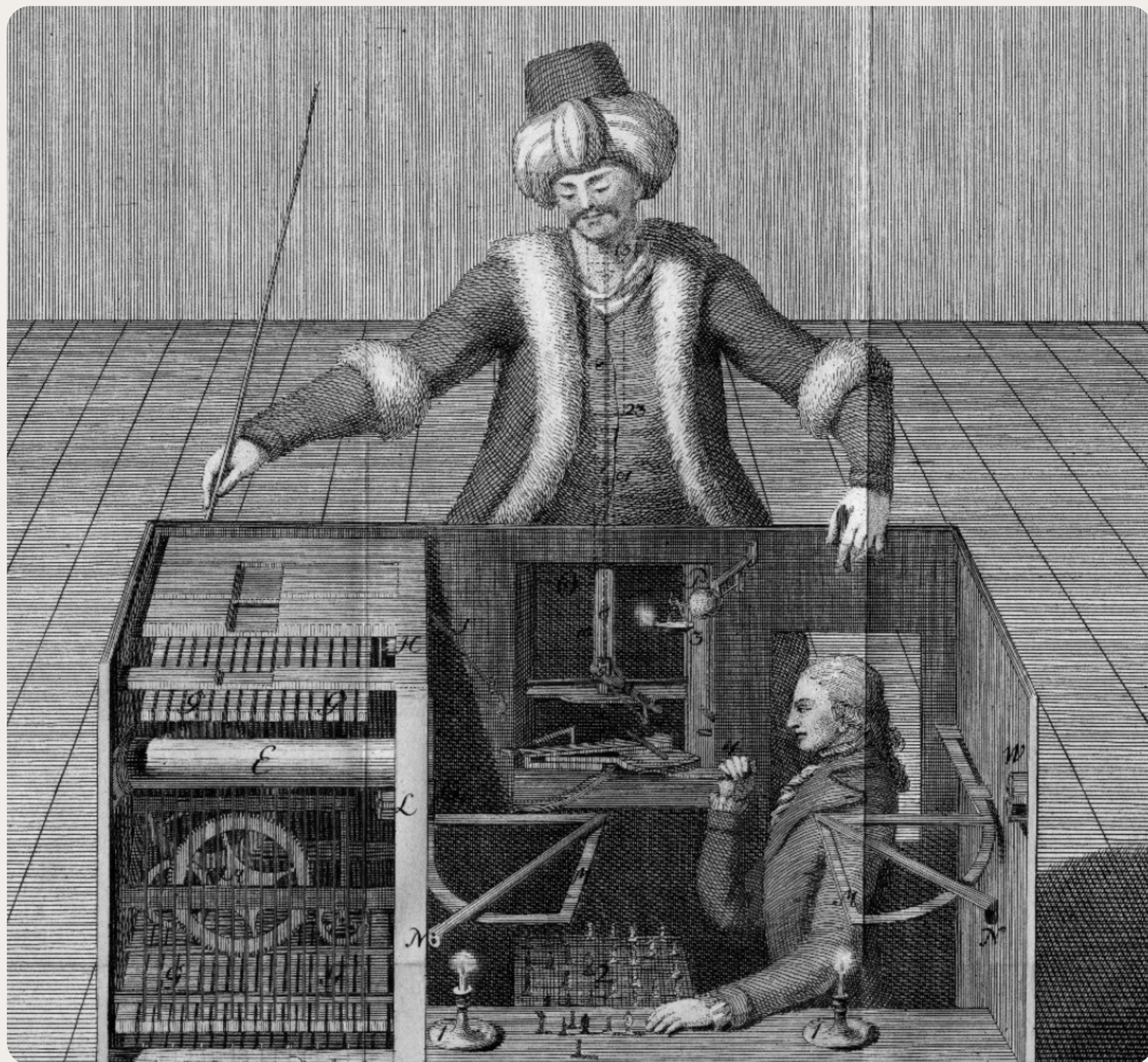


The History of Humans and Machines

Through the Middle Ages, alchemists in Europe and the Middle East sought, in addition to transmuting base metals into gold, *to create life in the lab*. That early fascination with artificial life has endured.





1700s

In the Age of Enlightenment, the “Mechanical Turk”—secretly powered by actual chess masters—dazzled countless opponents (Benjamin Franklin and Napoleon Bonaparte among them) with its seeming ability to compete autonomously at a high level.

Many observers were skeptical that the Mechanical Turk could actually think for itself, but its owners exhibited it on tours across Europe and North America for more than 80 years, suggesting **the perennially captivating effects such technology could have on audiences.**

1920s–1950s

The word *robot* entered the English language in the 1920s, well after notions of “mechanical men” and “automatons” had already taken hold.

Fritz Lang’s *Metropolis*, with its depiction of the “Machine Man,” debuted in 1927. The floodgates were open; by the mid-20th century, AI and other related technologies were hallmarks of science fiction, whether in comics, literature, movies, or television.

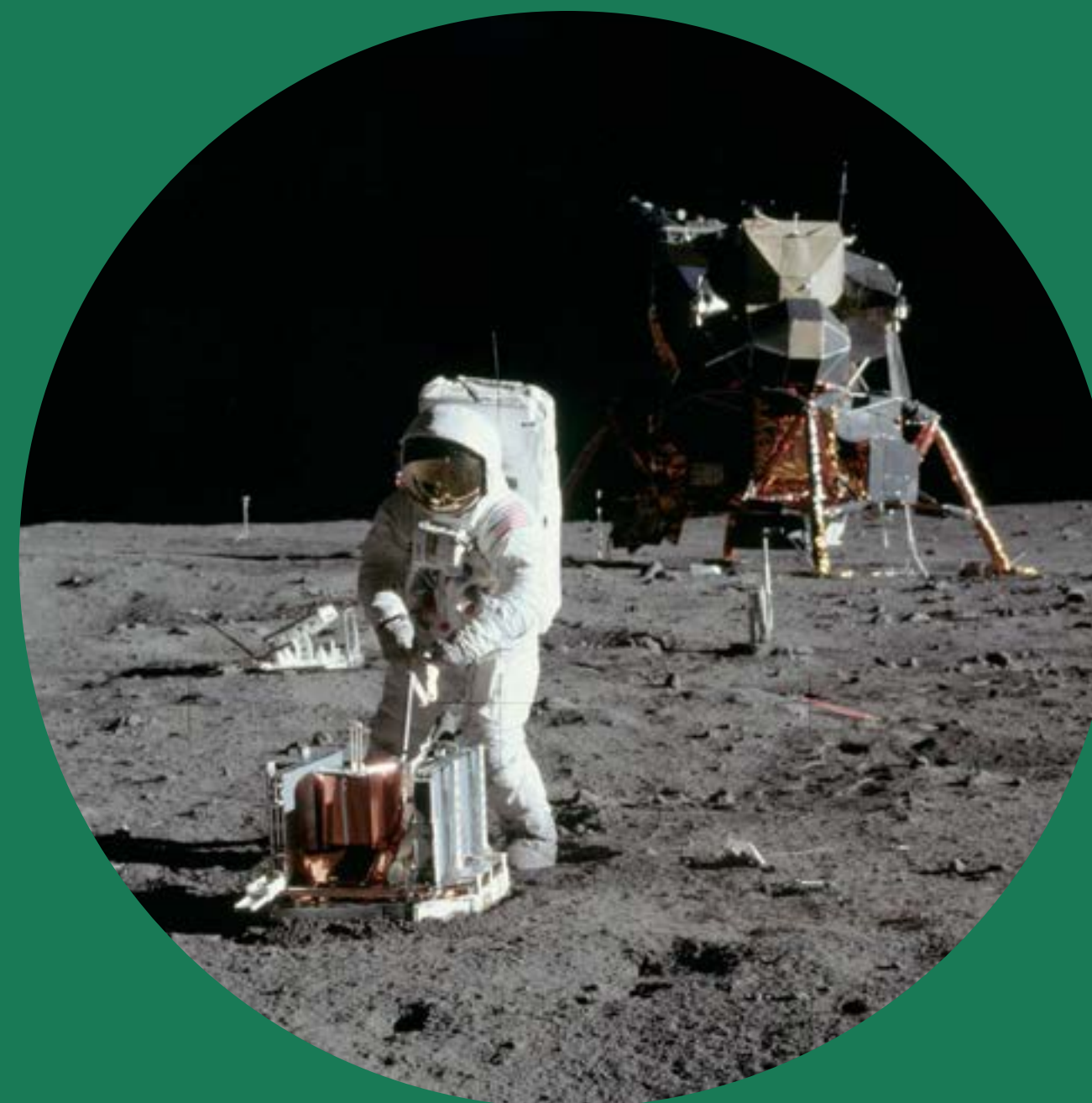


1960s

Indeed, AI had become a mainstay of postwar consumer culture. In 1962, the premiere episode of the cartoon TV series *The Jetsons*, titled “Rosey the Robot,” focused on the space-age family’s comedic troubles with a lower-budget automatic maid. The premise tapped into a broader sentiment that remains to this day: AI might create as many problems as it solves.

Amid a decade of moonshot optimism, film and television soon began exploring the darker side of artificial intelligence.

Just six years after *The Jetsons* first premiered, *2001: A Space Odyssey* took a much bleaker approach to intelligent machines. The film’s villainous HAL 9000 remains a popular metonym for AI’s potential to do harm. Episodes of *Star Trek* explored similar themes.





Offscreen, small but important steps were being taken toward real-world AI. At the dawn of the 1960s, **John F. Kennedy's presidential campaign contracted with a company called Simulmatics to use a "people machine" to survey citizens and predict their behavior.** This was the first instance in which a presidential campaign relied on algorithmic modeling to generate campaign advice, but it certainly wouldn't be the last.

And in 1966, a computer science researcher at MIT designed ELIZA, an early prototype of a natural language processing system. Considered the world's first chatbot, ELIZA could only communicate on a superficial level; still, it passed a limited version of the Turing test.

1970s–1990s

Scientists around the world continued to make significant progress in the years that followed. **Major universities established dedicated AI labs**, where researchers developed increasingly efficient algorithms and natural language processing systems. In 1973, engineers at Japan's Waseda University unveiled WABOT-1, a humanoid robot that could walk, talk, and grip objects.

Nevertheless, AI has hardly followed an unbroken trajectory of growth and increased adoption. So-called AI winters emerged at various points during the 1970s, 1980s, and early 1990s, marked by waning public interest and meager private investment. Many observers felt that the technology hadn't lived up to its promise.



1990s–2010s

AI returned to the fore with the defeat of Garry Kasparov—one of history’s greatest chess players—by IBM’s Deep Blue supercomputer in a tournament held in 1997. Although scientists (and chess experts) debated the significance of the outcome, it was hard to ignore the looming question: “Had artificial intelligence eclipsed human intelligence?”

The technology grew even more sophisticated over the next two decades. In 2016, Lee Sedol, one of the highest-rated Go players of all time, lost to Google DeepMind’s AlphaGo program in a game that, because of its complexity, was previously deemed unwinnable by AI. Since Sedol’s defeat, **AI has continued to take the edge in a number of complex games and competitive e-sports, like Dota 2.**





2020s

While AlphaGo was conquering one of the world's oldest board games, DeepMind's AlphaFold team was using AI to study the very building blocks of life. In 2020, AlphaFold's deep learning system solved the "protein-folding problem" that had befuddled scientists for half a century; by 2022, it had predicted the structure of more than 200 million proteins, **yielding an extraordinary resource for biological research and drug discovery.**

Meanwhile, 2022 saw the debut of apps like DALL-E 2, Midjourney, and Stable Diffusion, which allow users to generate images of astonishing quality and variety by means of a simple text suggestion. Millions signed on to experiment with creating artwork on command.





OpenAI's subsequent introduction of ChatGPT created an even greater tempest, sparking an outpouring of excitement over the possibilities of generative AI—as well as debate about its limitations and its ethical and legal implications.

Until now machines have never been able to exhibit behavior indistinguishable from humans. But **new generative AI models are not only capable of carrying on sophisticated conversations with users; they also generate seemingly original content.**