

The rise of Robotics and AI

Fueled by advances in computing power and connectivity, the fields of robotics and artificial intelligence have grown rapidly

1921
The term **robot** is first used by Czech writer Karel Capek



1939
Elektro, a humanoid robot, debuts at the World's Fair, smoking cigarettes and blowing up balloons



1948
William Grey Walter creates the first autonomous robot with complex behavior

1941

Isaac Asimov formulates the

Three Laws of Robotics:



A robot may not injure a human being or, through inaction, allow a human being to be harmed

A robot must obey orders given it by human beings except where such orders would conflict with the First Law

A robot must protect its own existence as long as such protection does not conflict with the First or Second Law



1950

Alan Turing publishes paper about the possibility of machines that think, develops idea known as the

Turing's Test.

It tests a machine's ability to "think" by answering a series of questions. In essence, **the tester must think the machine's answers are coming from a human**

1954

George Devol invents the first digitally operated and programmable robot

1951

Marvin Minsky builds the first neurocomputer, **SNARC**

1956

IBM 305, the first hard disk drive
5MB

1970

IBM 1330
100MB per pack

1985

IBM 0665, a 5.25" disk with
20-40MB

Minimize and maximize

Shrinking disk sizes and exponentially growing capacity help fuel robotics and AI

1956

Field of AI research founded at a conference at Dartmouth

1960

Frank Rosenblatt constructs **Mark I Perceptron**, a computer that learned new skills by trial and error

1968

Mobile robot "**Shakey**" is introduced. It's controlled by a computer the size of a room



1979

SCARA, an articulated robot arm, is developed for assembly lines

1972

Stanford researcher develops **PARRY**, designed to simulate a paranoid schizophrenic.

1974

Intel produces its second-generation 8080 general-purpose chips

1984

The **RB5X**, developed by General Robotics Corp., includes software enabling it to learn from its environment



1984

Doug Lenat and his team start **Cyc**, to codify millions of pieces knowledge that compose human common sense

1985

Jaron Lanier's VPL Research, Inc., sells first VR glasses and gloves; Lanier coins the phrase

virtual reality



1988

Researchers launch **Jabberwacky**, an AI chatbot designed to learn through conversation

Nope, I'm human.



1986

Honda creates the **E0**, the first of a series of humanoid robots that walk on two feet

1988

The first **HelpMate** service robot begins work at Danbury Hospital

1990
Tom Caudell coins the phrase
augmented reality



1990
iRobot® Corporation is founded, producing domestic and military robots



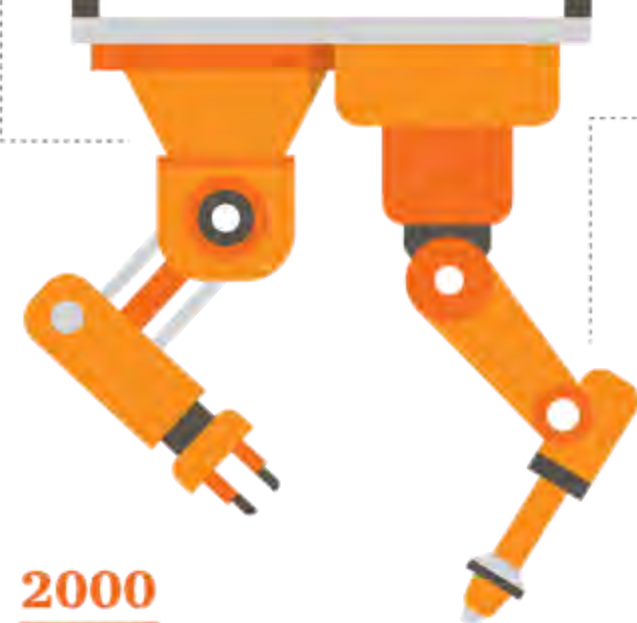
1998
Dr. Cynthia Breazeal creates **Kismet**, a robot that interacts emotionally with humans

2000
The UN estimates there are **742,500 industrial robots in use worldwide**

2005
Stanford robot **Stanley** drives autonomously for 131 miles



2007
Fanuc develops an industrial robot arm that can grab 120 items per minute



2006
IBM introduces **Watson**, a question-answering computer system that later defeated a Jeopardy! champion

2010
Google launches a **3D version of its Street View**



2004
Seagate ST1, 1" disk
2.5-5GB

2015
Seagate Thin HDD, 2.5", 7mm thick
2 TB

2025
Even smaller
100+ TB?



Growing capacities

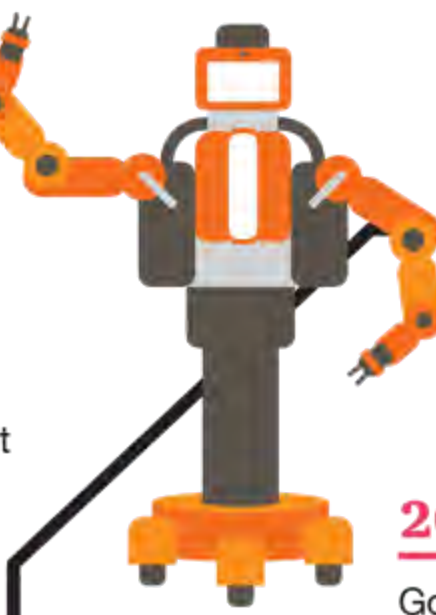
As disk size has shrunk, capacity has grown exponentially since 2000

2011
Siri is introduced



2012
Google introduces its Siri response: **Google Now**, which already has been rendered obsolete by Google Assistant

2012
Baxter, created by Rodney Brooks, can do light repetitive tasks



2013
Google launches **Google Glass**, augmented reality glasses



2015
Amazon launches **Alexa**, a "virtual assistant" that helps communicate with connected devices in the home



2016
Sony PlayStation launches **PlayStation VR**



2016
Uber begins testing driverless cars in California and Arizona

2016
Companies utilize an estimated **1.8 million industrial robots**

2016
Amazon makes first drone delivery in UK

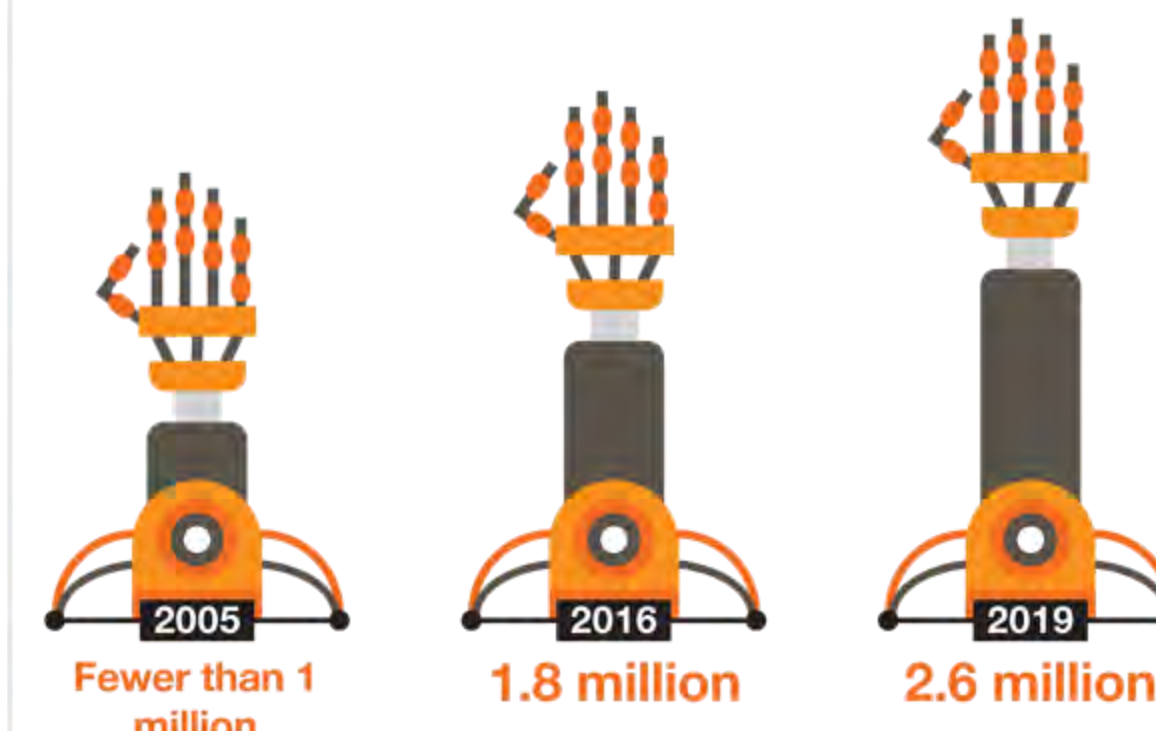


The FAA expects **7 million drones to ship in the US**, including 2.7 million commercial drones

2020
By 2020, the drone industry could be worth **\$127 billion**

Robotics and AI charging forward

With technologies advancing at breakneck speeds, robotics and artificial intelligence are finding new applications in factories, businesses, and homes



Industrial robots: looking forward

A common fixture in the factory, the industrial robot has reshaped the manufacturing landscape through the years by performing duties unsuitable for humans



Robotics and other computerization could replace **47 percent of U.S. jobs**, according to a 2013 University of Oxford study

2034