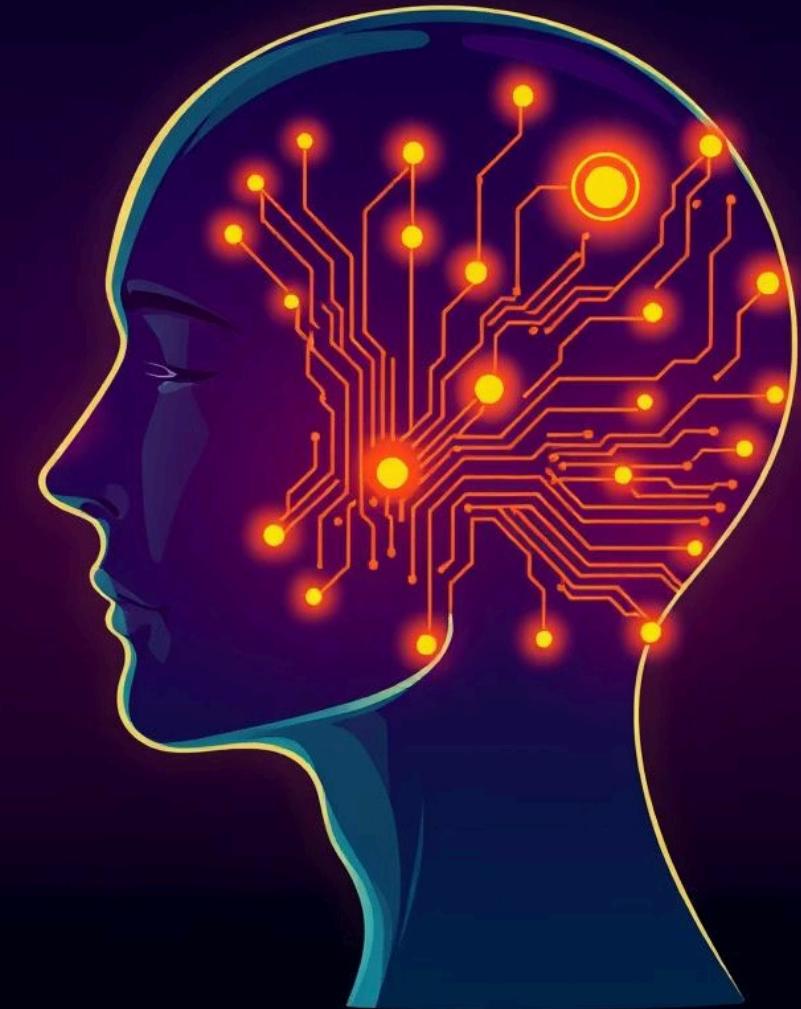


AI in Action: History, Algorithms & Game Projects

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Artificial Intelligence Course

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What is Artificial Intelligence?

AI is about creating machines that can think, learn, and make decisions like humans.

Core Goal

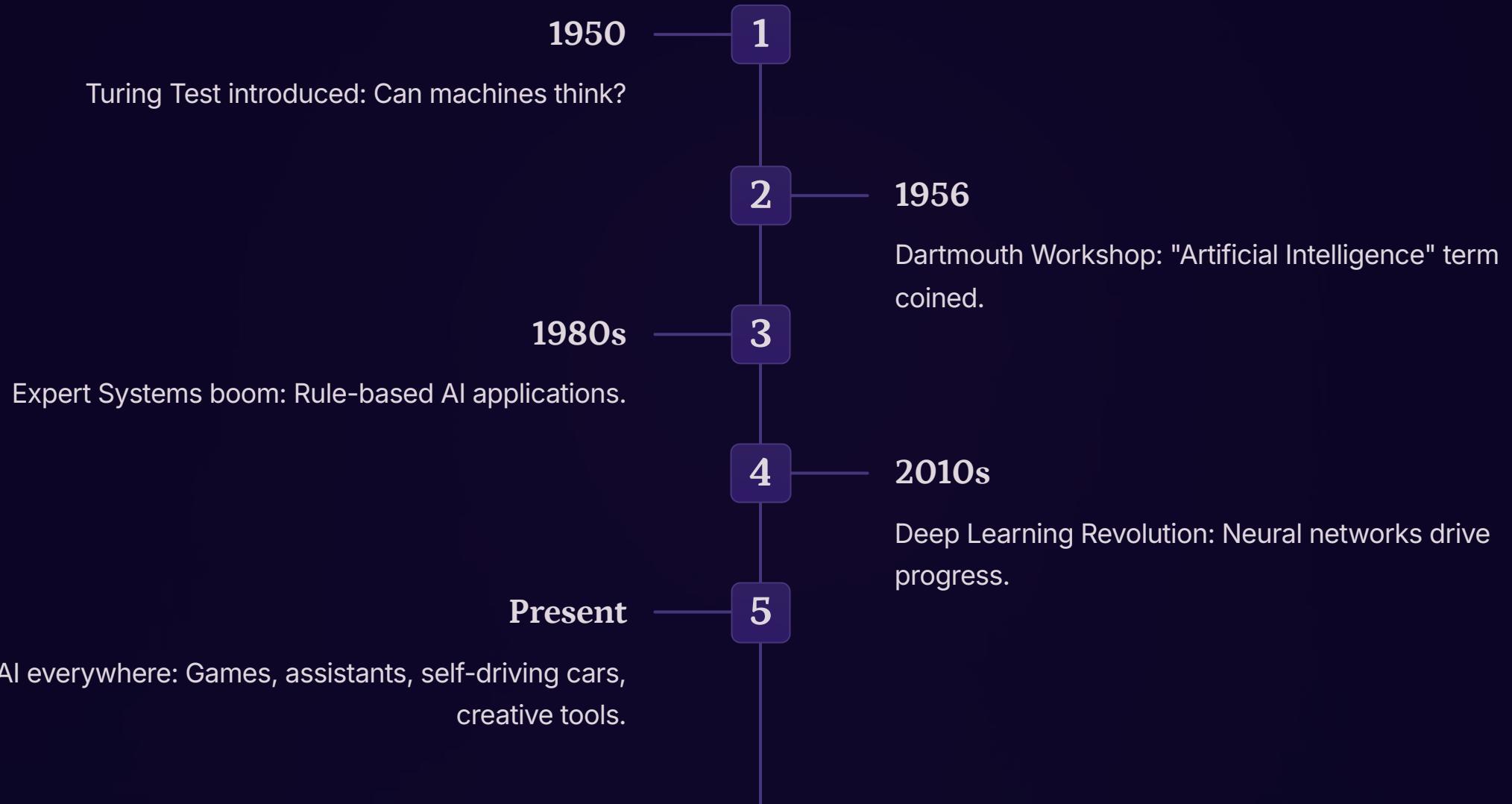
Enable machines to simulate human intelligence and problem-solving.

Why it Matters

Automates tasks, enhances decision-making, and discovers new insights.



Brief History of AI



AI in the Real World



Google Maps

Pathfinding algorithms find optimal routes.



Recommendation Systems

Netflix, Amazon suggest content you'll love.



Game AIs

Opponents in Chess, Tic Tac Toe, video games.



Self-Driving Cars

Perception, decision-making, navigation.

Types of Search in AI

Uninformed Search

No domain knowledge; explores systematically.

Informed Search

Uses heuristic functions to guide search.

Local & Adversarial Search

Optimizes in local space or plays against an opponent.

Uninformed Search Algorithms

Explore without prior knowledge, systematic but can be slow.

1

BFS

Breadth-First Search: Explores level by level.

2

DFS

Depth-First Search: Explores as deep as possible.

3

Iterative Deepening

Combines DFS depth-limit with increasing depth.

4

Bidirectional

Searches from both start and goal simultaneously.

Informed Search Algorithms

Use **heuristics** (rules of thumb) to make smarter choices.

Heuristic Search

Estimates cost to goal, guides path selection.

Best-First Search

Always expands the node closest to the goal.

A* Algorithm

Combines cost to reach node + estimated cost to goal.

AO* Algorithm

AND-OR graph search for complex problems.

Manhattan Distance: Sum of absolute differences of coordinates to the goal.

Local & Adversarial Search

Local Optimization

Hill Climbing: Moves towards better states locally.

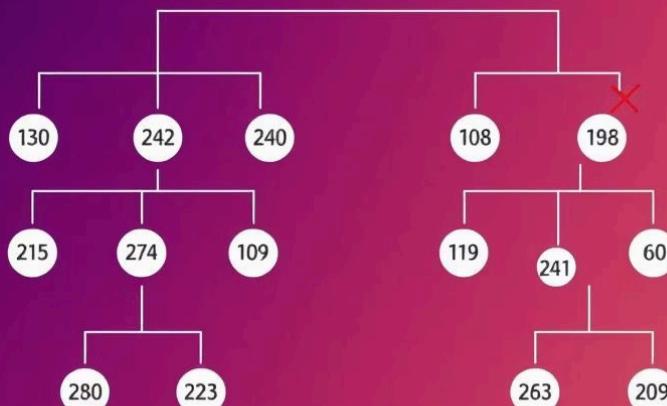
Beam Search: Explores best 'k' states at each step.

Game Theory

Min-Max: AI chooses move to maximize its score, assuming opponent minimizes it.

Alpha-Beta Pruning: Optimizes Min-Max by cutting off branches that won't affect decision.

Minninxig game Ttrre



alpha–beta.., baa Prninanlg

What I Learned from This AI Course



AI Algorithms Deep Dive

Explored various search algorithms (BFS, DFS, A*, Min-Max) and their applications.



Enhanced Problem-Solving

Developed systematic approaches to tackling complex computational challenges.



Game AI Implementation

Applied AI concepts to create intelligent agents for games like Tic-Tac-Toe and Connect Four.



Practical Python Skills

Strengthened programming proficiency through hands-on AI project development.

The Road Ahead for AI

As we conclude, it's clear that Artificial Intelligence is not just a field of study, but a transformative force shaping our world. From optimizing daily tasks to revolutionizing industries, AI's potential continues to expand.

The journey through its history, algorithms, and practical applications in games has highlighted the intricate balance between human ingenuity and machine capability. We are just at the beginning of understanding the full extent of what AI can achieve, making it a critical and exciting area for continued exploration and innovation.



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THANK YOU