

Robotic hand solved Rubik's Cube in 20 moves, compared with 50 for humans

By Washington Post, adapted by Newsela staff on 01.07.20 Word Count **661** Level **830L**



Image 1. This robotic hand learned to solve a Rubik's Cube on its own — just like a human. Photo courtesy: OpenAl/The Washington Post

Solving a Rubik's Cube is hard. Try solving it one-handed.

If that's not hard enough, try making a robot that can solve a Rubik's Cube by itself with one hand.

The robot would need skill and coordinated finger movements never seen before on machines. It would also need to be able to learn a new task on its own like humans do.

This week, computer scientists at OpenAI announced they'd done this. OpenAI is a popular research lab in San Francisco, California. They focus on making helpful artificial intelligence. Artificial intelligence is also called AI. AI is a type of computer science that develops machines and programs that have similar intelligence to humans.

One-Handed Robot Solves Rubik's Cube

OpenAI said it has created the first robot to solve a Rubik's Cube one-handed. People who work for the company named the robotic hand "Dactyl." This means finger. The employees say Dactyl's

ability moves robots closer to the agility of humans.

OpenAI released information about how difficult it is to solve a Rubik's Cube.

"Even for humans, solving a Rubik's Cube one-handed is no simple task," OpenAI's said. There are over three dozen quintillion ways to scramble a Rubik's Cube.

OpenAI said Dactyl brings computer scientists closer to creating "general-purpose robots." These kinds of robots can learn any human task.

A Rubik's Cube is a multicolored, 3-D puzzle. It has challenged game-playing humans since the 1970s. Rubik's Cubes are also a useful tool for measuring the capabilities of artificial intelligence.

There are billions of possible moves for a Rubik's Cube player. There is only one goal, though. To solve it, each of the cube's six sides must show only one color.

The Ability To Form A Mental Image

Finding a solution to a puzzle with that many different possibilities is very hard. It involves the ability to form a mental image. The player must imagine possibilities that aren't actually in front of them. Computer scientists say a computer that can do that starts coming close to humans' ability to reason and make decisions.

For years now, scientists have been creating robots to solve Rubik's Cubes. The goal has been for robots to solve it as quickly as possible. More recently, they have stopped focusing on speed. They want computers to be able to learn on their own.

In July, the University of California at Irvine (UCI) announced that an AI system solved a Rubik's Cube in just over a second. It was more than two seconds faster than the current human world record. It solved the puzzle without knowing the game or getting help from humans, the university said.



Highly skilled humans can solve a Rubik's Cube in

about 50 moves. Meanwhile, AI systems can solve it with far fewer moves. They can do it in about 20 moves.

The machine is designed to find patterns by copying how the human brain uses information. It uses calculations and errors to learn how to improve. The machine needs very little help from humans.

Learning The Way Humans Do

The scientists wanted to create a robot that can learn the way humans do. People learn by trying new things and learning from their mistakes. Then they try again. Their goal was to make a robot that does a similar thing.

If robots can learn this way they could complete various tasks by themselves. They could work in a warehouse or perhaps on a new planet.

OpenAI posted a video of Dactyl on YouTube. It showed the robot hand at various points during its training. The video captures the hand learning from the beginning as it awkwardly tries to solve a Rubik's Cube. Later, it starts handling the cube with much more control.

"The hope is to build robots that can do many different tasks," the video's narrator says. "And give everybody a better life."

Quiz

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- Which sentence from the article supports the MAIN idea of the article?
 - (A) OpenAl is a popular research lab in San Francisco, California.
 - (B) OpenAl said it has created the first robot to solve a Rubik's Cube one-handed.
 - (C) OpenAl released information about how difficult it is to solve a Rubik's Cube.
 - (D) There are over three dozen quintillion ways to scramble a Rubik's Cube.
- 2 Read the paragraph from the article.

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How does this paragraph support the MAIN idea of the article?

- (A) It demonstrates how some AI systems are helpful to humans.
- (B) It shows that some AI systems need help from humans.
- (C) It demonstrates how some AI systems are good for factories.
- (D) It shows that some AI systems have focused on speed.

According to the section "Learning The Way Humans Do," how did Dactyl solve the Rubik's Cube?

- (A) Dactyl solved a Rubik's Cube using two different speedy hands.
- (B) Dactyl solved a Rubik's Cube in a little over one second.
- (C) Dactyl started off quickly, made some mistakes, and then started to slow down.
- (D) Dactyl started off slowly, learned from its mistakes, and got better at it.
- 4 What effect did Dactyl have on the field of robotics?
 - (A) Dactyl showed that robots are closer to thinking like humans.
 - (B) Dactyl showed that robots are ready to work on other planets.
 - (C) Dactyl showed that robots can solve the Rubik's Cube very quickly.
 - (D) Dactyl showed that robots can never be "general-purpose" robots.

Answer Key

3

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