

CUTTING-EDGE TECHNOLOGY

# ARTIFICIAL INTELLIGENCE



# EPIC

Action and adventure collide in **EPIC**. Plunge into a universe of powerful beasts, hair-raising tales, and high-speed excitement. Astonishing explorations await. Can you handle it?

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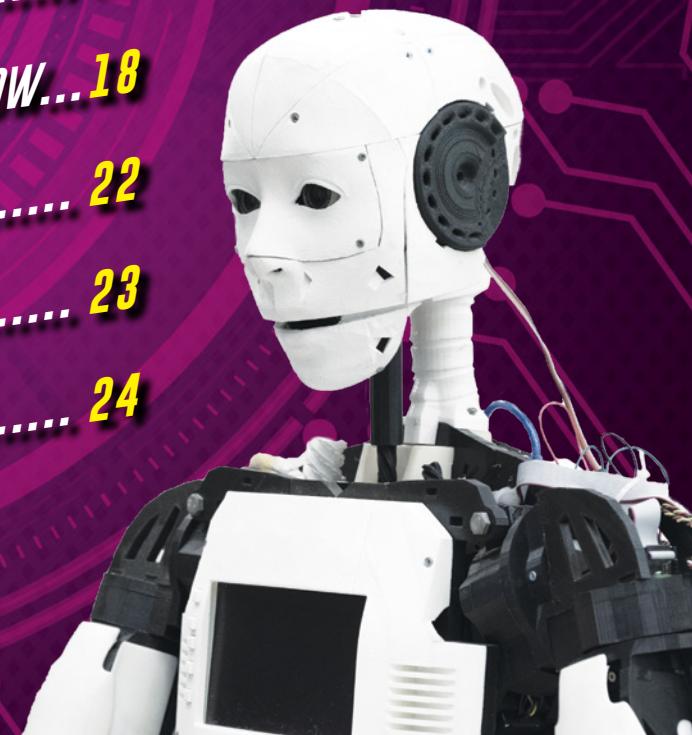
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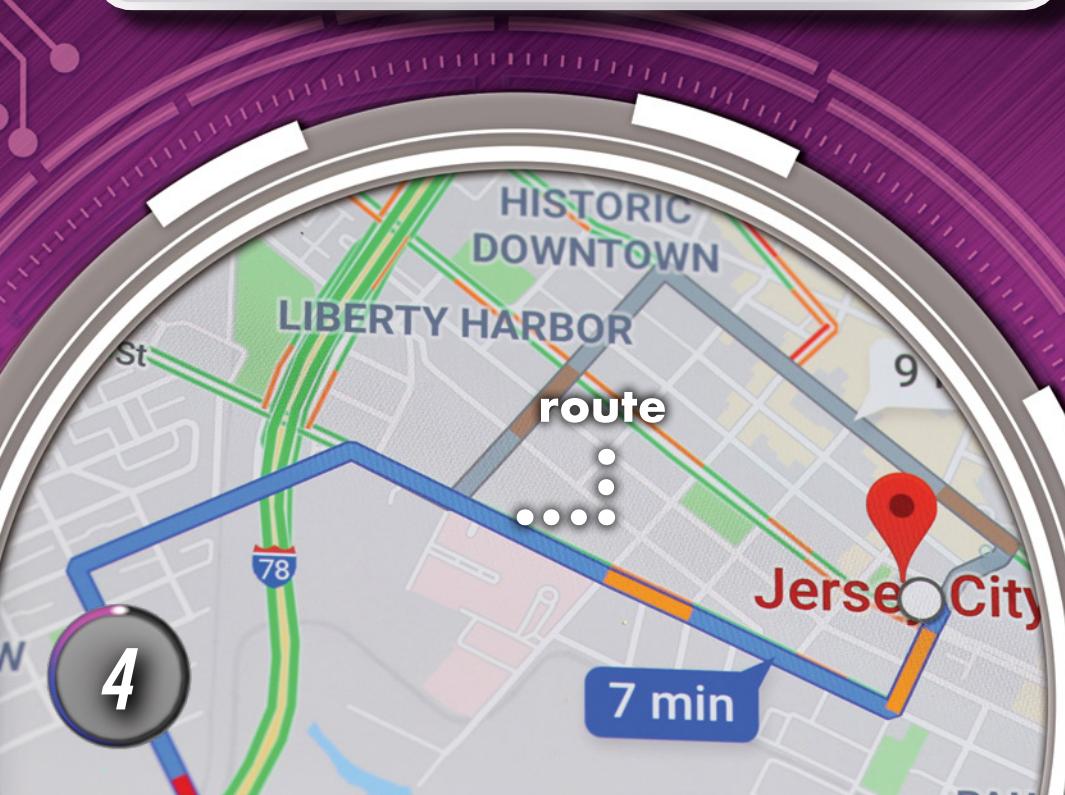
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# LOST AND FOUND

A traveler stands on a busy street corner.  
He is lost. But his phone's map **app** will help.  
**Routes** appear on the screen.  
The traveler chooses the fastest one.  
Artificial intelligence helps him find his way!



A photograph of a young man with dark hair and a beard, wearing a blue baseball cap and a light blue button-down shirt over a white t-shirt. He is standing outdoors, looking down at a black smartphone he is holding in his right hand. His left hand is resting against his forehead. In the background, there's a red building with some greenery and a blurred city street.

# SMART PHONES

Smartphone users use AI every day. Phones do voice searches. They suggest routes. They can even recognize faces!

smartphone



# WHAT IS ARTIFICIAL INTELLIGENCE?

Artificial intelligence is a computer technology. It is also called AI. It allows computers to learn and make decisions.

hospital AI

Hello  
How are you today?

# WHO USES IT?



health workers



police



stores



teachers

AI is found in classrooms and hospitals. It is even found on smartphones!

# HOW IT WORKS

Most AI is made to do a certain job.  
**Programmers** give it a set of steps  
called an **algorithm**.  
People **input** questions or requests.  
The AI follows the steps to do its job!



programmer

A photograph of a man sitting on the floor, looking down at a white and blue programmable robot. The robot has a white torso with blue glowing eyes and a green glowing mouth. It has white arms and legs with blue glowing hands and feet. A black cable is connected to its left arm. In the background, there are hexagonal patterns and a yellow tape measure on the floor.

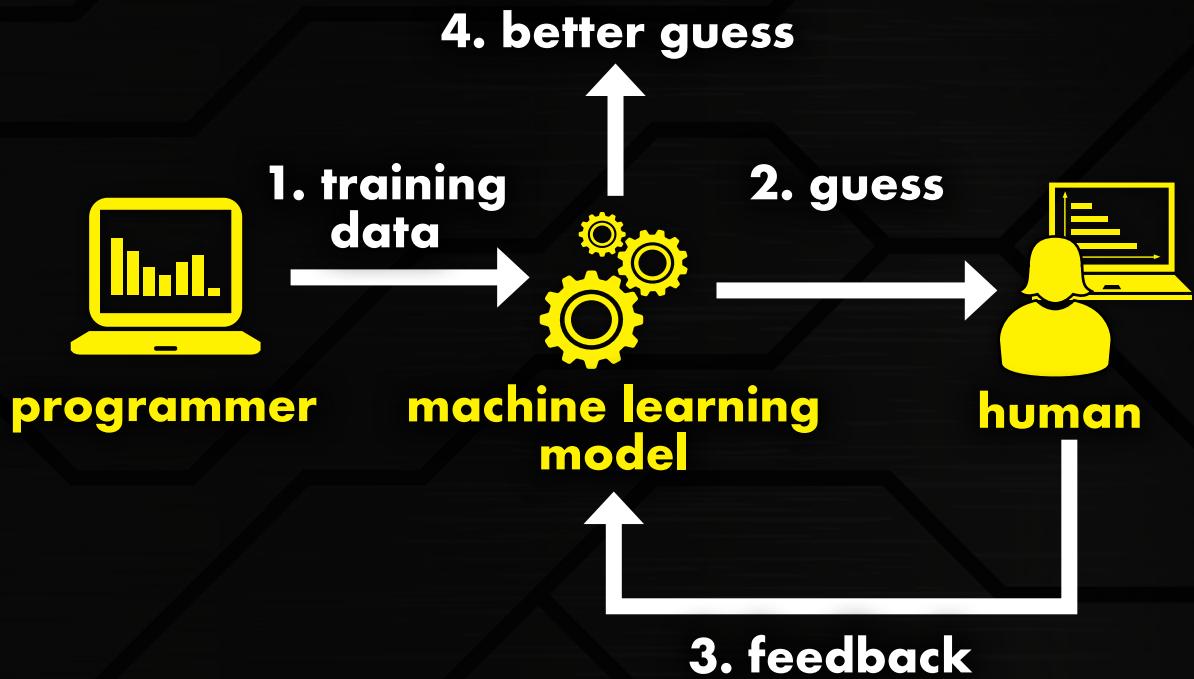
**programmable  
robot**

Some AI uses **machine learning**.  
Programmers teach it with training  
**data**. The AI creates a **model**.  
This helps it make guesses.

More data is added. AI uses it  
to make better guesses!



# HOW MACHINE LEARNING WORKS



## DEEP LEARNING

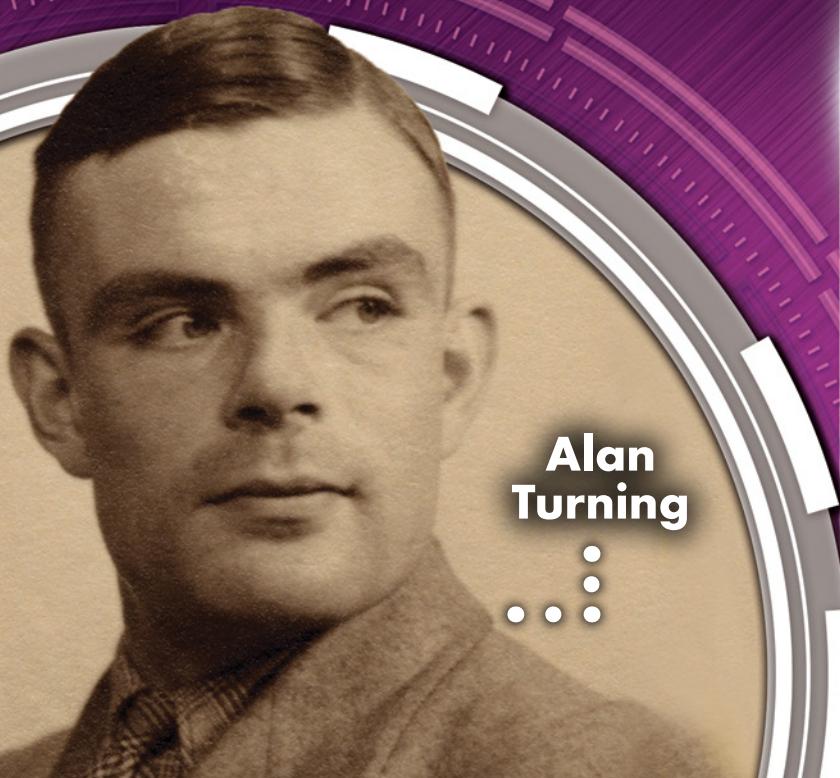
Deep learning is machine learning. But it uses much more data. It allows AI to teach itself!



# HISTORY

Alan Turing wrote about “thinking machines” in the 1930s. This led to AI research!

Marvin Minsky researched AI in the 1950s. He thought AI should be pre-programmed. This **top-down AI** was built with all the information it needed.



Alan  
Turning

...



**Marvin  
Minsky**



## TOP DOWN TALKING

Top-down AI is useful for simple tasks. For example, it might understand speech. But it does not always understand slang!

# ARTIFICIAL INTELLIGENCE TIMELINE



1930s

Alan Turing writes about "thinking machines"



1952

Christopher Strachey creates the first working AI program



1950s

Marvin Minsky leads research on top-down AI



1955

John McCarthy is the first to use the term "artificial intelligence"

Things changed in 1990. Rodney Brooks thought AI should use **neural networks**. They connect thousands of computers!

**2010**

IBM's Watson computer is introduced



WATSON

**1990**

Rodney Brooks makes bottom-up AI popular



**2020**

Researchers use AI to detect cancer better than doctors



**1996**

Deep Blue chess computer beats a human chess champion



**2017**

Deep learning AI creates thousands of realistic cat pictures



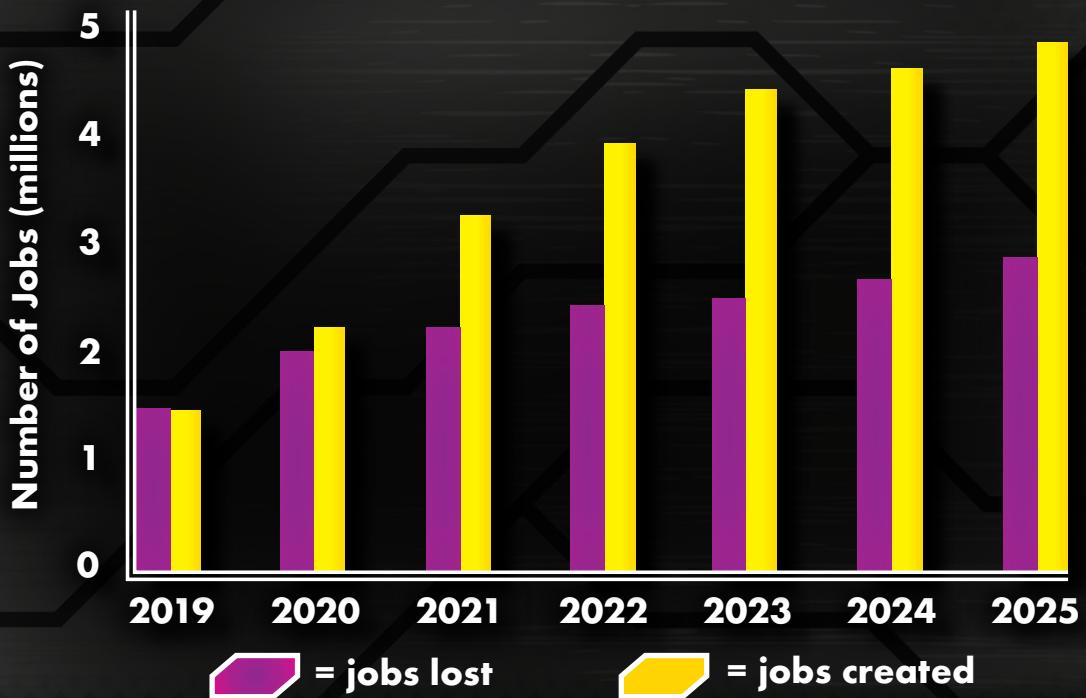
Research on this **bottom-up AI** led to many new technologies.

AI continued to get better.  
In 2010, IBM's Watson computer  
used bottom-up AI. It answered  
questions and made decisions.



# AI AND JOBS

Do scientists think AI will lead to more jobs lost or more jobs created?



In 2012, AI got creative.  
The Iamus computer wrote a  
piece of music!

# ***TECHNOLOGY OF TOMORROW***

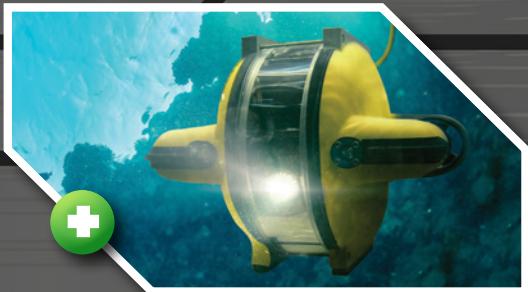
More AI advances are around the corner. AI may help cars drive themselves. It may help doctors find diseases faster.

AI may help scientists explore the deep ocean. It may even help humans explore planets beyond our own!



# PROS AND CONS

## Pros



helps humans explore



makes jobs easier



helps doctors treat patients

## Cons



could become too powerful



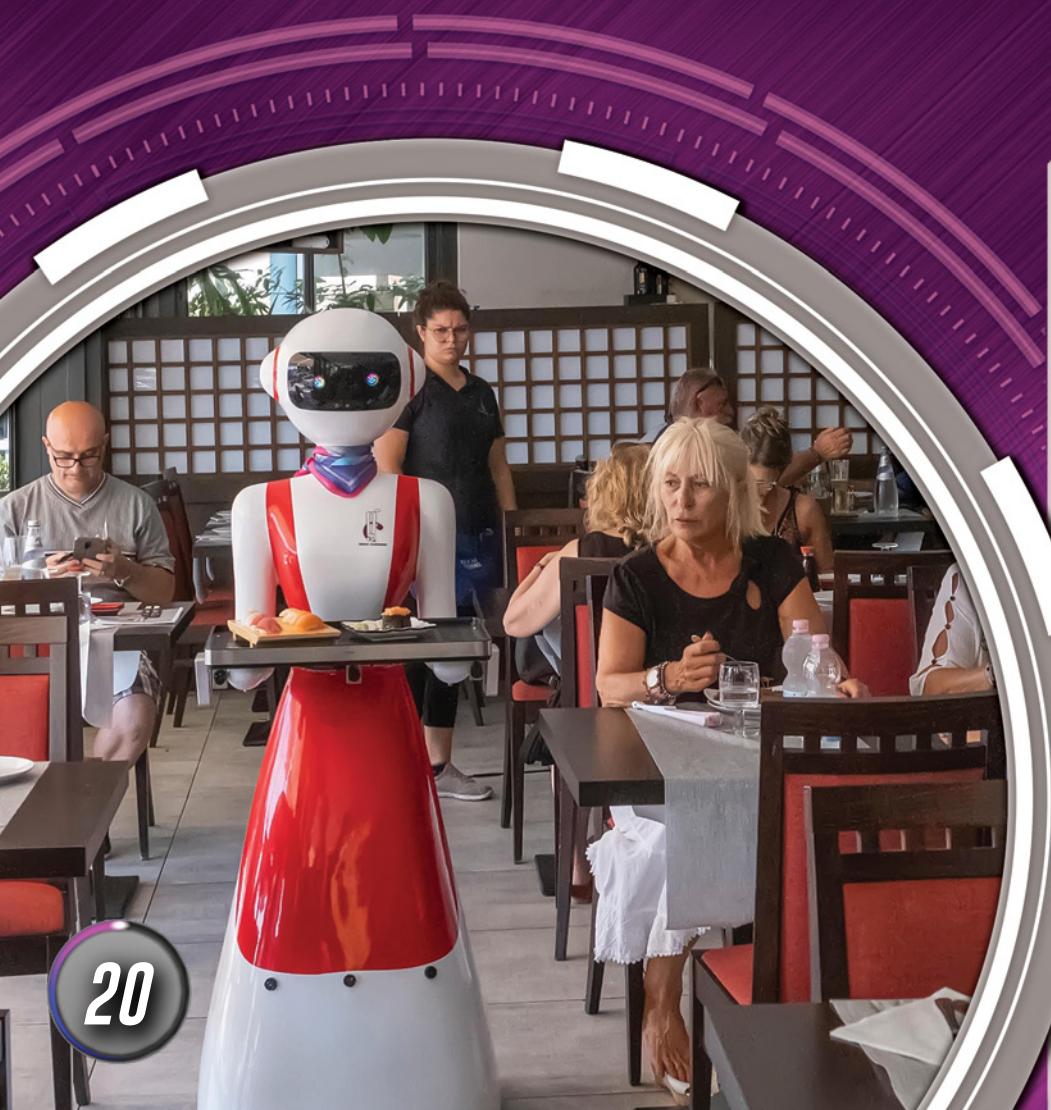
could take away privacy



could take away jobs

Some researchers worry about AI advances. It could leave people without jobs. It could also make data less private.

Artificial intelligence is here to stay. How will it change the world?



## AI TAKEOVER?

AI may become smarter than people. But it may not have feelings like people. Some researchers think this is dangerous for humans!



# GLOSSARY

**algorithm**—a set of steps that a computer follows to do its job

**app**—a small, specialized program downloaded onto smartphones and other mobile devices

**bottom-up AI**—a type of AI in which computers teach themselves from huge amounts of data

**data**—information

**input**—to put data into a computer

**machine learning**—a process through which computers are able teach themselves by adding new data to data they already know

**model**—an example used by an algorithm to make future guesses based on data learned in the past

**neural networks**—groups of many connected computers; neural networks are designed to work like human brains.

**programmers**—people who create and test programs for computers

**routes**—ways taken to get to other places

**top-down AI**—a type of AI in which computers are pre-programmed with the data that will help them do their jobs

# **TO LEARN MORE**

## **AT THE LIBRARY**

Dickmann, Nancy. *Robots and Artificial Intelligence*. New York, N.Y.: Gareth Stevens Publishing, 2020.

Enz, Tammy. *Artificial Intelligence and Entertainment*. North Mankato, Minn.: Capstone Press, 2019.

Gregory, Josh. *Artificial Intelligence*. Ann Arbor, Mich.: Cherry Lake Publishing, 2018.

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