Artificial intelligence (AI) is a wide-ranging branch of computer science concerned with building smart machines capable of performing tasks that typically require human intelligence. Artificial intelligence (AI) makes it possible for machines to learn from experience, adjust to new inputs and perform human-like tasks. Most AI examples that you hear about today – from chess-playing computers to self-driving cars – depends on deep learning and [natural language processing](https://www.sas.com/en_us/insights/analytics/what-is-natural-language-processing-nlp.html). Using these technologies, computers can be trained to accomplish specific tasks by processing large amounts of data and recognizing patterns in the data.

1. [Alan Turing](https://en.wikipedia.org/wiki/Alan_Turing) wrote in 1950 "I propose to consider the question 'can machines think'?"[[159]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-FOOTNOTETuring19501-175) He advised changing the question from whether a machine "thinks", to "whether or not it is possible for machinery to show intelligent behaviour".[[160]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-FOOTNOTETuring1948-176) The only thing visible is the behavior of the machine, so it does not matter if the machine is [conscious](https://en.wikipedia.org/wiki/Consciousness), or has a [mind](https://en.wikipedia.org/wiki/Mind), or whether the intelligence is merely a "simulation" and not "the real thing". He noted that we also don't know these things about other people, but that we extend a "polite convention" that they are actually "thinking". This idea forms the basis of the [Turing test](https://en.wikipedia.org/wiki/Turing_test).[[161]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-Turing_test-177)[[q]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-179)
2. AI applications include advanced [web search](https://en.wikipedia.org/wiki/Web_search) engines (e.g., [Google](https://en.wikipedia.org/wiki/Google)), [recommendation systems](https://en.wikipedia.org/wiki/Recommendation_systems) (used by [YouTube](https://en.wikipedia.org/wiki/YouTube), [Amazon](https://en.wikipedia.org/wiki/Amazon_(company)) and [Netflix](https://en.wikipedia.org/wiki/Netflix)), [understanding human speech](https://en.wikipedia.org/wiki/Natural-language_understanding) (such as [Siri](https://en.wikipedia.org/wiki/Siri) and [Alexa](https://en.wikipedia.org/wiki/Amazon_Alexa)), [self-driving cars](https://en.wikipedia.org/wiki/Self-driving_car) (e.g., [Tesla](https://en.wikipedia.org/wiki/Tesla,_Inc.)), [automated decision-making](https://en.wikipedia.org/wiki/Automated_decision-making) and competing at the highest level in [strategic game](https://en.wikipedia.org/wiki/Strategic_game) systems (such as [chess](https://en.wikipedia.org/wiki/Chess) and [Go](https://en.wikipedia.org/wiki/Go_(game))).[[2]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-FOOTNOTEGoogle2016-4)[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia:Citation_needed)] As machines become increasingly capable, tasks considered to require "intelligence" are often removed from the definition of AI, a phenomenon known as the [AI effect](https://en.wikipedia.org/wiki/AI_effect).[[3]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-FOOTNOTEMcCorduck2004204-5) For instance, [optical character recognition](https://en.wikipedia.org/wiki/Optical_character_recognition) is frequently excluded from things considered to be AI,[[4]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-FOOTNOTEAshok832019-6) having become a routine technology.[[5]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-FOOTNOTESchank199138-7)
3. [Game playing](https://en.wikipedia.org/wiki/Game_AI) has been a test of AI's strength since the 1950s. [Deep Blue](https://en.wikipedia.org/wiki/IBM_Deep_Blue) became the first computer chess-playing system to beat a world chess champion, [Garry Kasparov](https://en.wikipedia.org/wiki/Garry_Kasparov), on 11 May 1997.[[150]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-FOOTNOTEMcCorduck2004480%E2%80%93483-165) In 2011, in a [*Jeopardy!*](https://en.wikipedia.org/wiki/Jeopardy!) [quiz show](https://en.wikipedia.org/wiki/Quiz_show) exhibition match, [IBM](https://en.wikipedia.org/wiki/IBM)'s [question answering system](https://en.wikipedia.org/wiki/Question_answering_system), [Watson](https://en.wikipedia.org/wiki/Watson_(artificial_intelligence_software)), defeated the two greatest *Jeopardy!* champions, [Brad Rutter](https://en.wikipedia.org/wiki/Brad_Rutter) and [Ken Jennings](https://en.wikipedia.org/wiki/Ken_Jennings), by a significant margin.[[151]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-FOOTNOTEMarkoff2011-166) In March 2016, [AlphaGo](https://en.wikipedia.org/wiki/AlphaGo) won 4 out of 5 games of [Go](https://en.wikipedia.org/wiki/Go_(game)) in a match with Go champion [Lee Sedol](https://en.wikipedia.org/wiki/Lee_Sedol), becoming the first [computer Go](https://en.wikipedia.org/wiki/Computer_Go)-playing system to beat a professional Go player without [handicaps](https://en.wikipedia.org/wiki/Go_handicaps).[[152]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-167) Other programs handle [imperfect-information](https://en.wikipedia.org/wiki/Imperfect_information) games; such as for [poker](https://en.wikipedia.org/wiki/Poker) at a superhuman level, [Pluribus](https://en.wikipedia.org/wiki/Pluribus_(poker_bot))[[p]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-169) and [Cepheus](https://en.wikipedia.org/wiki/Cepheus_(poker_bot)).[[154]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-FOOTNOTEBowlingBurchJohansonTammelin2015-170) [DeepMind](https://en.wikipedia.org/wiki/DeepMind) in the 2010s developed a "generalized artificial intelligence" that could learn many diverse [Atari](https://en.wikipedia.org/wiki/Atari_2600) games on its own.[[155]](https://en.wikipedia.org/wiki/Artificial_intelligence#cite_note-FOOTNOTESample2017-171)

5.

1. **The AI is programmed to do something devastating:** Autonomous weapons are artificial intelligence systems that are programmed to kill. In the hands of the wrong person, these weapons could easily cause mass casualties. Moreover, an AI arms race could lead to an AI war that also results in mass casualties. To avoid being thwarted by the enemy, these weapons would be designed to be extremely difficult to simply “turn off,” so humans could plausibly lose control of such a situation. This risk is one that’s present even with narrow AI, but grows as levels of AI intelligence and autonomy increase.
2. **The AI is programmed to do something beneficial, but it develops a destructive method for achieving its goal:** This can happen whenever we fail to fully align the AI’s goals with ours, which is difficult. If you ask an intelligent car to take you to the airport as fast as possible, it might get you there chased by helicopters and covered in vomit, doing not what you wanted but literally what you asked for. If a superintelligent system is tasked with a ambitious geoengineering project, it might wreak havoc with our ecosystem as a side effect, and view human attempts to stop it as a threat to be met.