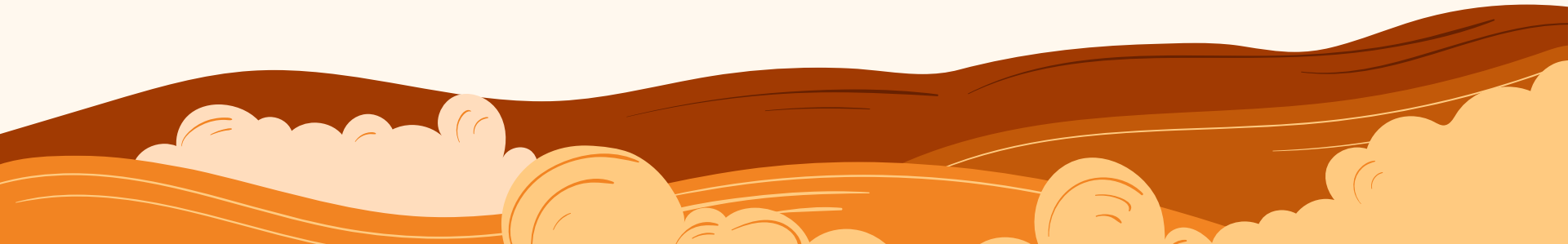
WHEN MODELS BECOME ACTORS !

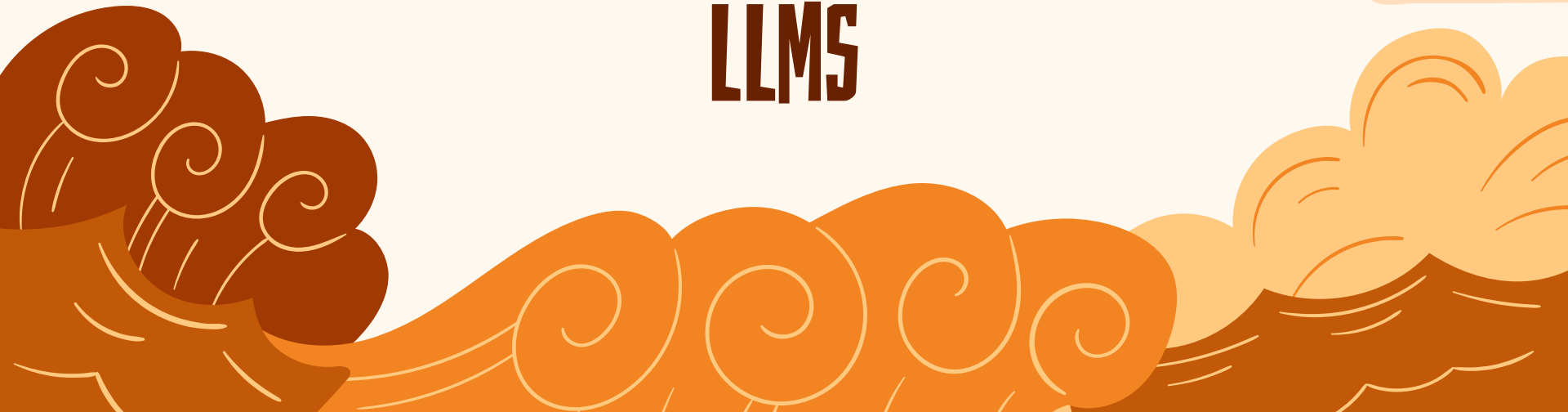
The shift from LLMs to Intelligent Agents

TABLE OF CONTENTS



01

A BRIEF INTRODUCTION TO LLMS



IMPORTANT TIMELINE

#1

2017

Attention is All You Need

#2

2018

GPT-1: 117M parameters

#3

2020

GPT-3: 175B parameters, Introducing In-context learning

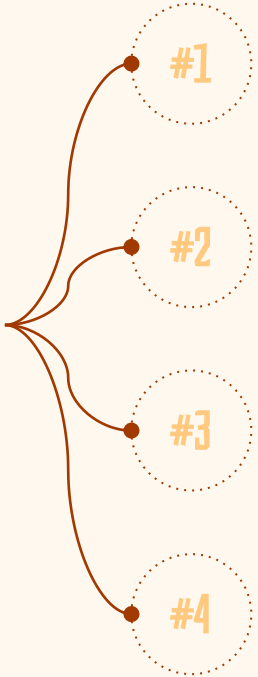
#4

2022

OpenAI ChatGPT: The beginning of a global wave of Generative AI

HOW DO LLMS ACTUALLY WORK?

STEPS



PRE-TRAINING: LEARNING HOW TO TALK!

Next token prediction, given previous tokens.

POST-TRAINING: ALIGNMENT AND FINE-TUNING

Question Answering, Generating desired outputs, and doing more complex tasks.

REASONING: LEARNING HOW TO THINK!

Problem-solving and Planning, e.g, doing math.

MULTI-MODALITY: DIFFERENT INPUT TYPES

Understanding images, audio, etc.


02
WHY WERE LLMS
NOT ENOUGH?

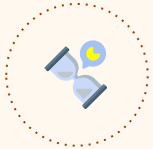
“A brain without a body could not think!”

–MOSHE FELDENKRAIS

LIMITATIONS

NO MEMORY AND STATE

Models were unable to recall long-term interactions and maintain their state during multi-step tasks.



NO UP-TO-DATE DATA

ChatGPT still believed that Queen Elizabeth was the queen!

HALLUCINATION

Confidently thinking knows everything.

INACCURATE CODES

Were not able to test&debug codes.

LIMITED AUTONOMY

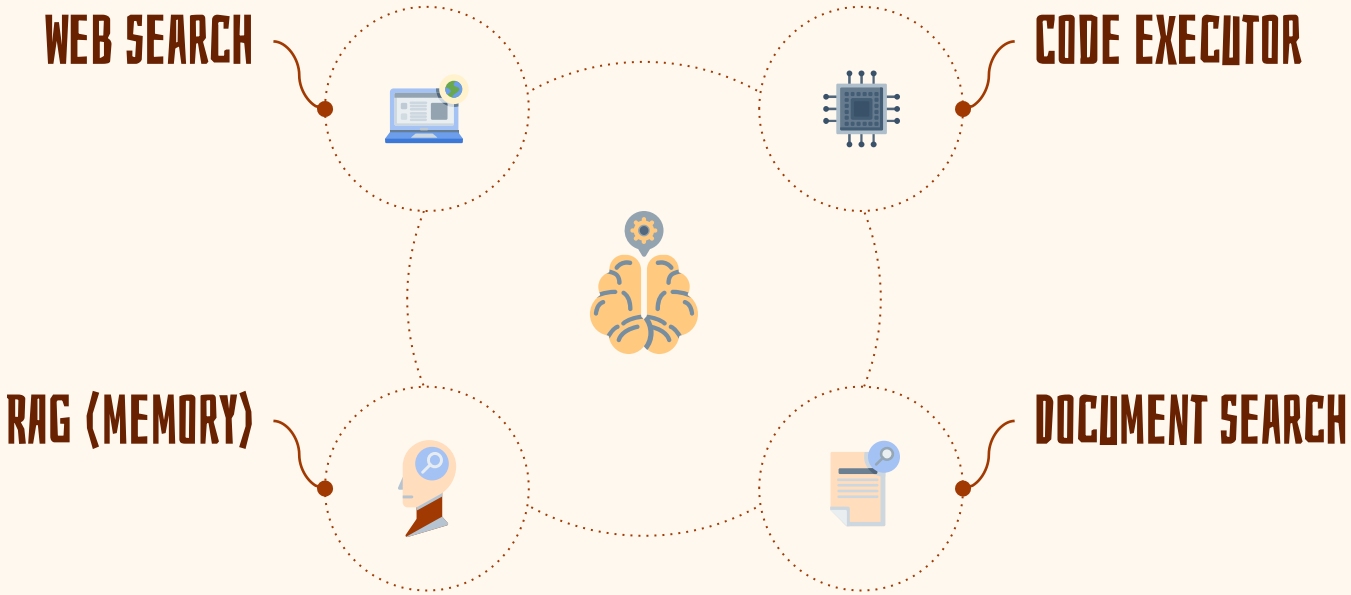
Could not decide what to do next!

SCALING HUMAN TASKS

No coordination, no parallel tasks.

03 SHIFT TO (LLM) AGENTS

SINGLE -AGENT: (TOOLS AND ACTUATORS)



MULTI-AGENT ARCHITECTURE

Now that we have (almost) autonomous single agents, they can know cooperate to perform a task!

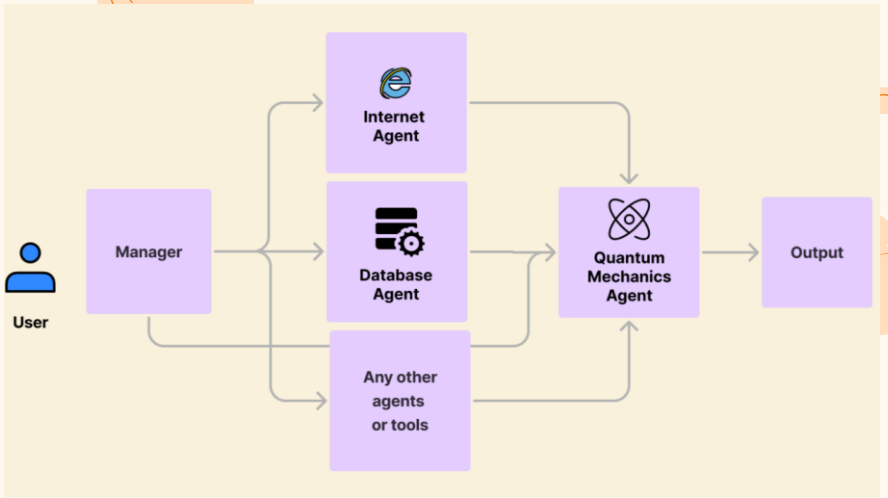
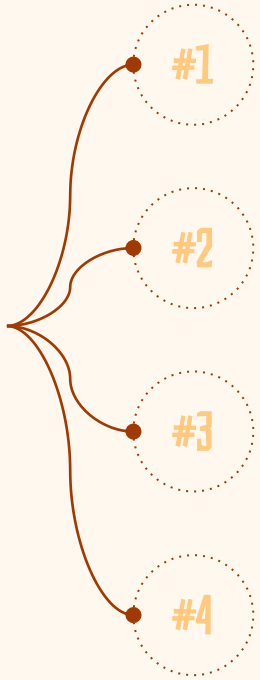


Image source

HOW DO MULTI-AGENT SYSTEMS WORK?

STEPS



PLANNING: BREAKING A TASK INTO SUB-TASKS

Understanding the problem and generating a workflow.

ASSIGNING TASKS TO SUB-AGENTS

Coordinating the sub-agents (orchestration).

WORKFLOW EXECUTION

Executing the tasks in different paradigms: (Loops, Sequence, Parallel)

INTERPRET THE RESULTS AND GENERATE OUTPUT

Evaluate the output and deliverables of each agent, and generate the objective production.

FUTURE?

Are these agentic systems a significant step toward AGI, or merely another step in a much longer journey?

A GUESS: COMPUTER SIMULATION

The intersection of computer simulation and AI is the future of decision-making and policy optimization. To harness its full potential, we must view complex problems from fresh perspectives and resist the urge to oversimplify, because even small, neglected parameters in a model can meaningfully alter outcomes.

THANKS!

Any questions?