Hands-On GenAI: LLMs, RAGs, and Agentic Systems for Beginners

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Agenda

Introduction, and interaction

History of AI and ML, a timeline

Decoding meanings of common terms

Course outline and logistics

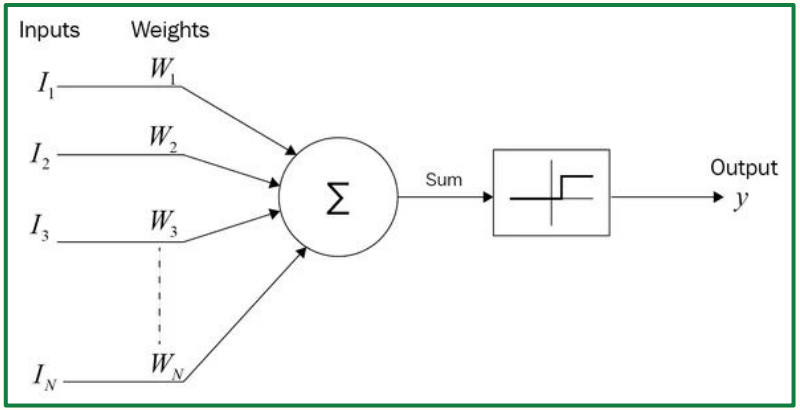
What does an Agent look like?

Introduction

Now, your turn!

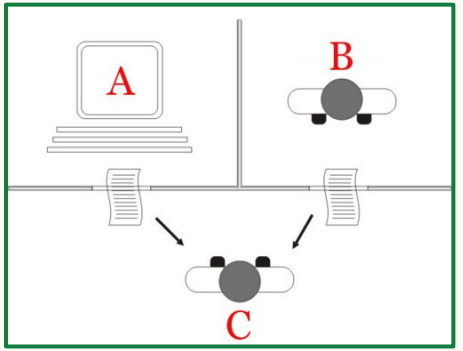
History of AI and ML- A Timeline

- 1914 The first chess playing machine
- 1921 The first time ‘Robot’ was used in English, to describe an artificial, mechanical system
- 1939 The first Digital computer machine (ABC machine)
- 1943 The McCulloch-Pitts (MCP) neuron was formulated, inspired by the biological neuron.



Source: https://www.analyticsvidhya.com/blog/2024/07/mcculloch-pitts-neuron/

1950 Alan Turing published his famous research paper on “Can machines think?”, the Turing test This led to the ideas of defining thinking in machines, and intelligence

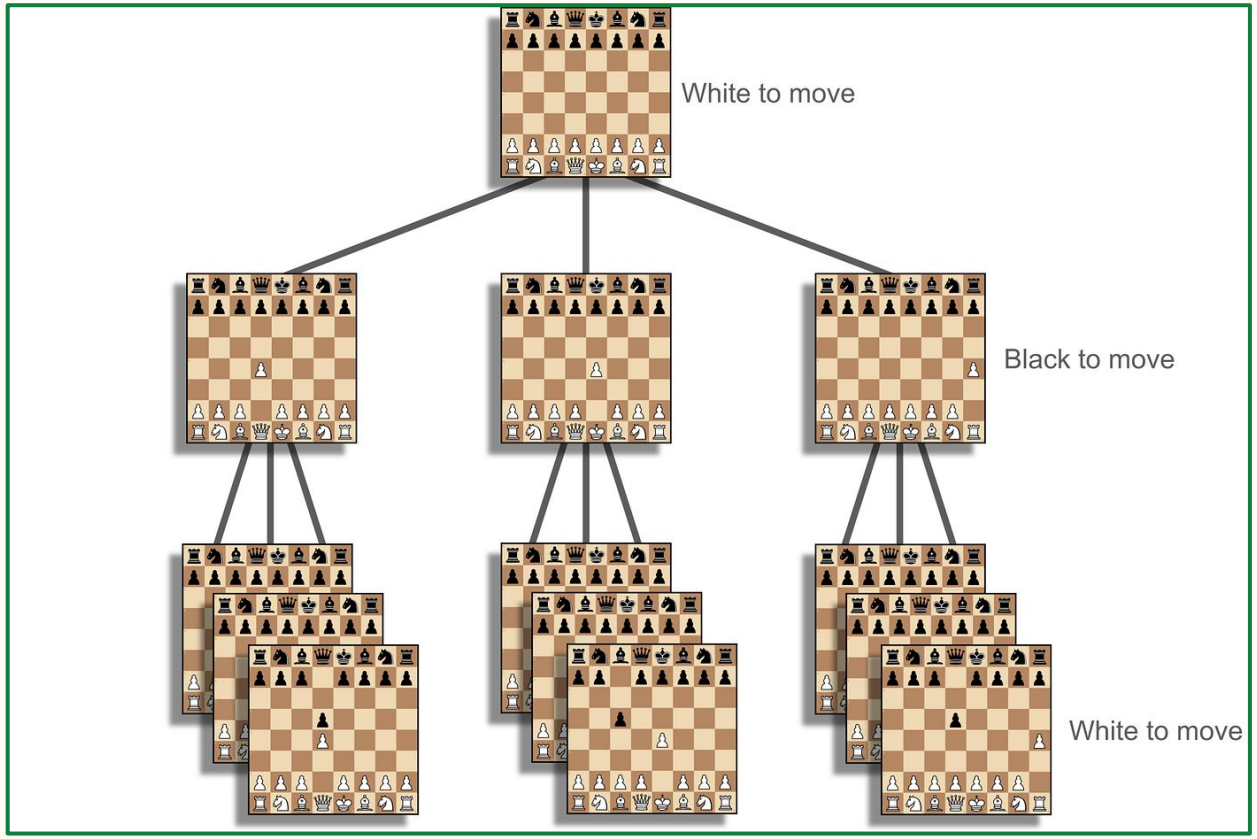


Source: https://en.wikipedia.org/wiki/History_of_artificial_intelligence

1951 The Artificial Neural Network was discovered.

1951-today The expanse of Artificial Intelligence and Machine Learning today comprises of:

- diverse areas of study: Natural Language Processing, Image Processing, Audio Processing
- groundbreaking breakthroughs: Backpropagation (1986), Convolutional Neural Networks (1989), Recurrent Neural Networks (1997)
- foundation of autonomous systems: chatbots, agents, self-driving cars, surveillance drones, autonomous financial systems



Source: https://www.chess.com/blog/Rinckens/how-does-the-deep-blue-algorithm-work

handcrafted rules

heuristic functions

search algorithms

extensive database of openings and strategies

DeepThought
half a billion chess positions per move in tournament games, which is sufficient to reach depth of 10 or 11 moves ahead in complex positions.

Chess AI

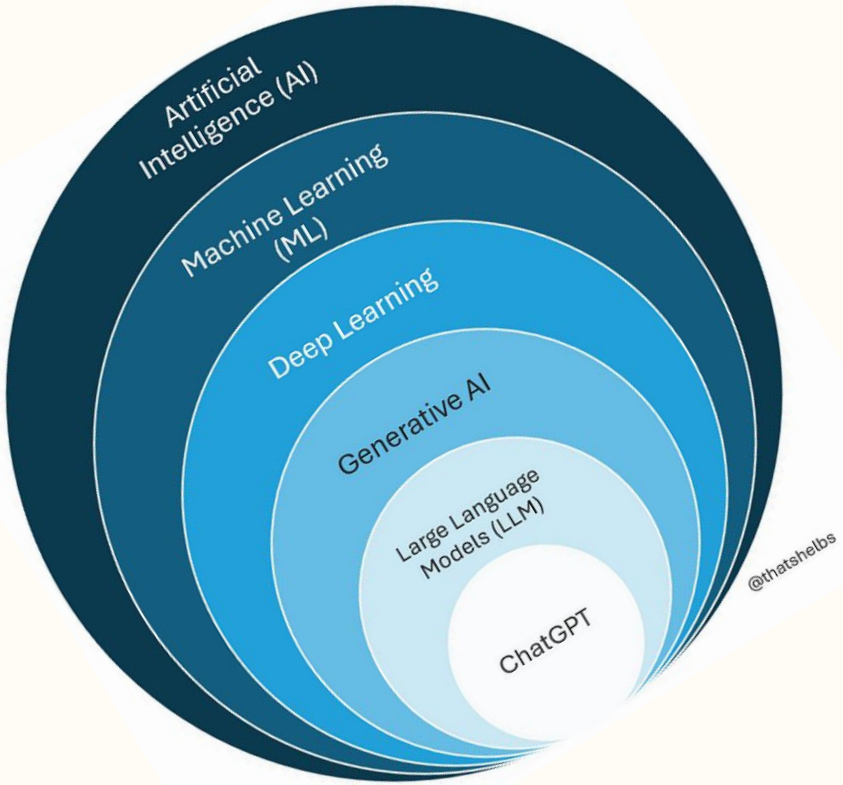
deep learning/ neural networks (StockFish)

reinforcement learning by training model on games against itself (AlphaZero)

transformer trained on human game records (Allie)

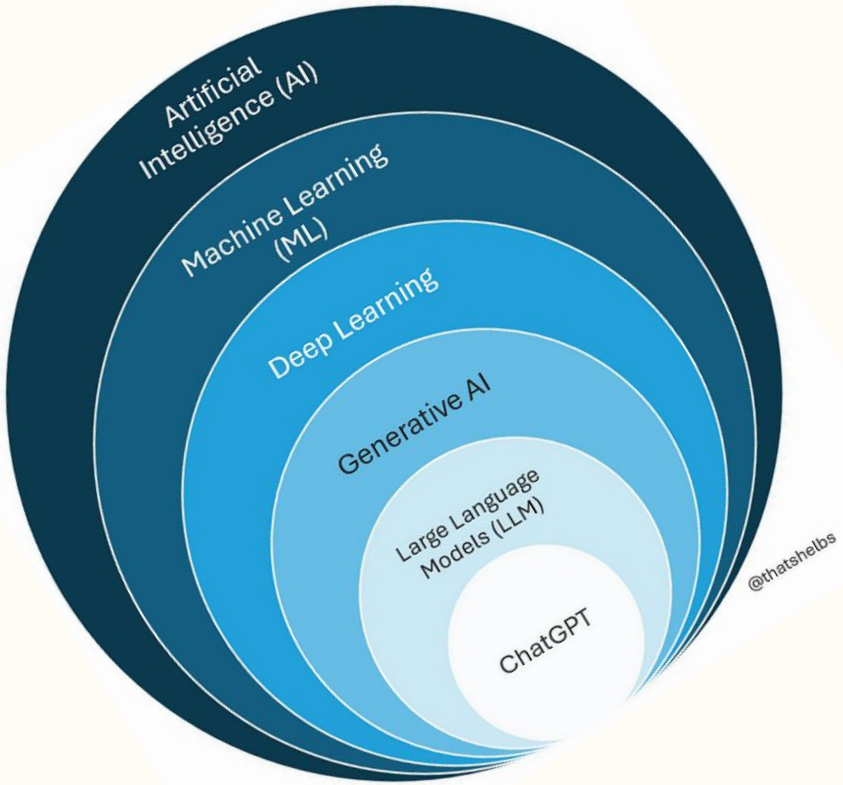
ML Chess

Decoding meanings of some common terms



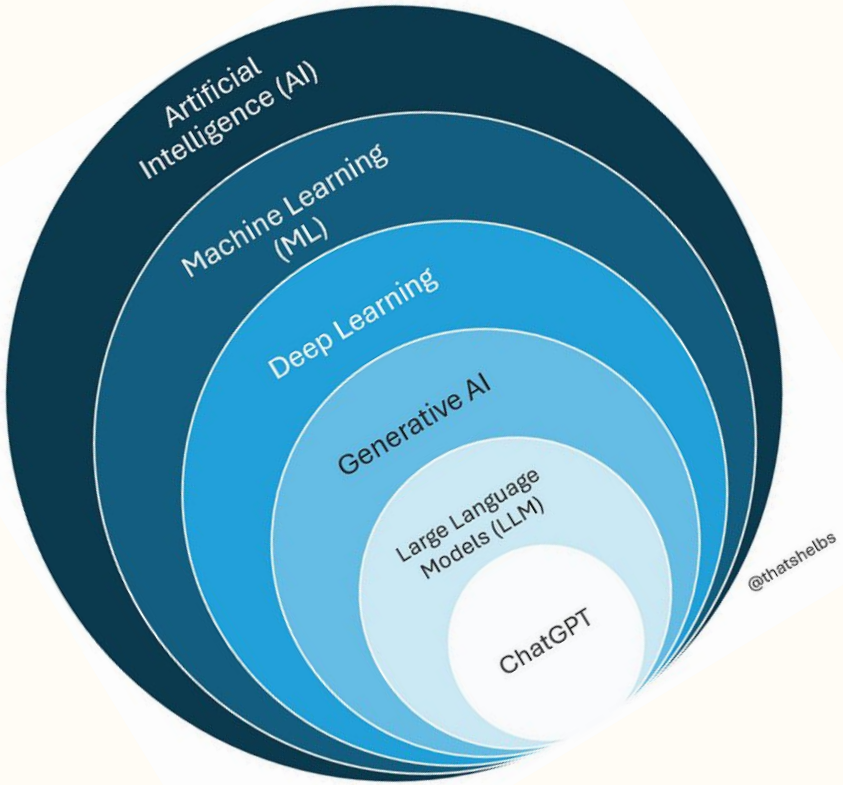
Artificial Intelligence

The broad field of making machines mimic human intelligence, from rule-based systems to problem-solving. It's the "umbrella" under which all else sits.



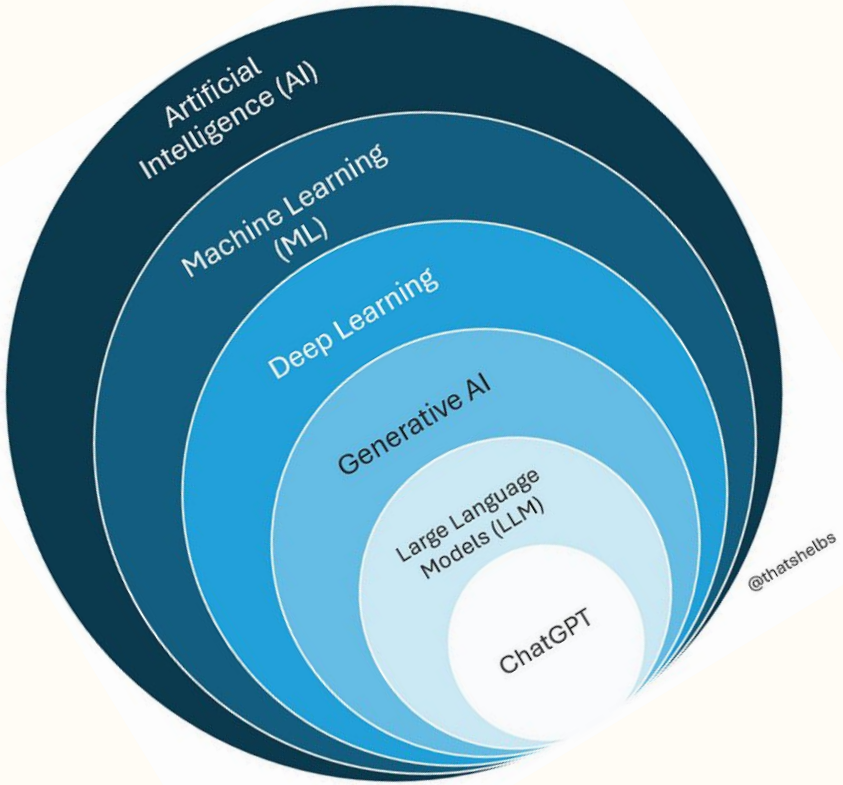
Machine Learning

A subset of AI where machines learn patterns from data instead of being explicitly programmed. Think of it as “experience-driven improvement.



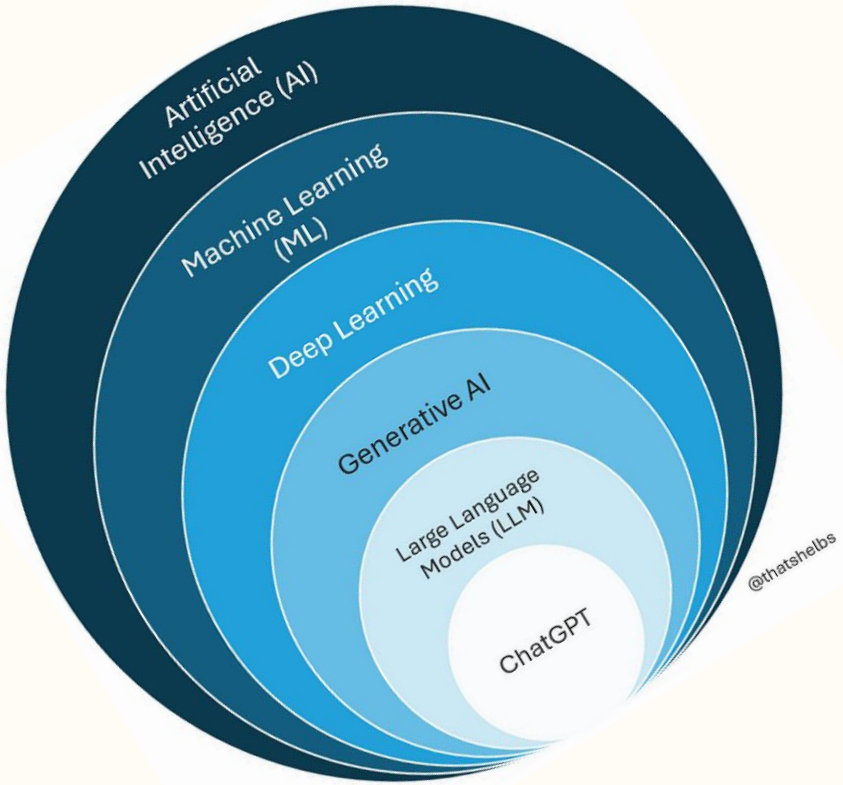
Deep Learning

A subset of ML using neural networks with many layers to automatically learn complex patterns (like vision, speech, text). It powers most modern breakthroughs.



Generative AI

Models that don’t just classify or predict but create—generating text, images, code, and music from patterns they’ve learned.



Large Language Models

A type of GenAI trained on massive text datasets using the Transformer architecture, capable of understanding and generating human-like language.

What is Agentic AI?

Agentic AI = LLMs + memory + goals + tools.

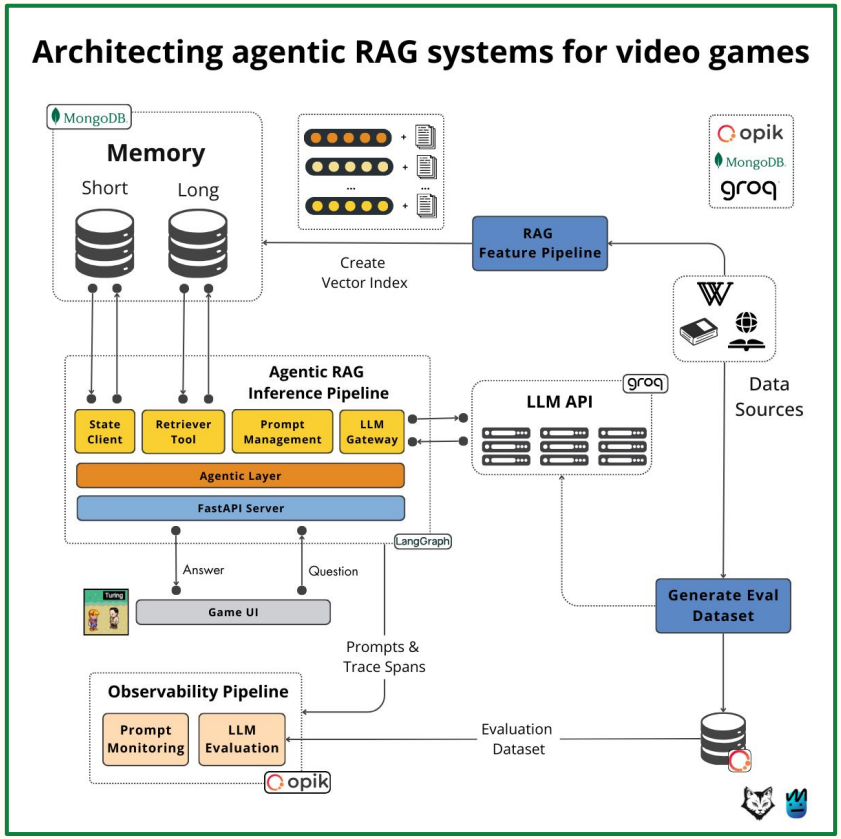
Instead of being just chatbots, they become autonomous problem-solvers.

Give examples:

AutoGPT planning a research task step by step.

A shopping assistant: searches web, compares prices, books order.

A warehouse agent: checks stock, requests restock, notifies suppliers.



Source: https://decodingml.substack.com/p/from-0-to-pro-ai-agents-roadmap

An AI Agentic System

Course Outline

1. Syllabus and Course Plan
2. Style of teaching
3. Deliverables
    a. assignments
    b. project
4. Attendance
    a. 75% (will confirm)
5. Class Timings
    a. 4 to 6 generally

Join this group now :)

What does an Agentic Application look like?

Thank You!