

AI Agents (DRAFT)

Mark A. Austin

University of Maryland

austin@umd.edu

ENCE 688P, Spring Semester 2026

May 9, 2026

Overview

- 1 AI Agents
 - Definition, Strengths, Limitations
- 2 Software Considerations
- 3 Applications
 - Travel Planning System

AI Agents

Definition

AI Agent

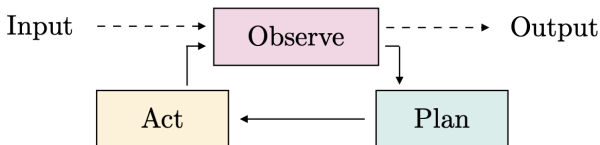
A **system or program** that can independently **plan** its **workflow** and **utilize resources** to carry out **tasks** on behalf of a user or another system.

AI agents can **perform various functions**, including **decision-making**, **problem-solving**, **interacting with external environments**, and **executing actions**.

An agent may use different chains of LLM to complete tasks on a user's behalf.

AI Agent Processing

ReAct (Reason+Act): Chains of LLM complete complex tasks.



The framework:

- Observe: synthesize past actions and explicitly determine what is currently known.
- Plan: determine that tasks need to be accomplished.
- Action: perform an action via an API, or look for relevant information in the system knowledge base.

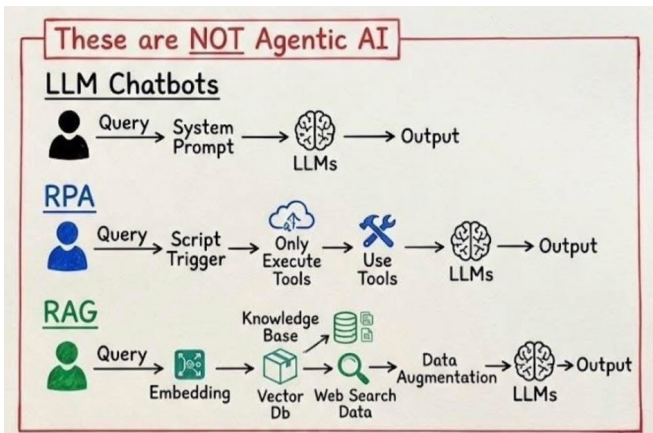
AI Agent Benefits

Agentic AI

Agentic AI

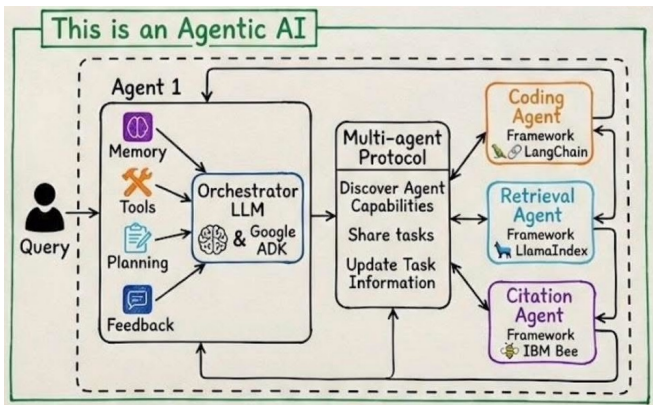
Agentic AI

Agentic AI



Source:

Agentic AI



Source:

Software Considerations

Applications

Travel Planning System

Travel Planning System

System Architecture

Travel Planning System

WeatherAnalysisAgent: ...

Travel Planning System

ItineraryPlannerAgent: ...

Travel Planning System

TravelPlanningSystemAgent: ...

Travel Planning System

Weather Data

Hotel Accommodation Data

References

- Amidi A., and Amidi S., Super Study Guide: Transformers and Large Language Models (First Edition), ISBN 979-8-836693-31-2, 2024.
- Lakshmanan V., and Hapke H., Generative AI Design Patterns: Solutions to Common Challenges when building GenAI Agents and Applications, O'Reilly, 2026.
- Raieli S., and Luculano G., Building AI Agents with LLMs, RAG and Knowledge Graphs, Packt Publishing, 2025.