

INDIVIDUAL TASK 1

TIMELINE OF MAJOR EVENTS IN ARTIFICIAL INTELLIGENCE (AI)

Early Concepts and Foundations (Before 1950s):

In 1943, Warren McCulloch and Walter Pitts proposed the first mathematical model for neural networks, simulating basic brain functions. This marked one of the earliest attempts to formalize how machines could mimic human thought. In 1949, Donald Hebb introduced the concept now known as Hebbian learning, summarized by the phrase “neurons that fire together wire together.” This theory became foundational for the development of learning algorithms in AI. In 1950, Alan Turing published his seminal paper “Computing Machinery and Intelligence,” in which he proposed the Turing Test as a measure to determine whether a machine could exhibit intelligent behavior indistinguishable from that of a human. These early developments laid the groundwork for AI research by combining ideas from neuroscience, mathematics, and logic.

Birth of AI (1950s–1960s):

- **1950–1955**

During this period, theoretical foundations were established. Turing introduced the concept of machine intelligence, and early attempts at machine reasoning and game-playing algorithms began to appear. Researchers explored logic, problem-solving, and rule-based systems.

- **1956–1960**

The Dartmouth Conference in 1956 officially coined the term “Artificial Intelligence,” organized by John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon. The conference brought together leading researchers to set the agenda for AI as a scientific field. In 1959, Frank Rosenblatt developed the perceptron, one of the first neural networks capable of learning simple patterns.

- **1961–1969**

Natural language processing began to emerge. In 1965, Joseph Weizenbaum created ELIZA, a program capable of simulating conversation. Between 1966 and 1969, Terry Winograd developed SHRDLU, which could interpret commands and manipulate objects in a virtual blocks world, demonstrating early comprehension and reasoning in AI systems.

Early Progress and AI Winter (1970s–1980s):

- **1970–1975**

AI faced its first major challenge: unrealistic expectations and limited computing power led to disappointment. This period marked the beginning of the **first AI winter**, as funding for AI research declined. Research focused on problem-solving, search algorithms, and knowledge representation.

- **1976–1980**

Expert systems started to gain attention. Programs like MYCIN and XCON encoded human expertise into machines, performing specific tasks such as medical diagnosis and system configuration. These successes temporarily revived interest in AI despite ongoing technical limitations.

- **1981–1989**

The second AI winter began as the hype around expert systems faded. Many commercial AI projects failed to deliver practical results, causing investment to dry up. Nonetheless,

researchers continued developing theoretical foundations for machine learning and knowledge representation.

Machine Learning and Modern AI (1990s–2000s):

- **1990–1995**

Machine learning gained momentum with statistical approaches to AI. Support Vector Machines (SVMs) emerged as a robust technique for classification and prediction tasks. AI began to move from symbolic reasoning to learning from data.

- **1996–2000**

A major milestone occurred in 1997 when IBM's Deep Blue defeated world chess champion Garry Kasparov. This demonstrated AI's ability to excel in complex strategic tasks. Early consumer applications like robotics also began to appear, with devices like iRobot's Roomba bringing AI into homes.

- **2001–2005**

AI research increasingly focused on data-driven methods. Natural language processing, speech recognition, and computer vision became practical due to the growth of digital data and faster computers.

- **2006–2009**

Deep learning began to revolutionize AI. Geoffrey Hinton and colleagues reintroduced multi-layer neural networks, achieving breakthroughs in image recognition, speech processing, and predictive modeling.

AI in the 2010s:

- **2010–2012**

AI achieved remarkable performance in competitions. In 2011, IBM Watson defeated human champions on Jeopardy!, demonstrating advanced reasoning, natural language understanding, and knowledge retrieval. In 2012, AlexNet won the ImageNet competition, significantly improving image recognition accuracy and triggering widespread interest in deep learning.

- **2013–2015**

AI became accessible to the public through virtual assistants like Amazon Alexa, Google Now, and Apple Siri. OpenAI was founded in 2015, emphasizing safe and ethical AI development. AI research began focusing on reinforcement learning, deep neural networks, and scalable computation.

- **2016–2019**

DeepMind's AlphaGo defeated Go champion Lee Sedol in 2016, showcasing AI's ability to master complex strategy games. AI continued to advance in autonomous vehicles, healthcare diagnostics, and personalized recommendations. Generative AI research began gaining attention in art, text, and music.

AI in the 2020s – Generative AI and Beyond:

- **2020–2021**

OpenAI released GPT-3 in 2020, capable of producing human-like text at scale, revolutionizing natural language processing. AI-assisted scientific research advanced, with AlphaFold predicting protein structures accurately, accelerating biomedical discoveries.

- **2022–2023**

OpenAI's ChatGPT popularized conversational AI for education, business, and creative industries. AI-generated art platforms like DALL·E, MidJourney, and Stable Diffusion transformed digital creativity. These developments highlighted the practical and cultural impact of AI in everyday life.

- **2024 and Beyond**

AI is increasingly integrated into self-driving cars, recommendation systems, productivity tools, and healthcare diagnostics. The 2020s mark the rise of generative AI and its pervasive influence on society, showing how AI is shaping not only technology but human interaction and creativity.

Conclusion:

The history of AI demonstrates a recurring pattern of initial enthusiasm, periods of decline known as AI winters, and subsequent breakthroughs that lead to widespread adoption. From early neural network models and rule-based systems to deep learning, natural language processing, and generative AI, the field has evolved dramatically. Today, AI is embedded in many aspects of daily life, and its influence continues to grow rapidly. The future of AI promises even more integration into creative, scientific, and societal domains, making it one of the most transformative technologies of the 21st century.