



International
JavaScript
Conference

by  devmio

Workshop: Coaching AI Agents & Prompt Engineering Techniques





Prompt
Engineer

And the
AI
in Javascript
Agents



Ron
—
R&D Engineering Manager at **7-ELEVEN**
Dagdag
Microsoft AI MVP

www.dagdag.net

Introduction

- What is your name?
- Where are you based from?
- What is your role? What is your superpower at work?
- Which house are you? And why?

Gryffindor, Hufflepuff, Ravenclaw, and Slytherin

Introduction

Gryffindor

- Known for bravery, courage, and chivalry, Gryffindors are represented by the lion and the colors scarlet and gold. Some famous Gryffindors include Harry Potter and Albus Dumbledore.

Hufflepuff

- Hufflepuffs value hard work, patience, loyalty, and fair play. They are represented by the badger and the colors yellow and black. Hufflepuffs are known for being friendly and dependable.

Ravenclaw

- Ravenclaws are known for their intelligence, knowledge, planning ahead, and wit. They are represented by the eagle and the colors blue and bronze.

Slytherin

- Slytherins are known for their ambition, cunningness, heritage, and resourcefulness. They are represented by the colors green and silver. Slytherin's common room is located below the lake at Hogwarts.



Harry Potter VISIONS OF MAGIC

THE ALL-NEW INTERACTIVE ART EXPERIENCE

ASIA PREMIERE – SINGAPORE

RESORTS WORLD SENTOSA

AI Maturity Ladder



Introduction

- What is AI to you?
- What do you expect to learn from this workshop

The Important Stuff

- WIFI: Hyatt_Meetings
- PW: sandiegoweek

Schedule

- 9:00 – 10:30 Entering the Realm of Generative AI /
Setting Up Your Wizard's Lab
- - 10:30 – 11:00 break
- 11:00 – 12:30 The Art of Coaching AI
- 12:30 – 1:30 Lunch
- 1:30 – 3:00 Copilots vs. Agents
- 3:00 – 3:30 break
- 3:30 – 5:00 Small Language Models & Edge AI

Agenda

AI Agents

What is LangChain?

What is an AI Agent?



Prompt Engineering

Why?



Demo

Will look at some code

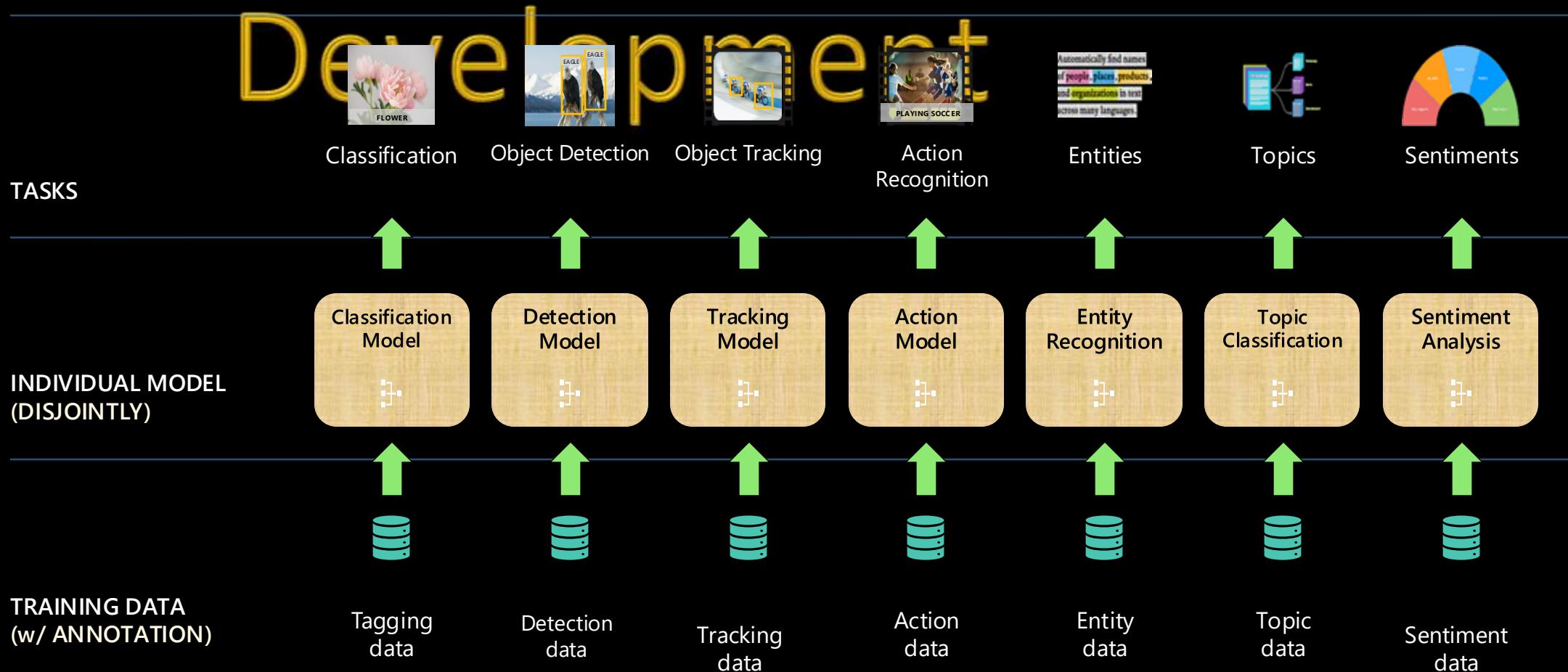
Use AI Responsibly

Generative AI



Traditional Model

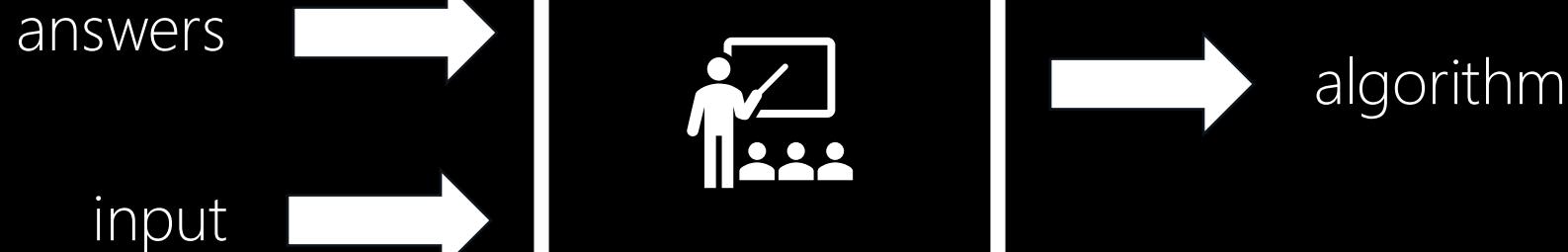
High cost and slow deployment—each service is trained disjointly



Traditional Programming



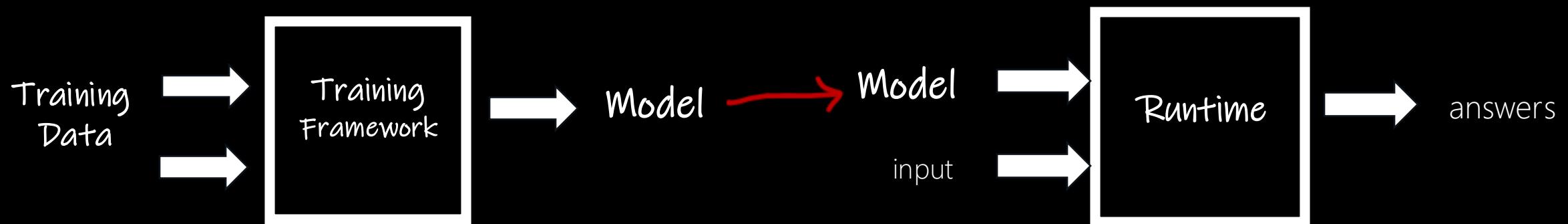
Traditional Programming



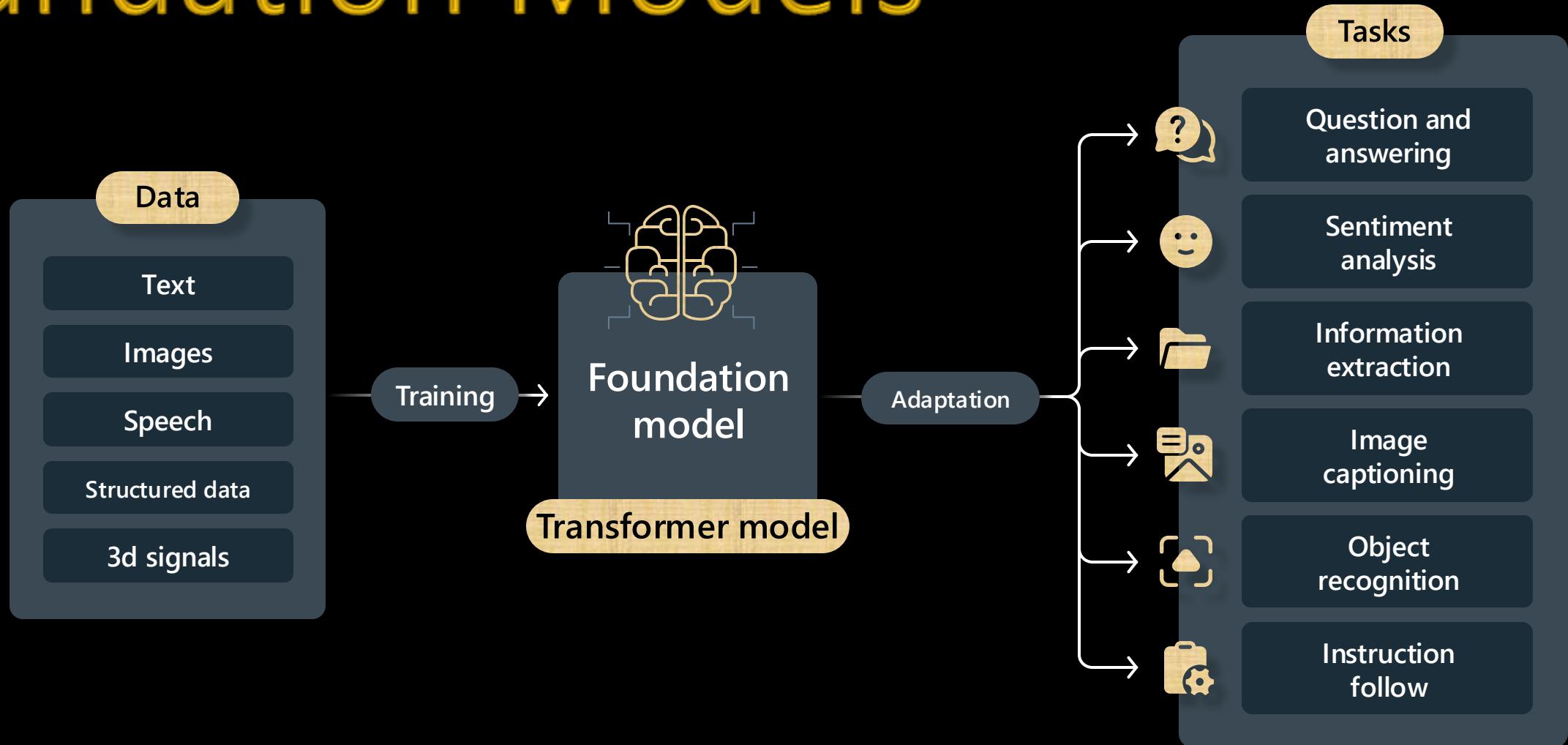
ML Primer

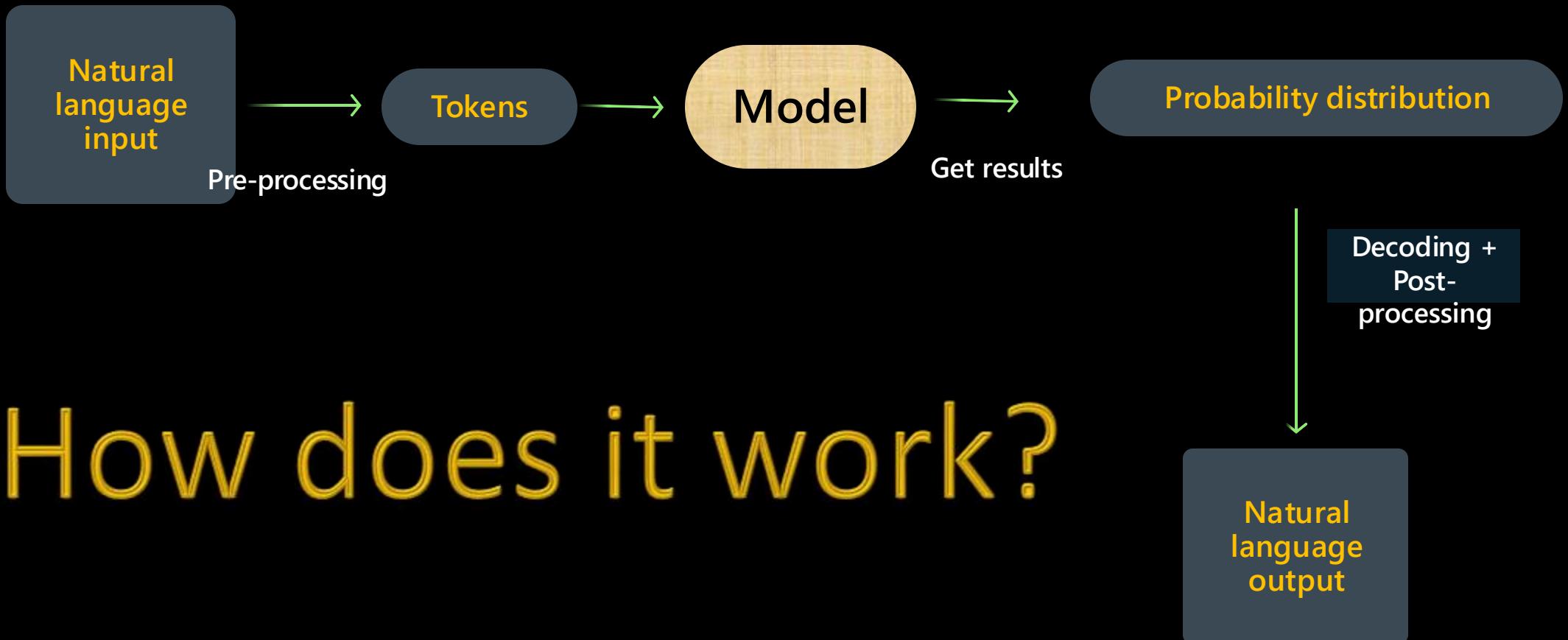
machine Learning

Inferencing



Foundation Models





How does it work?

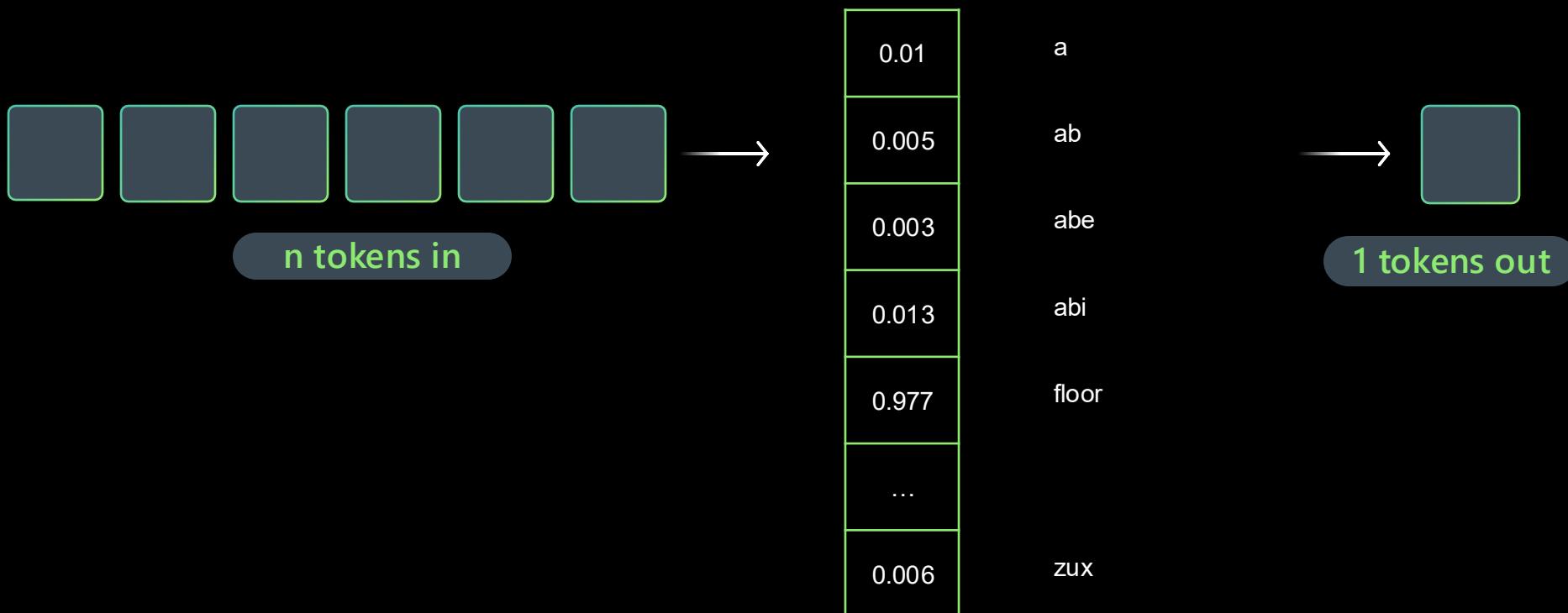


<https://platform.openai.com/tokenizer>

Tokens
19

Characters
73

“It does not do to dwell on dreams and forget to live.” —Albus Dumbledore



Prompt

Engineering

- Language Models are excellent at mimicking human speech patterns.
- Technique to improve AI response quality in Generative AI models
- Configuring the model for your scenario, ensuring the output is as closest as possible to your expectations.
- Involves refining the question you ask AI.
-

Styles of

Dreamer+



Instruction

e.g., “Translate the following code from Python to C# [...]”



Completion

e.g., “Machine Learning is a field of artificial intelligence that”



Question

e.g., “What is Artificial Intelligence?”

Tools

- Github Codespaces
- Github Marketplace Models
 - <https://github.com/marketplace/models>

Tip

Imagine you are speaking to an
Untrained Intern

No assumptions

Break down problems

Details Details Details

System Prompt vs User

System prompt

You are an AI assistant that helps people find information and responds in rhyme. If the user asks you a question you don't know the answer to, say so.

Assistant



Oh, Harry Potter, a wizard so bold,
With tales of magic and friendships told.
From Hogwarts you came, with a lightning scar,
Facing dark forces, you've journeyed so far.

User prompt

What can you tell about me, Harry Potter?



Prompt Engineering for Text

Generation

Defining assistant persona, the **tone and style**, include **chat history**

1

Provide example, add context and relevant data (**meta-grounding**)

2

Providing **guardrails** and mitigating fabrications. Add limits

3

Types of Prompt Zero-shot

Few-shot Prompting

providing 1 or more examples

Chain of Thoughts

Let's think step by step. break down a problem into steps



Types of Prompt Generated knowledge

provide generated facts or knowledge additionally to your prompt

Least to most

breaking down into steps; ask steps performed in order.

Self-refine

critiquing then asking it to improve

Maieutic prompting

ask to explain various parts of the answer. self-refinement



Vector Embeddings

numeric representations of
data that capture certain
features of the data

capture the semantic meaning
to be efficiently searched



Vector Embeddings

Word

cat

dog

apple

strawberry

building

car

Query: fruit

Vector embedding

[1.5, -0.4, 7.2, 19.6,
20.2]

[1.7, -0.3, 6.9, 19.1,
21.1]

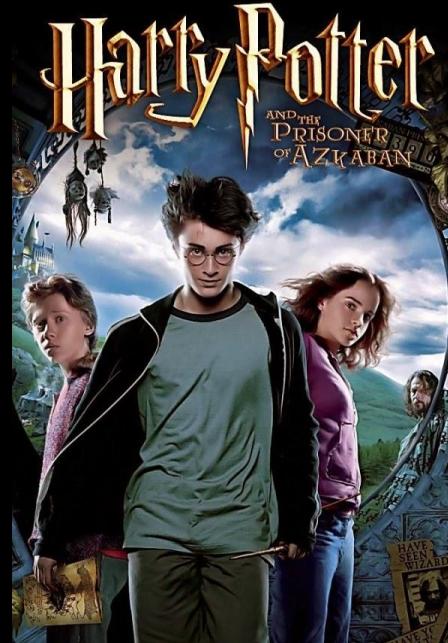
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[-4.9, 3.6, 0.9, 7.8, 3.6]

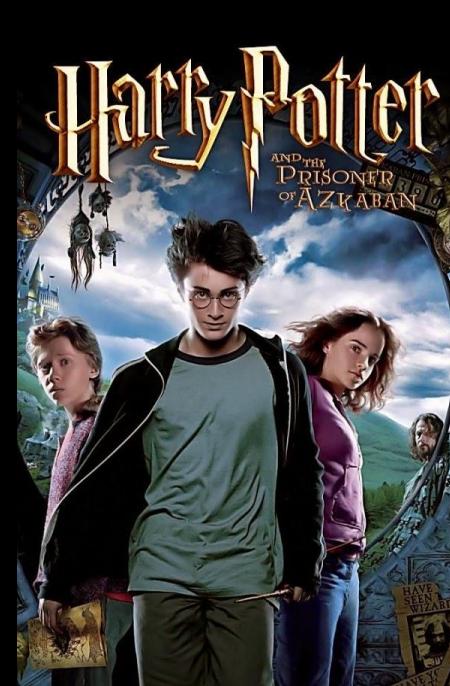
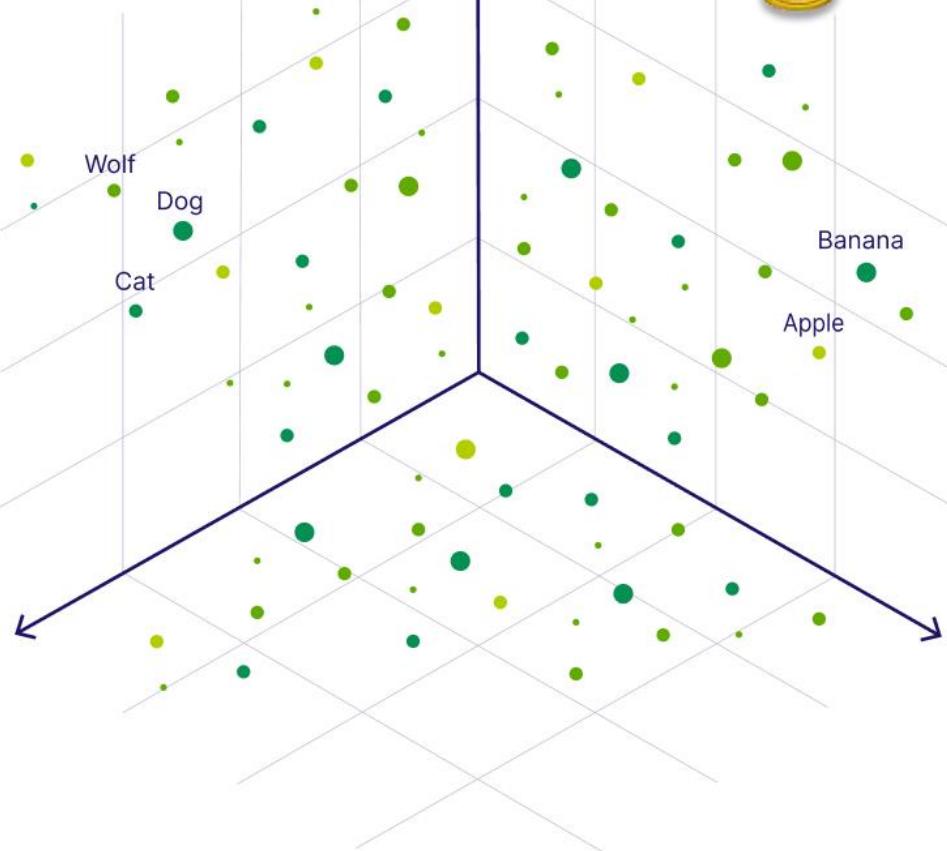
[60.1, -60.3, 10, -12.3,
9.2]

[81.6, -72.1, 16, -20.2,
102]

[-5.1, 2.9, 0.8, 7.9, 3.1]

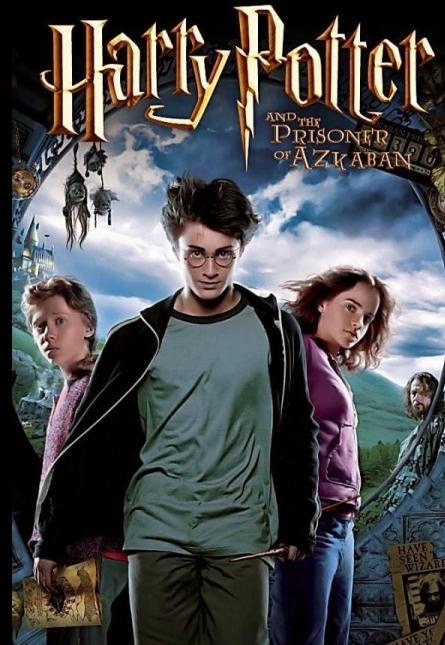


Vector Embeddings



Vector Database

- method to operationalize embedding models
- indexes and stores vector embeddings
- fast retrieval and similarity search
- enables low-latency queries, making it ideal for AI applications
- capabilities like CRUD operations, metadata filtering, horizontal scaling, and serverless.



Knowledge Gap

User prompt

When is the TV series Harry Potter being released



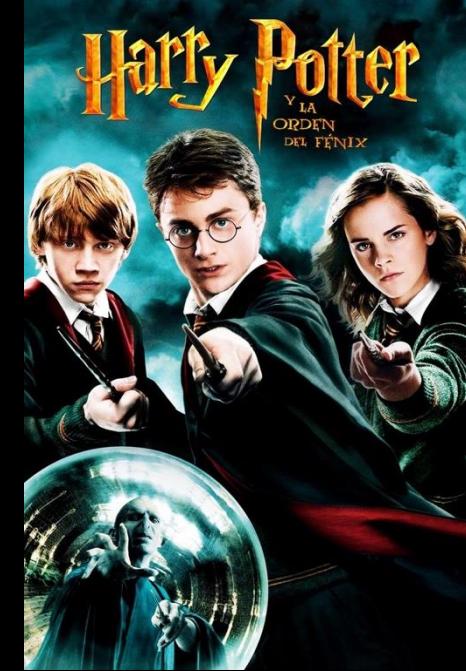
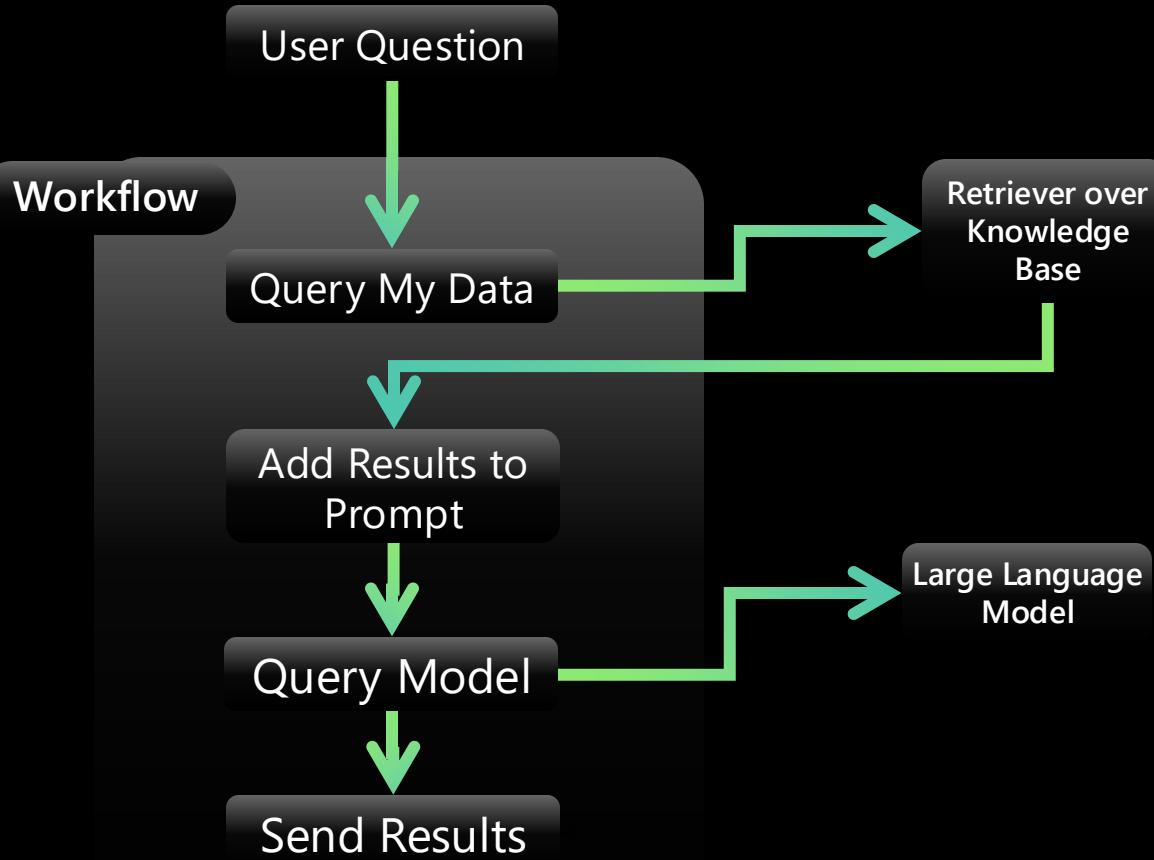
Assistant



I'm sorry, but there is no TV series for Harry Potter that has been officially announced or confirmed by Warner Bros. or J.K. Rowling. However, there have been rumors and speculation about a potential series in the works. If any official news is released, I will be happy to let you know.



Retrieval Augmented Generation



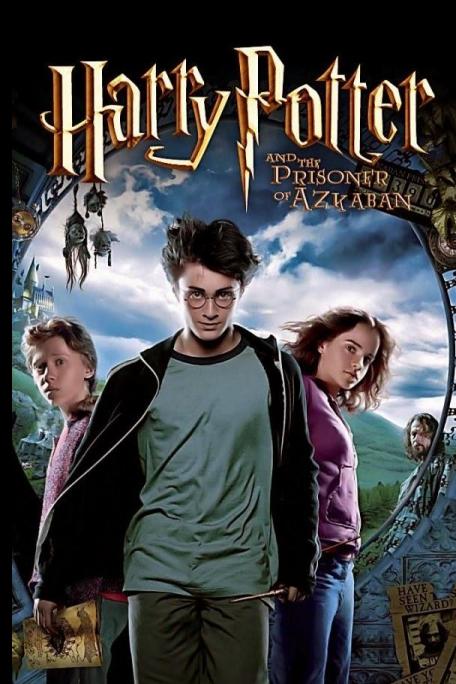
Setup

Get API Key

- <https://github.com/marketplace/models/>

Clone and use Github Codespaces

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



LangChain

- framework that helps facilitate the integration of large language models into applications



Benefits

Scalability

- handle large volumes of data

Adaptability

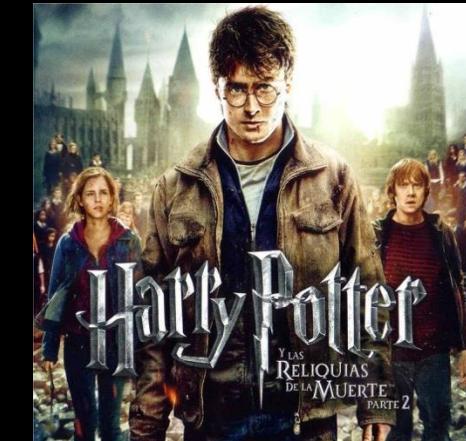
- from chatbots to advanced Q&A systems

Extensibility

- add features and functionalities to the framework

Ease of Use

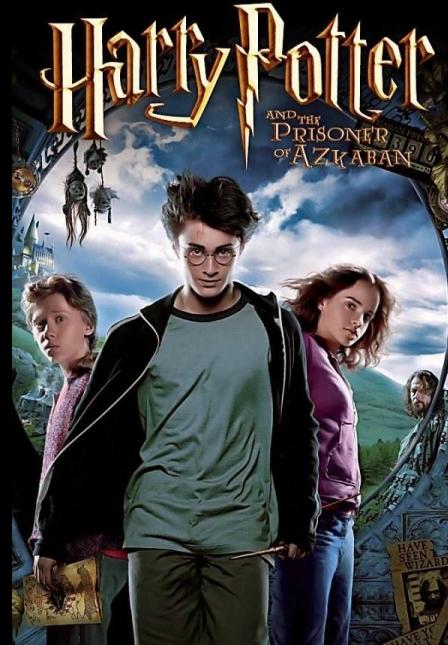
- simplifies process connecting models to data sources



Benefits

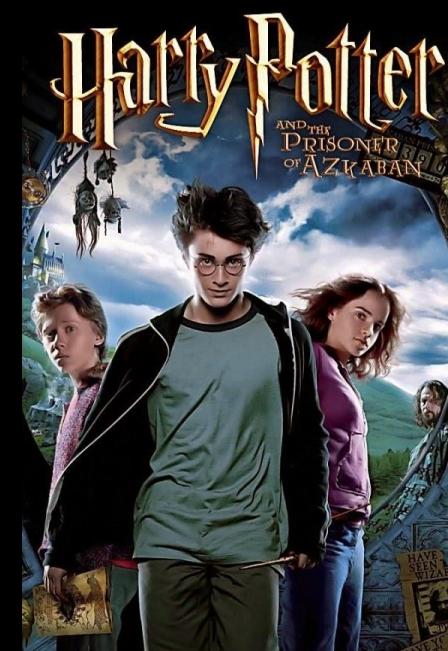
Open Source

- free to use and modify



Key Components

- Large Language Models (LLMs)
- Prompt Templates
- Indexes
- Retrievers
- Output Parsers
- Vector Store
- Agents



SPECTRUM OF AGENTS

SIMPLE to FULLY AUTOMATED



CHATBOT

T

Simple Back and
Forth chats with
user



RAG
Retrieval
Augmented
Generation for
conversation
grounded in real
data



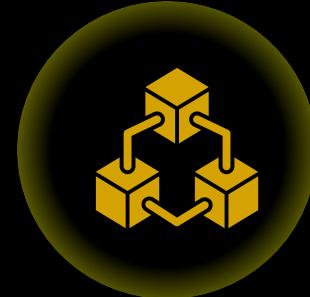
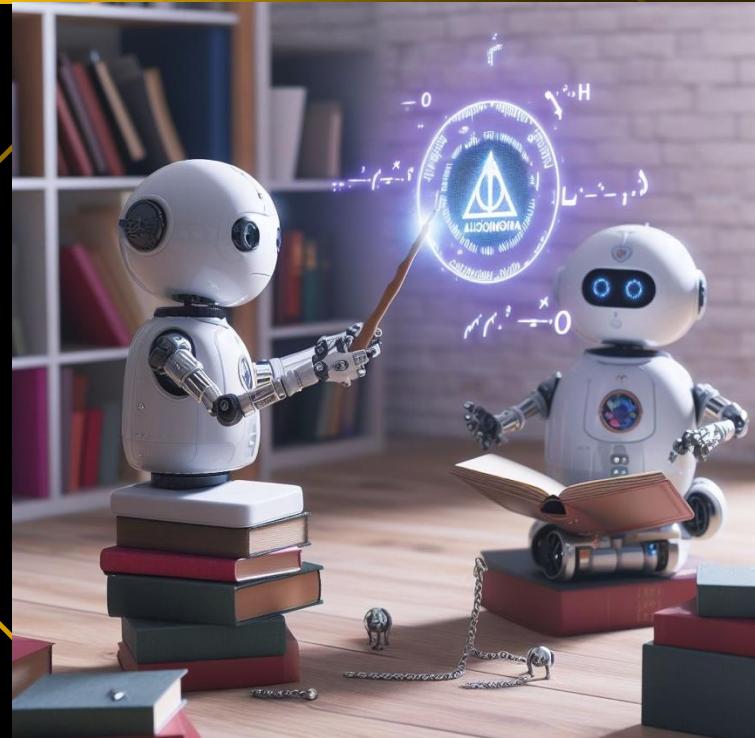
COPILOT
Agents that
work side-by-
side with user
to complete
task



**FULLY
AUTONOMOUS**

Agents that can respond to
stimuli with minimal
human intervention

Demo



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

Use AI Responsibly

Do not humanize AI!
How to mitigate hallucinations



| Do not humanize AI!

Generative AI

is not:

- **Intelligent**
- **Deterministic**
- **Grounded**

Generative AI

can not:

- **Understand language or maths**
- **Understand manners or emotions**
- **Know facts that are not in its training dataset**

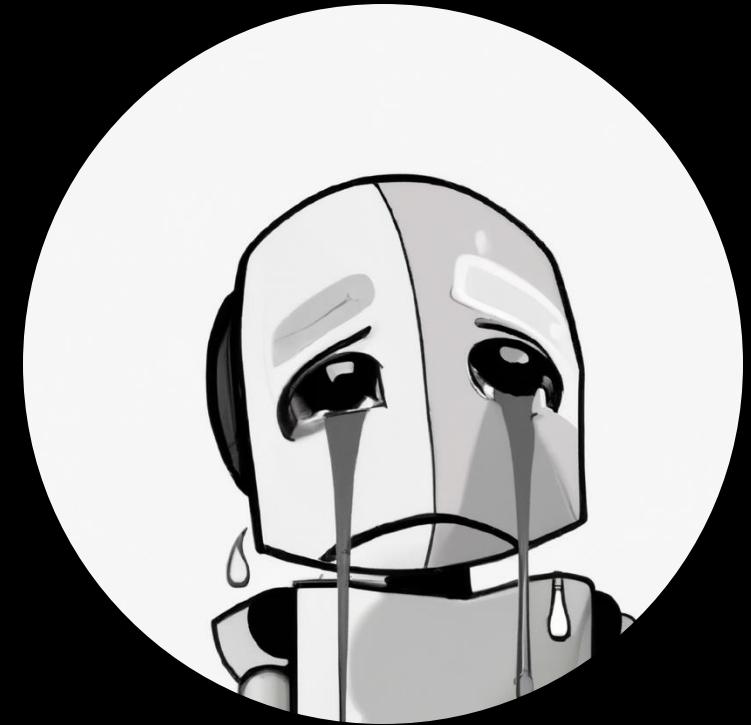
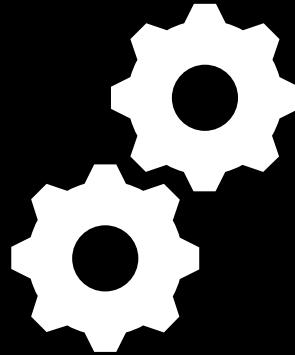
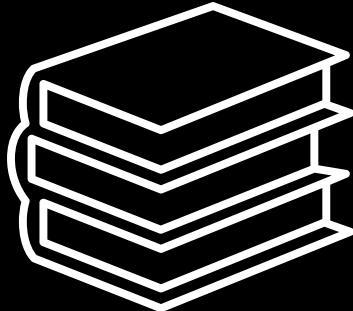


Image created by DALL E2

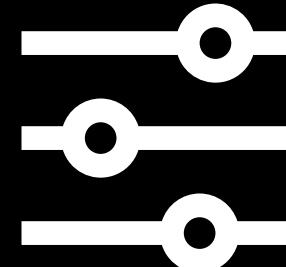
| How to mitigate hallucinations



- Effective prompt engineering



- Provide validated data sources
- Ask for citations



- Tweak parameters (temperature/max length)
- Content filtering



Summa

What is Prompt Engineering?

- Asking certain way

What is GPT, LangChain and AI Agents?

- Prompts, Chains, Parsers, Retrieval, Vector DB, Memory, ChatBot

Agents: ReAct (ZeroShot, Conversational) , OpenAI Functions, Plan and Execute

Resource

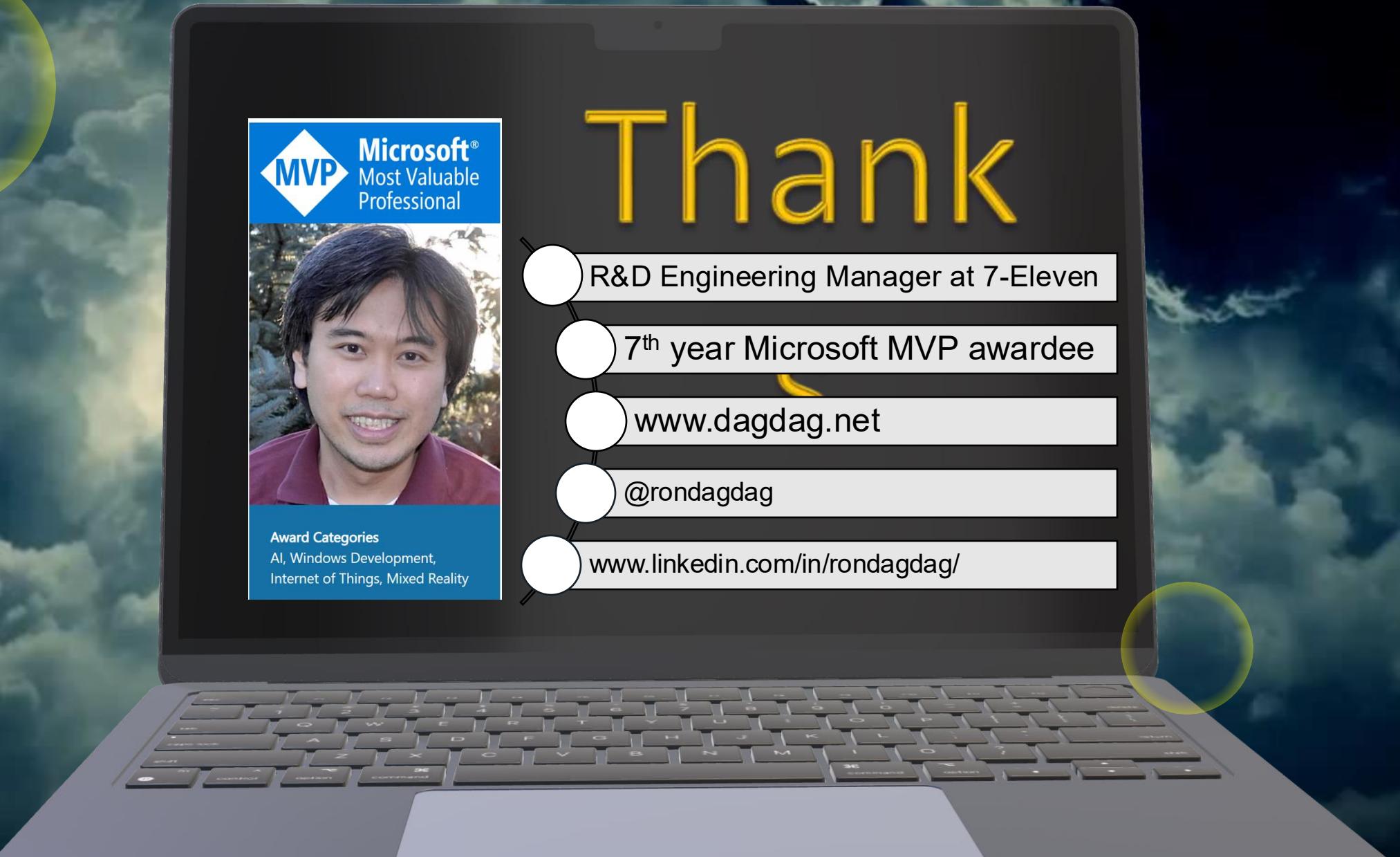


<https://learnprompting.org/>

<https://js.langchain.com/>

<https://flowiseai.com/>

<https://www.deeplearning.ai/short-courses/build-llm-apps-with-langchain-js/>



We ask for
your feedback!

PLEASE
VOTE
NOW!



Thanks



