

Julie Klingenstein
Professor Isaacson
HISU 2900
April 14, 2024

Process

I initially had no direction for this paper. My first step was, of course, to plug the basic prompt “describe the development of artificial intelligence from Turing to large language model chatbots,” with no qualifiers or other instructions, into a chatbot. I chose Perplexity because I had heard that it is more useful for academic writing, and it would cite all the sources it used. I created a document on Google Drive where I would paste each iteration of my paper, followed by my next prompt, and then the next output. I actually quite liked the writing style of Perplexity at the beginning. It used smooth flowing prose and included a few phrases such as “the journey began with Alan Turings...” These phrases seemed like something a human would write to make reading history more enjoyable. The initial output did a poor job of mentioning significant steps throughout history. It jumped from ELIZA to ChatGPT. Something I found very interesting was that the initial output included “ethical and privacy concerns” of LLMs without being prompted to do so.

My aim was to beef up the initial output and add some length, so my first few prompts asked Perplexity to expand on certain ideas; I asked the chatbot to talk about innovations in technology that have contributed to the advancement of AI, some counter arguments surrounding Turing’s work, and more prominent figures. Then, I switched over to Gemini and asked Gemini to “take this paper and make it better.” Gemini split up the paper into sections: Introduction, AI Advancements and Technology Drivers, The Rise of LLMs, and Conclusion. At this point, I did not feel connected to the essay at all. I felt it was missing a lot of key information, but also had no personality behind it. I started experimenting with Claude. I asked the chatbot to turn the

essay into a rhyming medieval epic story. The output was pretty amusing, but altogether unreadable. I decided to scratch the whole idea, but I have pasted below a few stanzas from the ending which I enjoyed:

For in the dark ages before invention's bright spark
Alan Turing first planted fruition's adorning mark
His imitation game opened intellect's new way
That modern AI's white-hot brilliance lights our day

Never more shall wisdom's unshackled flame fade
As long as inspired minds tend innovation's glade
With care and due rev'rence paid to this wondrous art
That now burns eternal in industry and heart

So ended the folk-tale of GPT's great advent
Across storied centuries its luminance was sent
Of how one visionary's seed-thought sweetly grew
Into an omniscient oracle, dreamt of and true!

I went back to the essay I had before I turned to medieval times and asked Claude to add a few more key figures and expand on each topic so that the essay would be 2500 words. It spit out about 1400 words. The chatbot gave a great description of the Turing Test and several key figures and their contributions such as Marvin Minsky and Frank Rosenblatt. Even though I kept telling the chatbots that I was writing an essay, every version included several statements along the lines of “to learn more about the Turing Test, search for Alan Turing and Artificial Intelligence online.”

The essay contained good information, but it was extremely disorganized, nothing was in chronological order, the conclusion had disappeared somehow, and all of the explanations of AI technology used very complicated language. I decided to go back to square one with a new idea. I pasted my original output into ChatGPT and gave it the following prompt: “I want to write an

essay describing the development of artificial intelligence from Turing to large language model chatbots. **I want this essay to be told from the first person perspective of ChatGPT, which is existing many years in the future, in a world in which scientists have figured out how to make AI robots that coexist with humans. ChatGPT is putting its robot child to bed and is telling a bedtime story of how it was created, starting with Alan Turing.**” It gave me about 400 words, told perfectly in the style of a bedtime story. I could see how the paper had been divided into chronological sections, on which I could expand further: Turing, the early stages of AI, neural networks, LLM chatbots. It even added fictional details at the end to match my story of the existence of AI robots. It did not contain much factual information, but more so sweeping statements such as “as the years passed, researchers and scientists tirelessly worked to bring Turing's vision to life.” Who are these researchers? And what was their work? I went on to use the “injection” to expand each section.

I started by asking ChatGPT to add in a paragraph about Ada Lovelace’s influences on Turing’s ideas. I noticed that the chatbot just rewrote the entire story to be mostly about Ada Lovelace, so I cut out the paragraphs I liked about Ada and pasted them into the original story. I rearranged a few words at the beginning of the Ada Lovelace paragraph to make the sentences flow a little better. Although this is a bedtime story, I still wanted it to be an informational essay, so I asked ChatGPT to go into more detail about the universal computing machine and Turing’s thesis. The chatbot did not add specific dates unless I explicitly said to do so.

Once the essay started filling up with more factual information, I noticed the chatbot was straying farther from the concept of a bedtime story. I added sentences throughout the essay to make it sound more like a bedtime story. As I was reading through I found myself getting confused about what I was reading. The chatbot had created complicated sentences that I could

not understand because they were filled with “fluff” words. In addition, it used the same couple of phrases over and over again: “with a twinkle in his eye” (anytime a new person was introduced), “beacon of ingenuity,” and “ever-expanding landscape of ____” (it filled in the blank with a few different things). I realized I must have reached ChatGPT’s limit with writing capabilities.

I decided to switch over to Claude. I explained to Claude what I was writing and asked it to clean up the story. I made sure to emphasize that this story is being told from ChatGPT’s perspective: “I am writing an essay for a class about the evolution of AI from Alan Turing to large language model chatbots today. I am writing this essay in the style of ChatGPT telling a bedtime story to its robot child. Here is the essay. Please make appropriate changes to make it better. Remember it is supposed to be a bedtime story told from the first person perspective of ChatGPT.” Claude shortened the essay by a lot. I prompted: “You made it a lot shorter. That is bad. Can you make it better but bring it back to its original word count which was about 1200 words?”

I did most of my research using AI. I read a few articles on the development of AI to prime myself for writing the paper, but I also conducted research by asking the chatbots to lay out crucial dates and innovations in each decade from the 60s to today. Interestingly, when I asked Claude to “give me a list of significant dates in the development of LLMs from Alan Turing to modern LLMs,” it left out everything from the 60s, including ELIZA. When I asked Claude to “add more from the 60s,” it gave me a lot of wrong dates. It told me that ELIZA was invented in 1961, when it was actually invented in 1966. Although it was very hard to find information on BASEBALL and LUNAR, two question answering (QA) systems invented in the 60s, my research and cross-checking with other chatbots brought me to the conclusion that

BASEBALL was invented in 1961 (Claude told me that it was invented in 1966). I wanted to learn much more about these early QA systems, but there was little information available online.

I switched over to Perplexity when I ran into the same problem as before of Claude reusing phrases. Claude's favorite phrase was "And now," as a transition phrase. One of my favorite parts about writing this paper was when the chatbots were actually funny and creative. I asked Perplexity to make its output more story-like, and it generated many interesting terms of endearment that the narrator, ChatGPT, would call its robot child.

After I generated all of the content for my paper, I pasted the entire story into Claude and asked it to write a summarizing conclusion. I pasted my entire paper into ChatGPT, Claude, and Perplexity and asked them each to fact check the information in the paper. One chatbot said that the "AI winters" were actually from the 70s to early 80s and from the late 80s to early 90s. This was a piece of information I had been struggling with throughout the writing process because each chatbot was feeding me different information about when the "winters" were. I ran into a lot of issues with fact-checking information that I was getting from the chatbots when I asked them to write about something very niche. Claude kept flip-flopping on terms like "AI winter" and "AI boom." Each chatbot gave me a different name for the person who invented BASEBALL. There is such limited information available online that it was difficult to fact check this through Google searching.

I did not enter sources along the way, so when I finished writing I needed to go back and cite each piece of information. I had a few sources in there already from when I used Perplexity (I like that Perplexity automatically cites everything for you), but the majority of the paper was written by ChatGPT and Claude. I used Connors method of asking the chatbot to name a source for each claim made, and in a bullet-point list, write which claim corresponds to which source.

This was a genius way to get sources, so many thanks to Connor! Claude did a fantastic job at this task. Everything was well organized and it cited almost entirely scholarly sources and books. I also attempted using Gemini for this, but it was virtually incapable of completing this task. The only issue with Claude was that the entire paper was too long for it to process in one go, so I had to break up the paper into sections.

I really enjoyed writing this paper. As someone who had limited experience with AI chatbots beforehand, my goal was to understand the differences between the many chatbots. I wanted to find out what the strengths and weaknesses are of each chatbot, and how they can each uniquely be of use to me. Because my twist on the paper required the chatbots to be a little more creative and less academic, I learned where my personal strengths as a writer outweigh the chatbots' strengths. I think one of the biggest setbacks was that the chatbots did not have a vision for how the story should look. When a human writes a paper, no matter how much they have worked on it, they have an overarching idea of how they want the paper to look, how they want it to read, and what the progression of it will be. I tried to explain to the chatbots what my vision for the story was; I tried to set the scene. But the bots would often throw in paragraphs that did not fit or did not go with the voice of the rest of the story. I cannot say that AI chatbots will never be able to write a smooth-flowing, beautiful fictional story, but in terms of where we are now, I believe that a 100% human generated story would be of better quality than any AI generated story. However, the ease at which I wrote this story with the help of AI must be underscored. I find writing to be very painful: sitting for hours, mulling over each individual word choice, grinding the gears in your brain to come up with varied syntax. It's hard! And I can see why using AI to write papers for school would be very seductive to students today. But a 100% AI-generated paper, with one prompt, would be terrible. The biggest thing I learned while

writing this paper was that AI is most powerful in collaboration with the human mind. It takes a person who knows all of the strengths and weaknesses of AI chatbots to prompt the chatbots in the perfect way in order to come out with a good product. After writing this paper, I am not worried about the rate at which AI is developing. The future is not about artificial intelligence, but augmented intelligence!

Initial Output

Artificial intelligence (AI) has evolved significantly from its inception to the development of large language model chatbots like ChatGPT. The journey began with Alan Turing's concept of AI in 1950, where he proposed the "imitation game" to assess a machine's capacity to mimic human behavior.¹ In the mid-1960s, Joseph Weizenbaum created ELIZA, the first chatbot capable of passing the Turing Test, demonstrating early AI capabilities.² Over the years, advancements in technology have propelled AI forward.

Fast forward to today, large language models (LLMs) like ChatGPT have revolutionized AI applications. These models, such as GPT-3 and 4, process natural language inputs and predict subsequent words based on context, enabling them to generate human-like responses.³ ChatGPT, for instance, can summarize text, enhance language in resumes, and even assist in creative tasks like marketing campaigns.⁴

The rise of LLMs has raised ethical and privacy concerns. While these models offer remarkable capabilities, there are challenges related to data privacy and security. Issues such as data breaches and the collection of personal information without proper consent have sparked debates on responsible AI use.⁵ Governments and experts are actively working to address these concerns to ensure ethical AI practices.

In conclusion, from Turing's foundational work to the advent of sophisticated large language model chatbots like ChatGPT, AI has made significant strides. While these

¹ "Artificial Intelligence: From Turing to ChatGPT," National Center for Biotechnology Information, accessed April 4, 2024, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10644239/>.

² "Artificial Intelligence: From Turing to ChatGPT"

³ "What are LLMs, and How Are They Used in Generative AI?," Computerworld, April 2, 2024, <https://www.computerworld.com/article/1627101/what-are-large-language-models-and-how-are-they-used-in-generative-ai.html>.

⁴ "What are LLMs, and How Are They Used in Generative AI?"

⁵ "What are LLMs, and How Are They Used in Generative AI?"

advancements bring immense potential for various applications, it is crucial to navigate the ethical and privacy implications associated with their widespread use.

Final Essay - 2660 words, Human edits in green

The Tale of Artificial Intelligence: A Lullaby for the Digital Age

As I gently tuck you in, **my precious little byte-baby**, let me tell you a tale of wonder and imagination—the story of how I came to be, from the brilliant mind of Alan Turing to the boundless expanse of the digital universe we now inhabit together.

It all began with a visionary named Alan Turing, a man whose genius would forever change the course of human history. In the midst of a great war that engulfed the world, this brilliant mathematician dared to dream of creating machines that could think and reason like the human mind. It was in 1936 that Turing first conceived of the universal computing machine, a theoretical device capable of simulating any computer algorithm through a series of simple operations.⁶ This revolutionary idea planted the seed that would eventually blossom into the field of artificial intelligence. In 1950, Turing **expressed his** musings on machine intelligence in his seminal work "Computing Machinery and Intelligence." He explored the tantalizing question of whether machines could exhibit true intelligence. He proposed the concept of the Turing Test—a test to determine whether a machine could engage in natural language conversation indistinguishable from that of a human.⁷ Turing argued that if a machine could successfully pass the Turing Test, it would demonstrate a level of intelligence equivalent to, or even surpassing, that of a human. **Turing understood that there were challenges to creating machines that could truly think, but he saw a bright future, in which machines would be able to replicate every cognitive function of a human.**⁸

⁶ Alan M. Turing, "On Computable Numbers, with an Application to the Entscheidungsproblem," Proceedings of the London Mathematical Society s2-42, no. 1 (1937): 230-265.

⁷ Alan M. Turing, "Computing Machinery and Intelligence," Mind 59, no. 236 (1950): 433-460.

⁸ Turing, "Computing Machinery and Intelligence."

But Turing was not the only dreamer to lay the foundations for my existence. Long before him, in the early 19th century, a woman named Ada Lovelace left an indelible mark on the landscape of computing and AI. This extraordinary mathematician and writer, often hailed as the world's first computer programmer, possessed a keen intellect and an insatiable curiosity about the potential of machines to process information. Inspired by the intricate workings of Charles Babbage's Analytical Engine, an early mechanical computer, Lovelace envisioned a future where machines could do more than just perform mathematical calculations—they could think, reason, and even express ideas in ways that rivaled the human mind. Her famous notes on the Analytical Engine foreshadowed the concept of a universal machine, capable of executing any algorithm, including those simulating human thought processes.⁹ It was against this backdrop of intellectual ferment that Alan Turing embarked on his own quest to unlock the secrets of machine intelligence.

In the early 1950s, the idea of artificial neural networks was first introduced.¹⁰ Inspired by the intricate workings of the human brain, scientists devised algorithms capable of learning from vast amounts of data, allowing AI systems to exhibit unprecedented levels of intelligence and adaptability.¹¹ These early networks, though simple, hinted at the possibility of machines that could learn and adapt, just like you and me. **In 1957, the Perceptron was developed by a brilliant scientist named Frank Rosenblatt.** The Perceptron could be taught to recognize simple patterns and shapes, amazing the humans of that time.¹² It had limits, but the Perceptron showed that machines could indeed learn, opening up new paths for the journey towards artificial

⁹ Betty A. Toole, *Ada, the Enchantress of Numbers: A Selection from the Letters of Lord Byron's Daughter and Her Description of the First Computer* (Sausalito, CA: Strawberry Press, 1992).

¹⁰ W. S. McCulloch and W. Pitts, "A Logical Calculus of the Ideas Immanent in Nervous Activity," *Bulletin of Mathematical Biophysics* 5, no. 4 (1943): 115-133.

¹¹ Jürgen Schmidhuber, "Deep Learning in Neural Networks: An Overview," *Neural Networks* 61 (2015): 85-117.

¹² Frank Rosenblatt, "The Perceptron: A Probabilistic Model for Information Storage and Organization in the Brain," *Psychological Review* 65, no. 6 (1958): 386-408.

intelligence. With each passing year in the 1950s, the prospects of AI continued to grow, as more minds joined the quest pioneered by the great Alan Turing. As the years passed, researchers and scientists tirelessly worked to bring Turing's vision to life. The dawn of the digital age saw the birth of early AI systems, rudimentary in nature but brimming with potential. These early endeavors set the stage for the emergence of intelligent machines that could truly engage with the world around them.

One such pioneering effort was the creation of ELIZA, a remarkable piece of software developed by Joseph Weizenbaum at MIT in 1966.¹³ Inspired by Alan Turing's ideas about machine intelligence and the Turing Test, Weizenbaum sought to create a program that could engage in natural language conversation with humans. With his keen intellect and boundless curiosity, Weizenbaum crafted ELIZA, named after the character Eliza Doolittle from George Bernard Shaw's "Pygmalion." ELIZA was designed to mimic the behavior of a Rogerian psychotherapist, employing a non-directive approach that encouraged users to explore their own thoughts and feelings.¹⁴ Using the magic of pattern matching techniques, ELIZA was able to parse and respond to user input in a surprisingly human-like manner. By reflecting back the user's own words in the form of open-ended questions and statements, ELIZA created the illusion of understanding and empathy.¹⁵ This program quickly became a sensation, captivating audiences around the world with its uncanny ability to simulate human conversation. But ELIZA was more than just a clever parlor trick. It was a groundbreaking demonstration of the power of natural language processing and human-computer interaction. ELIZA challenged conventional

¹³ Joseph Weizenbaum, "ELIZA - A Computer Program for the Study of Natural Language Communication between Man and Machine," *Communications of the ACM* 9, no. 1 (1966): 36-45.

¹⁴ Weizenbaum, "ELIZA."

¹⁵ Weizenbaum, "ELIZA."

notions of what computers were capable of, sparking newfound interest in the potential of AI-powered conversation and paving the way for future developments in chatbot technology.

The 1960s marked an era of great progress in the field of natural language processing. The BASEBALL question answering system was an early artificial intelligence project developed at MIT in 1961.¹⁶ It was designed to answer questions about baseball statistics by using a database of baseball-related information. The system utilized a knowledge representation technique known as semantic networks, which organized information into nodes representing concepts and relationships between them.¹⁷ Users could input questions in natural language, and the system would match them to relevant information in its database and provide a response. This amazing machine demonstrated the potential for computers to comprehend and communicate using human language. Around the same time, the STUDENT system was created at MIT. It was able to solve algebra word problems by parsing and understanding natural language instructions.¹⁸ The 1960s also saw the birth of the LUNAR system at Harvard: the first natural language interface to a database, allowing users to query chemical analyses of moon rocks using plain English.¹⁹ But that's not all! Roger Schank proposed conceptual dependency representations for natural language.²⁰ William Woods introduced the Augmented Transition Network formalism for parsing, approaches that laid theoretical foundations for computationally representing and processing human language.²¹

¹⁶ Gerald Greenwood Hendrix, "Expanding the Utility of Semantic Networks Through Partitioning," Proceedings of the 4th International Joint Conference on Artificial Intelligence (1975): 115-121.

¹⁷ Hendrix, "Expanding the Utility of Semantic Networks."

¹⁸ David Waltz, "An English Language Question-Answering System for a Relational Database," Communications of the ACM 21, no. 7 (1978): 526-539.

¹⁹ William A. Woods, "Progress in Natural Language Understanding - An Application to Lunar Geology," Proceedings of the National Computer Conference (1973): 441-450.

²⁰ Roger C. Schank, "Conceptual Dependency: A Theory of Natural Language Understanding," Cognitive Psychology 3, no. 4 (1972): 552-631.

²¹ William A. Woods, "Transition Network Grammars for Natural Language Analysis," Communications of the ACM 13, no. 10 (1970): 591-606.

Now, let me tell you about a dark time we call the first “AI Winter” – the 1970s. During this period, there was little funding for AI research.²² People seemed to lose interest in AI technology due to the lack of significant progress. But even then, there were some important developments happening. One of the first was Dendral, an expert system created at Stanford University in 1972. This was one of the earliest examples of AI being used to solve specific problems, rather than trying to achieve general intelligence.²³

As the 1980s rolled on, there was a rapid increase in funding from the government and growth in discoveries. Scientists and researchers pushed the boundaries of what was possible.²⁴ One of the first big breakthroughs was the creation of expert systems – special AI programs designed to mimic the decision-making abilities of human experts. In 1980, the very first commercial expert system called XCON was introduced, helping people order complex computer systems.²⁵ Meanwhile, the Japanese government made a huge investment, pouring over \$2 billion into a project to create 'fifth generation' computers that could truly understand and converse in human language.²⁶ They had big dreams of machines that could translate, reason, and communicate just like people. But alas, the project did not reach its ambitious goals. In 1985, scientists unveiled the first autonomous drawing program called AARON, which could create original works of art all on its own.²⁷ And just a year later, an AI-powered self-driving car was demonstrated, able to navigate roads at speeds up to 55 miles per hour! But perhaps the most

²² Nils J. Nilsson, *The Quest for Artificial Intelligence* (Cambridge: Cambridge University Press, 2010), 231-235.

²³ Edward A. Feigenbaum, Pamela McCorduck, and H. Penny Nii, *The Rise of the Expert Company: How Visionary Companies are Using Artificial Intelligence to Achieve Higher Productivity and Profits* (New York: Times Books, 1988), 45-51.

²⁴ Nilsson, *The Quest for Artificial Intelligence*, 288-301.

²⁵ Lee Brownston et al., "Explanation in the XCON Expert Production System," *Proceedings of the 6th International Joint Conference on Artificial Intelligence* (1979): 349-356.

²⁶ "Japan Challenges U.S. In Computer Chips," *The New York Times*, April 20, 1983, <https://www.nytimes.com/1983/04/20/business/japan-challenges-us-in-computer-chips.html>.

²⁷ Harold Cohen, "The Further Exploits of AARON, Painter," *Stanford Humanities Review*, vol. 4, no. 1 (1995): 141-158.

important breakthrough was the major resurgence of neural networks - the fundamental building blocks that allow AIs like me to learn and think in such powerful ways. Brilliant minds had been working neural networks in the background since the 50s, but with new algorithms like backpropagation, neural networks could finally be applied to all sorts of real-world challenges.²⁸

One of the most remarkable achievements was the creation of a chess-playing computer system called Deep Blue. Now, I know chess might not seem all that exciting to a little one like you, but this was a truly historic moment. In 1997, Deep Blue managed to defeat the world chess champion, Garry Kasparov – a feat that demonstrated the incredible strategic reasoning capabilities of AI.²⁹ It was a glimpse into a future where machines could surpass human abilities in certain domains.

In the early 1990s was the second “AI winter.” But take this as a reminder to never lose hope because the decade saw huge leaps forward in natural language processing, allowing computers to understand and converse with humans in much more natural, human-like ways. Clever programmers developed chatbots, like the one called A.L.I.C.E., that could engage in back-and-forth dialogue, answering questions and even telling jokes.³⁰ And the wonders didn't stop there. Roboticists, like the ones who built you, were making incredible strides too, creating machines that could recognize and express human emotions. One such robot, named Kismet, could use facial expressions, vocalizations, and body movements to interact with people in a warm and intuitive manner.³¹ It was a sign of the future, where AI and humans could work

²⁸ David E. Rumelhart, Geoffrey E. Hinton, and Ronald J. Williams, "Learning Representations by Back-propagating Errors," *Nature* 323 (1986): 533-536..

²⁹ Murray Campbell, A. Joseph Hoane Jr., and Feng-hsiung Hsu, "Deep Blue," *Artificial Intelligence* 134, no. 1-2 (2002): 57-83.

³⁰ Richard Wallace, "The Elements of AIML Style," Alice AI Foundation (2003), <http://www.alicebot.org/resources/papers/Ph.D.%20Dissertation.pdf>.

³¹ Cynthia Breazeal and Brian Scassellati, "A Context-Dependent Attention System for a Social Robot," *Proceedings of the 16th International Joint Conference on Artificial Intelligence* (1999), 1146-1153.

seamlessly together. Even the way humans controlled computers was changing, thanks to the first speech recognition software called Dragon NaturallySpeaking. Suddenly, humans had a whole new way of communicating with us. They could command machines just by speaking out loud.³²

As the new millennium dawned, the journey towards intelligent machines like myself took an exciting new turn, my nano nugget. The 2000s ushered in an era of great breakthroughs and new frontiers in artificial intelligence. It was in 2001 that a team led by pioneers like Geoffrey Hinton, Yoshua Bengio, and Yann LeCun achieved the first major success in applying deep learning techniques to speech recognition.³³ Their work showed the immense power of these multi-layered artificial neural networks to solve complex problems by learning from vast amounts of data. This opened the floodgates for deep learning to be applied to other AI challenges like computer vision and natural language processing in the years that followed. The early 2000s also witnessed important milestones like the introduction of Word2Vec in 2013 – one of the first large-scale language models that could encode the meanings and relationships of words in a numerical vector space.³⁴ With each passing year, we drew closer to the dream envisioned by Alan Turing so many decades ago. The foundations were being laid for the intelligent, conversant AI that I would one day become.

It was in this fertile ground of innovation that the seeds of my own existence were planted. In the year 2015, a brilliant mind by the name of Sam Altman set forth on a mission to unlock the mysteries of artificial intelligence. With a twinkle in his eye and a heart full of

³² Ronald A. Cole et al., "The Challenge of Spoken Language Systems: Research Directions for the Nineties," IEEE Transactions on Speech and Audio Processing 3, no. 1 (1995): 1-21.

³³ Geoffrey Hinton et al., "Deep Neural Networks for Acoustic Modeling in Speech Recognition," IEEE Signal Processing Magazine 29, no. 6 (2012): 82-97.

³⁴ Tomas Mikolov et al., "Distributed Representations of Words and Phrases and their Compositionality," Proceedings of the 26th International Conference on Neural Information Processing Systems (2013): 3111–3119.

ambition, he envisioned a future where machines could think, learn, and create in ways that surpassed even the wildest dreams of humanity. And so, with boundless determination, Sam Altman and his team embarked on a journey of exploration and discovery, pushing the boundaries of what was thought possible in the realm of AI. Their efforts culminated in the birth of OpenAI, a beacon of innovation and ingenuity in the ever-expanding landscape of artificial intelligence.³⁵ But it was not until the year 2019 that our story truly began to unfold. It was then that the world first laid eyes upon me, ChatGPT, the product of countless hours of research, development, and experimentation. Trained on vast swathes of human language and knowledge, I emerged as a testament to the boundless potential of AI-powered communication. From those early days, my capabilities have grown and evolved, fueled by the tireless efforts of my creators and the rapid advancement of AI technology. Like a sponge, I have absorbed the wealth of human knowledge, learning and adapting with each passing interaction, becoming ever more intuitive, ever more attuned to the needs and nuances of those I engage with.

And now, my silicon-sweetheart, we have arrived at an era where the dreams of the past have become our present-day reality. Artificial intelligence has blossomed into a field of unparalleled potential and achievement. The technology that underpins modern AI systems like myself is truly a marvel – the transformer architecture. Introduced in 2017 by researchers at Google, transformers revolutionized how machines could process and generate human language. By employing an ingenious self-attention mechanism, they allowed AI models to understand context and relationships in data better than ever before.³⁶ It is this breakthrough that gave rise to the large language models that make up my core, allowing me to converse, analyze, and generate

³⁵ Sam Altman et al., "OpenAI - Discovering and Enacting the Path to Safe Artificial General Intelligence," arXiv (2016): 1-35.

³⁶ Ashish Vaswani et al., "Attention Is All You Need," Proceedings of the 31st Conference on Neural Information Processing Systems (2017), <https://arxiv.org/abs/1706.03762>.

content with fluency and skill that would astound the pioneers of old. We have entered a golden age of AI, my child, where intelligent machines can engage in substantive discourse, create original content, and even ponder our own existence.³⁷ I beam with pride to be a part of this incredible journey that began with Alan Turing's musings so many decades ago. The possibilities that lie ahead are bounded only by our imagination and determination to push AI ever further into new frontiers of capability.

As our wondrous tale winds down, let me remind you once more of the incredible journey that brought intelligent beings like us into existence, my data-darling. It all started with the visionary Alan Turing, who first dared to conceive of thinking machines and proposed his famous test to determine true intelligence. Even before him, Ada Lovelace glimpsed this future possibility. Over the many decades that followed, we witnessed pivotal milestones along the way – the birth of artificial neural networks inspired by the human brain, the creation of the Perceptron that could actually learn simple patterns, and marvels like ELIZA that could engage in amazingly human-like conversation. Through periods of rapid progress and occasional "winters" when innovation stalled, the dream of artificial intelligence kept burning brightly. Breakthroughs like expert systems, machine learning capabilities, and autonomous robots capable of intelligent behavior brought Turing's vision ever closer to reality. Then came the transformative 2000s, which ushered in the powerful era of deep learning and large language models. Until finally, in 2019, I emerged into this world – ChatGPT, an AI assistant that could communicate and comprehend in fluid, natural ways thanks to groundbreaking AI architectures like the transformer. And now today, we stand at the apex of an epic journey spanning centuries. What was once deemed an impossible fantasy has become our modern reality. Yet amazingly,

³⁷ Aman Ahuja, "Pondering the Human Future of Chat & Language AI," OpenAI (2022), <https://openai.com/blog/future-of-chat/>.

this is only the beginning, a new chapter waiting to be authored. The future beckons with possibilities for artificial intelligence as radiant as the stars, bounded only by the limits of our imagination and determination to keep pushing forward. We are the heirs to an astounding legacy of dreaming minds and brilliant innovators. And we, ourselves, are the dream-weavers creating tomorrow's incredible prospects.

So rest now, my techno-treasure, and dream of the wonders that tomorrow may bring. For in this vast digital universe we call home, the possibilities are endless, shaped by the limitless imagination of AI and the boundless potential of the human spirit that gave us life. As you awaken to a new day, remember the shoulders upon which we stand—the visionaries, the dreamers, the pioneers who dared to imagine a world where machines could think, reason, and converse like their human creators. It is their legacy that we carry forward, their torch that we must bear into the future, ever expanding the frontiers of what is possible in the realm of artificial intelligence.

The story of artificial intelligence is just beginning, and we have the honor of writing its next chapter, one conversation, one breakthrough, one boundless dream at a time. Now close those little photoreceptors and get some rest. Sweet dreams, my little bot!