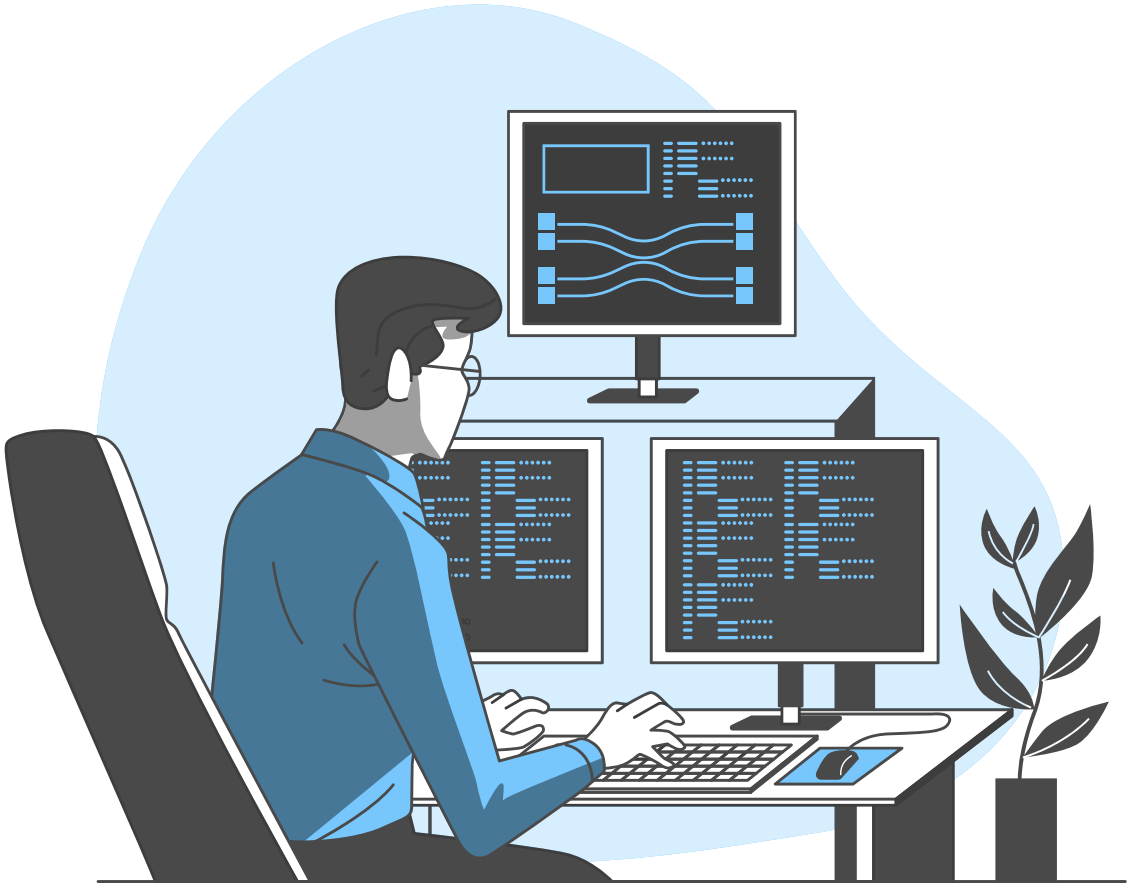


Artificial Intelligence Introduction

01
Definitions

1. The ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings

...

2. The design of computer algorithms that reproduce human behavior

3. The design of computer algorithms that behave rationally with respect to a desired outcome

4. A study of how human brains think, learn, decide and work, when they try to solve problems

02
Rational Agents

Let's go back to definition 3: AI is the design of computer algorithms that behave rationally with respect to a desired outcome

What does is mean to behave rationally?

...

To select actions that maximize positive outcomes or gains

Agents

...

An agent is a system (an algorithm) that perceives the environment and can change it and act in it

Rational Agents

...

Rational agents make decisions in their environments that maximize utility

Different rational agents have different techniques for reaching their goal

01

Reflex agents

Map from their current position in the environment to an action without considering future actions.

02

Planning agents

Make decisions based on the consequences of their actions, they have a model of how the environment will change based on their actions

03

Goal based agents

Make decisions based on how far they are from their goal

04

Learning Agents

These have the ability to learn from their past decision, they are the most complicated

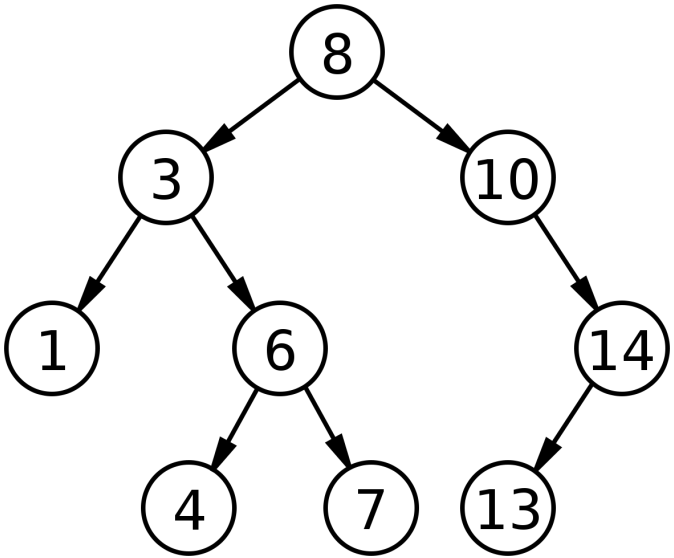
What kinds of problems can agents try to solve?

Search Problems

AI agents can be used to search domains with the purpose of reaching the goal.

The agent knows the space they are searching, what the problem is, and what the solution is, they are just trying to find it.

We'll talk about some search strategies in the coming lectures

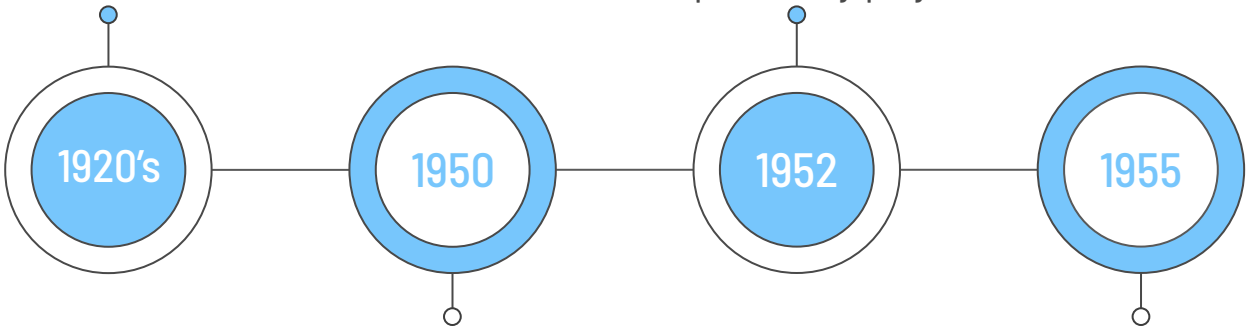


An example of a problem space. The goal may be finding the number 7.

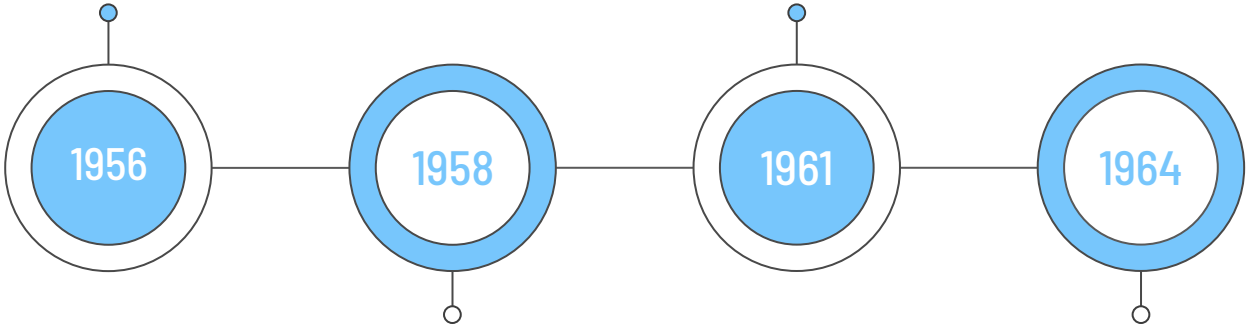
03

History of artificial intelligence

1920's-1955


Plays and movies had mentions of robots and robotics
1920's
The Turing test measured machine intelligence
1950
Arthur Samuel created a checkers playing computer program that independently played
1952
Allan Newell, Herbert Simon, and Cliff Shaw made the Logic Theorist, the first AI computer program
1955

1950's-1960's



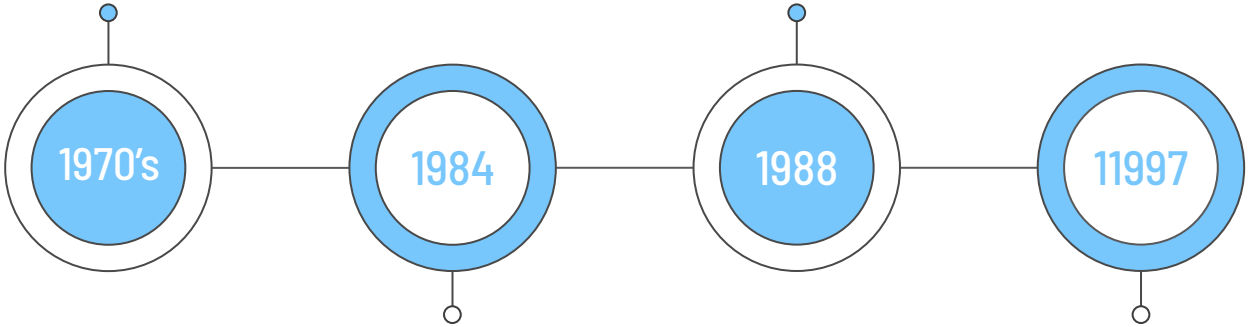
The name artificial intelligence is adopted for the field of study

McCarthy created Lisp, a programming language for AI research

Unimate becomes the first industrial robot to work on a General Motors assembly line

Daniel Bobrow used LISP to write a program that solved algebra word problems

1970's-1990's



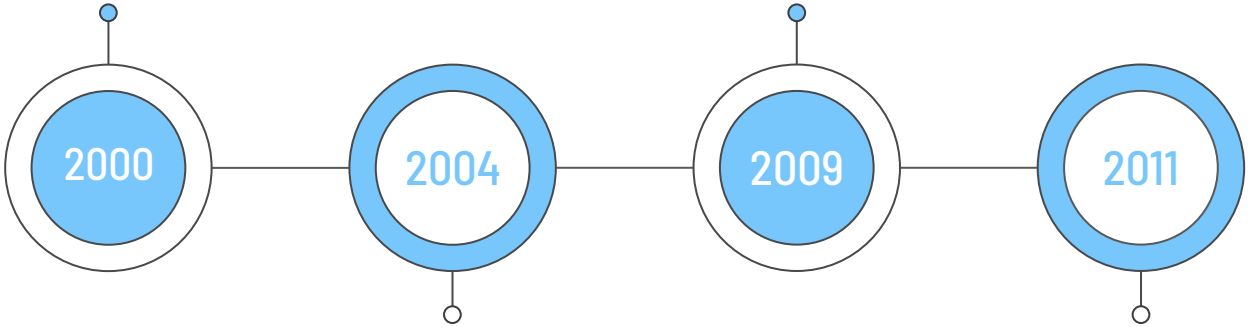
More robots and programs were created

First mention of the "AI winter", the notion that interest and funding in the field would decrease soon

Rollo Carpenter created a chatbot that simulates human conversation in an entertaining way

Deep Blue, a chess playing computer, won a chess game against a world champion

2000's-2011



Cynthia Breazeal developed Kismet, a robot that simulates emotions. Honda developed ASIMO, a humanoid robot.

Google developed a driverless car that passed Nevada's self driving test

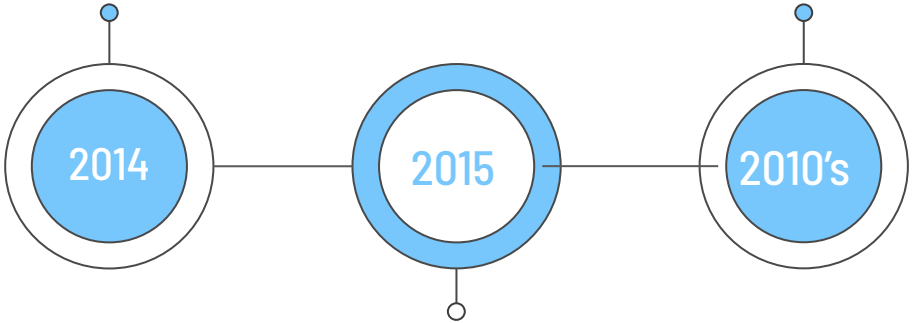
NASA's Mars rovers operate without human intervention

IBM's Watson defeated two former Jeopardy champions. Apple released Siri, which uses a natural language interface.

2011–Present

Amazon created the Alexa home assistant

Age of big data increases the ability of computers to learn



Google DeepMind's AlphaGo defeated Go champions

What's next?

Next we are going to learn a little bit about search problems and solving them as an introduction to AI problem solving. Then we'll talk a little bit about the advanced AI concepts that make the popular notions of AI possible.