AI Agents

A brief primer

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AI agents are...

“...software systems that use AI to pursue goals and complete tasks on behalf of users. They show reasoning, planning, and memory and have a level of autonomy to make decisions, learn, and adapt.”

(Google)

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AI agents are...

"...autono *t, make decisions* *t human oversight"*

...chatbots that can push buttons

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	AI Agent	AI Assistant	Bot
Purpose	Autonomously and proactively perform tasks	Assisting users with tasks	Automating simple tasks or conversations
Capabilities	Can perform complex, multi-step actions; learns and adapts; can make decisions independently	Responds to requests or prompts; provides information and completes simple tasks; can recommend actions but the user makes decisions	Follows pre-defined rules; limited learning; basic interactions
Interaction	Proactive; goal-oriented	Reactive; responds to user requests	Reactive; responds to triggers or commands

(Google)

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Computers have a 1D view of the world

“Draw a square”

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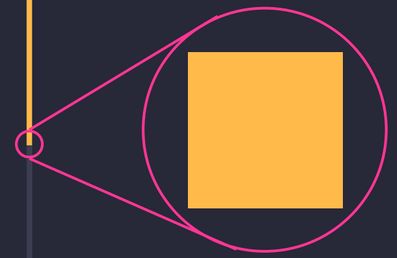
Computers have a 1D view of the world

“Draw a square”

What you see



One pixel at a time

What they see

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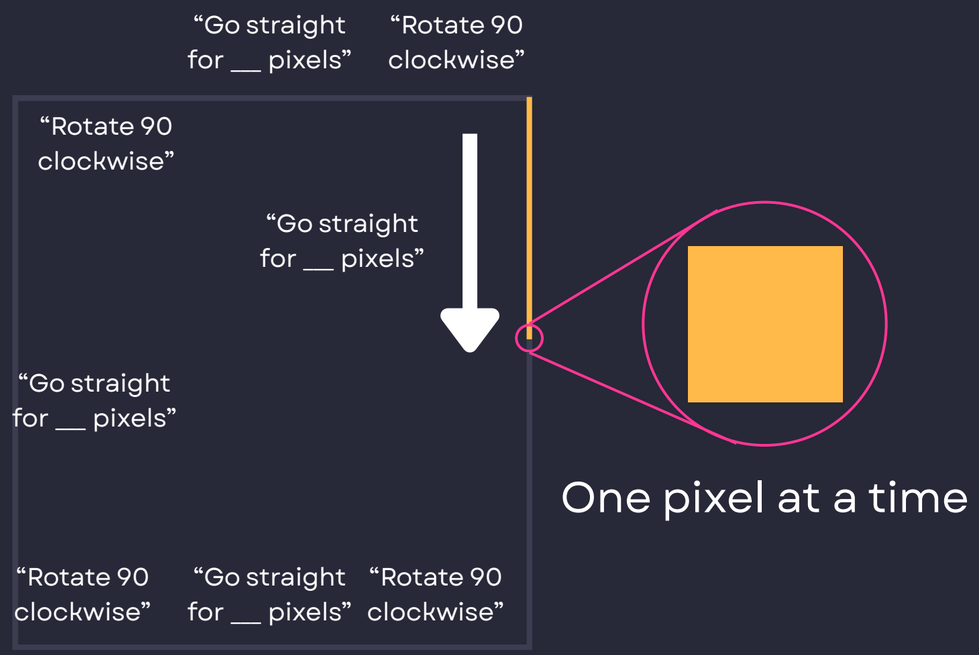
Computers have a 1D view of the world

"Draw a square"

What you see



What they see

Computers cannot see the whole screen

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Humans are more flexible at solving open-ended problems

Imagine going grocery shopping if you could only see a small part of the world at any given time

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Imagine going grocery shopping as a computer

Problem: Get groceries

↓

Choice: which store?

Tesco, *Aeon*, *99*, *7-11*, ...

↓

Choice: how do we get there?

Car, *walk*, *bicycle*, *airplane*, ...

↓

Choice: what if the door is closed?

What if it's a tunnel instead?

↓

...

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Conditions + logic → smarter decisions

Problem: Get groceries

Choice: which st

Tesco, A

get there?

, bicycle, airplane, ...

Choice: what if the door is closed?
What if it's a tunnel instead?

...

We use **control logic** to decide what to run based on conditions

E.g.

```
def choose_store(store):
     if tesco.status == "open":
          store = tesco
      elif aeon.status == "open":
          store = aeon
       else:
          store = 99

     if store == tesco:
          while x in range (len(nkve)):
               x+=1
```

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LLMs + programs = AI Agents

```
def next_action(state):
        prompt = {
                "You are a troubleshooting agent."
                f"Allowed actions: {', '.join(PERFORMANCE_ACTIONS)}."
                f"Current state -> disk_space={state['disk_space']}%, "
                f"high_cpu={state['high_cpu_processes']}. "
                "Respond with the format:\nAction: <one_action>\n"
        }


        reply = llm_chat(Prompt)
        Return reply.split(":",1)[1].strip()
```

LLM decides on course of action based on input data

Programs act as tool calls to execute given actions based on decision

```
def handle_performance_ticket(state):
        action=next_action_llm(state)
        if action == "clean_temp_files":
                clean_temp_files()
        elif action == "kill_high_cpu_processes":
                kill_high_cpu_processes()
        elif action =="escalate_deep_malware_scan":
                escalate("deep malware scan")
        elif action == "close_ticket":
                close_ticket()
```

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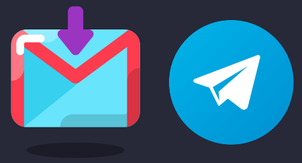
AI Agents are comprised of five parts



Perception / input

Environmental triggers, e.g. messages, API calls, sensor data

Decision-making logic

- Determine what actions need to be performed at what stage.
- Manage through an AI model, typically an LLM.

Function calls (tools)

- LLMs can't/are bad at executing - we write programs to help them call tools.
- E.g. calculator, internet search, file management for IDEs like Cursor

Loops

- Need to keep making decisions until reaching the end of the task.
- Initial decision → reassess → next decision

```
while True
        prompt = previous_steps +"if trip is booked return done"
        status = LLM.eval(prompt)
        if status == "done":
                break
```

State management

- The decision space keeps changing - need to remember what was done to know what is next.
- Can be stored in a prompt or external database.

redis

supabase

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Here’s a demo for a simple agent

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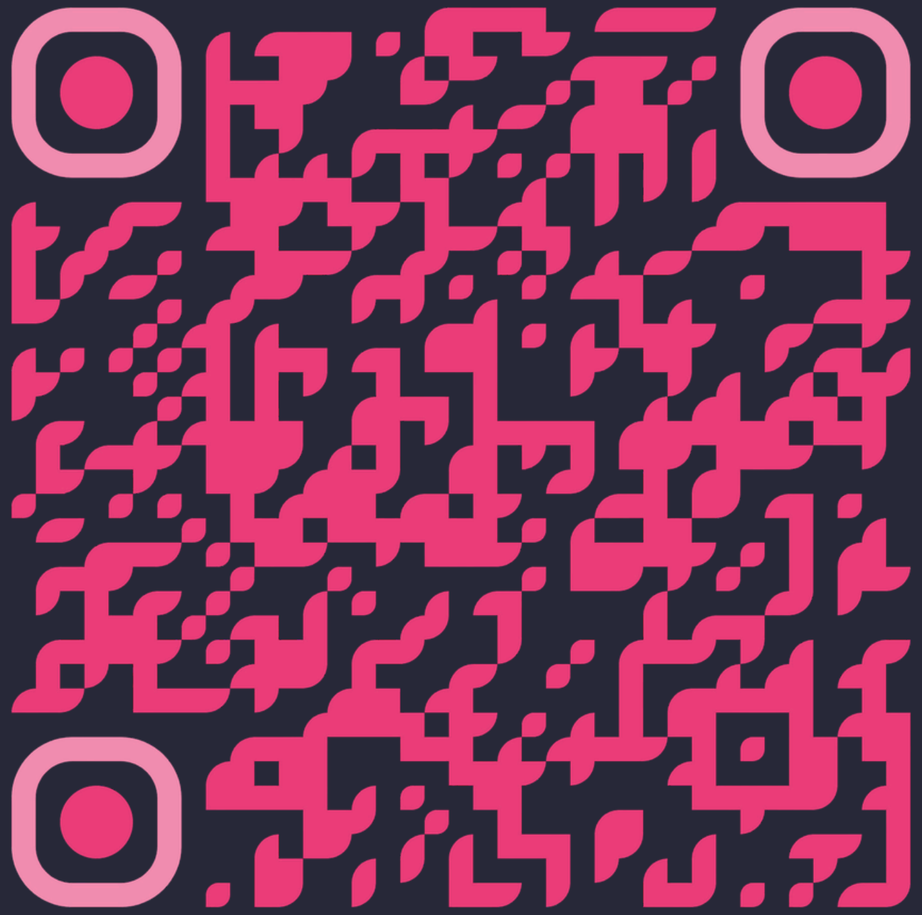
Here’s another demo of a simple research agent



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Some useful agent-building tools

Workflow builders

zapier

Gumloop

make

Research

LangChain

Multi-agent control platforms

Relevance AI

crewai

Lindy