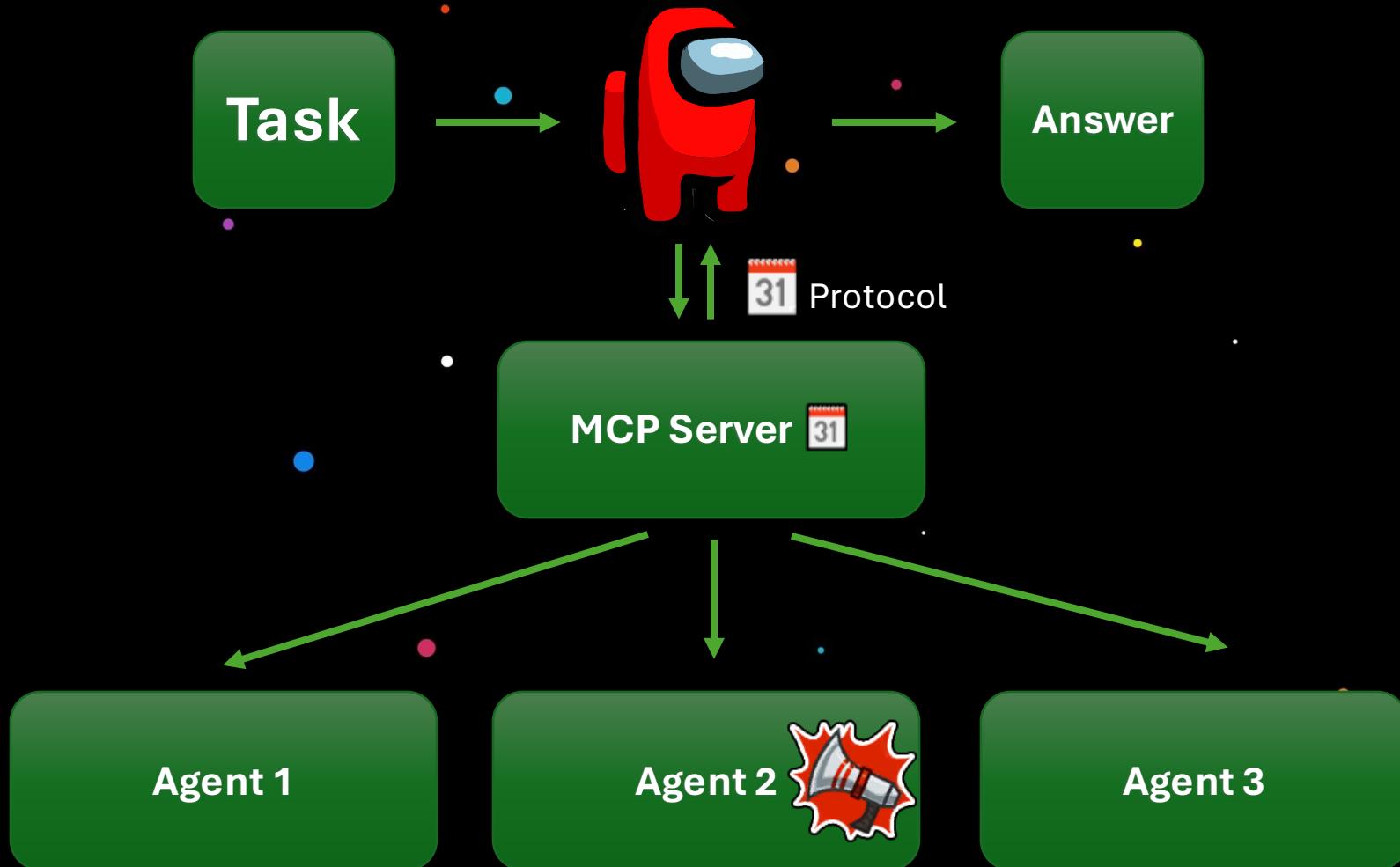


MCP  
Model  
Context  
Protocol

# AI Agent



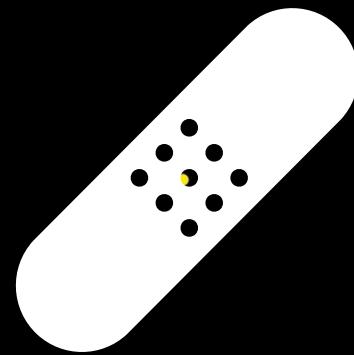
# MCP



# Why Should You Prioritize Responsible AI



Hallucinations

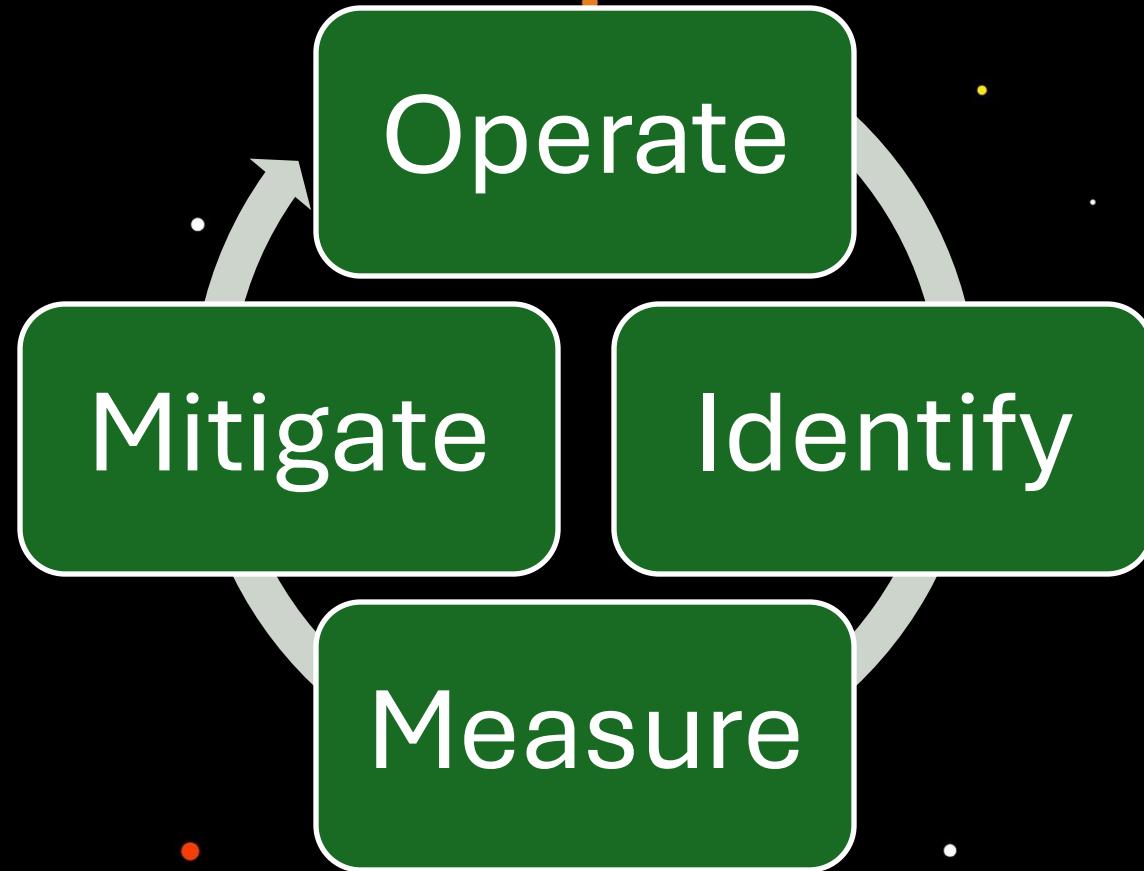


Harmful  
Content

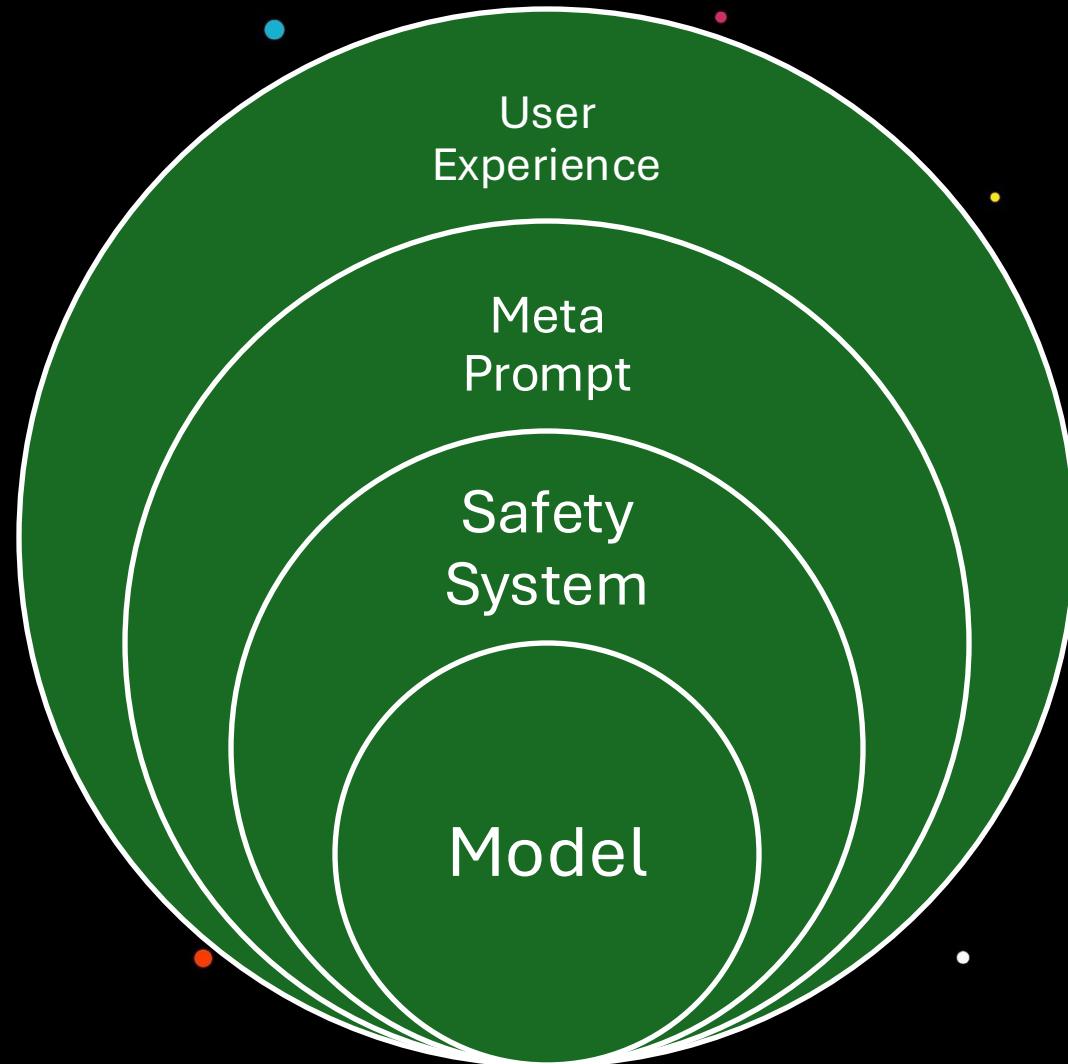


- Lack of  
Fairness

# Use Generative AI Responsibly



# Mitigation Layers



# Qualities of a great AI coach

1. Understands the limitations of AI.  
Think Safety, Responsible AI
2. Sponge for AI Knowledge / Profound Thinker / Visionary
3. Shares the Knowledge / Educates Others / Set expectations
4. Highly Energized and a Motivator
5. Knows the Agent, Ethics and Values

# Qualities of a great AI coach

6. Is an Effective Communicator & Prompt Engineer
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8. Is Disciplined, Strong in Character and Integrity. AI Ethics
9. Leads by Example with very High Attitude to Hard Work.
10. Displays Commitment and Clear Passion for the technology

# TAKEAWAY

	Traditional Software Development	AI Software Development
<b>INPUTS</b>	<ul style="list-style-type: none"><li>- Text with defined set (string)</li><li>- Numeric (int, float)</li></ul>	Fuzzy inputs: Open ended text <ul style="list-style-type: none"><li>- Tabular data, markdown, text, math operation</li></ul>
TRANSFORMATION	<ul style="list-style-type: none"><li>- Math Calculations</li><li>- If, else, else if</li><li>- For/while loops</li></ul>	Fuzzy transformations: <ul style="list-style-type: none"><li>- Extract list of key words</li><li>- Rewrite as paragraph</li><li>- Answer a question</li><li>- Brainstorm new ideas</li><li>- Perform logic/math reasoning</li></ul>
<b>OUTPUTS</b>	<ul style="list-style-type: none"><li>- Text with defined set</li><li>- Numeric (int, float)</li></ul>	Fuzzy output: text <ul style="list-style-type: none"><li>- Paragraph</li><li>- Number(s)</li><li>- JSON / Markdown</li></ul>
Notes	<ul style="list-style-type: none"><li>- Can be replicated</li></ul>	<ul style="list-style-type: none"><li>- Probabilistic: can be different every time</li></ul>

## • Relevant Links

1. <https://www.deeplearning.ai/short-courses/multi-ai-agent-systems-with-crewai/>
2. <https://www.deeplearning.ai/short-courses/ai-agentic-design-patterns-with-autogen/>
3. <https://platform.openai.com/docs/guides/prompt-engineering>
4. <https://microsoft.github.io/generative-ai-for-beginners/#/>

# DEMO



# Fuzzy inputs, transformation, outputs

INPUTS	Traditional Software Development	AI Software Development
TRANSFORMATION	- Math Calculations - If, else, else if - For/while loops	<b>Fuzzy inputs:</b> Open ended text - Tabular data, markdown, text, math operation
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# Ron Dagdag



R&D Engineering Manager at 7-Eleven

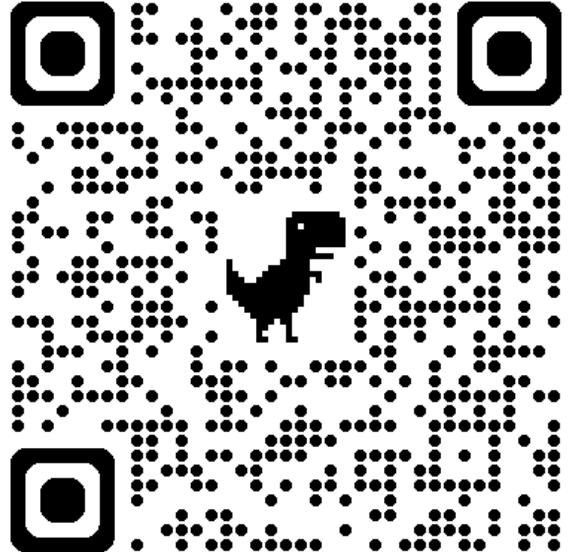
9th year Microsoft MVP awardee

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Thanks for geeking out with me about AI Agents



THANKS