Lecture 2

History & Evolution of Human–AI Interaction

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Early Computing and Humans

The relationship between humans and computers began in the mid-20th century.

Early computers were complex machines that needed human operators to feed data and interpret results.

The first computers were used for calculation-heavy tasks (e.g., the ENIAC, UNIVAC).

Interaction was limited to punch cards and printed output.
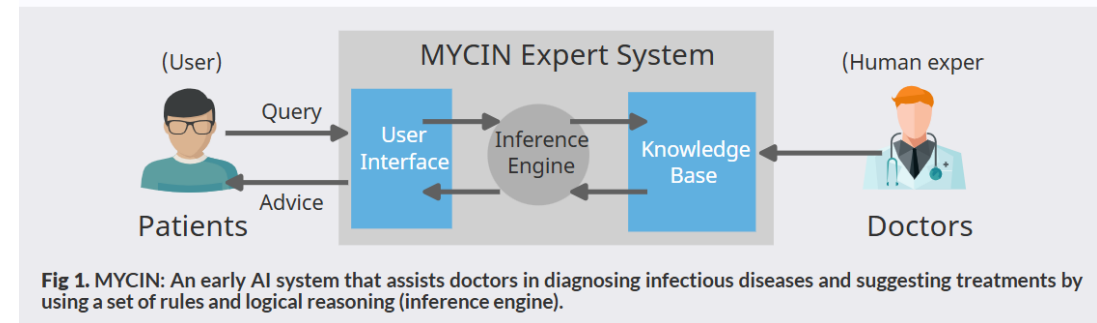
Punch Card in
Punch Card Machine

- [UNIVAC: the first commercial computer that revolutionized data management is 70 years old](#)

Rule-based Systems (Expert Systems)

Emerged in the 1970s-80s, designed to simulate human expert decision-making using predefined rules.

MYCIN, for example, assisted in diagnosing infections.

These systems struggled with flexibility in real-world scenarios.

Fig 1. MYCIN: An early AI system that assists doctors in diagnosing infectious diseases and suggesting treatments by using a set of rules and logical reasoning (inference engine).

Early AI Limitations

- Early AI systems were limited by the computational power of the hardware available at the time. The algorithms used were basic, which hindered their ability to solve complex problems or adapt to new situations.

- In addition, early AI lacked the ability to learn or improve over time, making them static and often ineffective in dynamic environments.

- Many early AI systems failed when applied to real-world scenarios, highlighting their limitations and the need for more advanced approaches.

First Chatbot (ELIZA, 1966)

•ELIZA, created by Joseph Weizenbaum in 1966, was the first significant chatbot. ELIZA simulated conversations by using pattern matching and substitution algorithms. One of its most famous scripts, DOCTOR, was designed to simulate a Rogerian psychotherapist, offering responses based on user input.

•Despite its simplicity, ELIZA provided an early glimpse into the potential for machines to simulate human-like conversation. It was limited by the lack of true understanding or comprehension of context, only responding with pre-programmed patterns.

•ELIZA was a breakthrough in human-computer interaction, laying the foundation for the development of more sophisticated AI-based communication tools.

AI in the 1980s

During the 1980s, AI research expanded significantly, with new developments in machine learning, expert systems. This era saw the development of AI systems that could solve specific problems, like playing chess or diagnosing diseases.
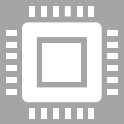
The development of the first neural networks and the increase in computational power led to more advanced AI applications. However, AI was still constrained by the limitations of the hardware and the algorithms of the time.

The decade marked a period of optimism, with researchers believing AI would soon match human intelligence. However, the limits of the technology became evident as AI struggled with more general problem-solving.

Rise of Machine Learning
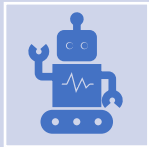
In the late 1990s and 2000s, the focus shifted from rule-based AI to machine learning, a type of AI that allowed computers to learn from data. This era marked the shift from manually programming AI systems to letting machines learn patterns and make predictions based on vast amounts of data.
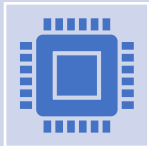
Early machine learning algorithms, such as decision trees and support vector machines, were able to perform specific tasks with a higher degree of accuracy than earlier systems.

Machine learning began to gain traction in fields such as finance, healthcare, and e-commerce, as companies realized the potential of using algorithms to make decisions based on data.

Growth of Internet & AI

The rise of the internet in the late 1990s and 2000s created a huge shift in AI development. The internet provided vast amounts of data, which became the lifeblood for modern AI algorithms.

AI began to be used in a variety of internet applications, including search engines, social media, and online retail . The ability to process large amounts of data allowed AI to improve personalization and recommendation systems.

E-commerce platforms like Amazon started using AI to recommend products based on past behaviors, while social media platforms like Facebook and Twitter began using AI to personalize feeds and ads.

AI in Search Engines

AI algorithms revolutionized search engines by improving the way search results were ranked. Google's PageRank algorithm, which was the first to use AI for ranking web pages based on relevance, became a game-changer in the early 2000s.

AI-driven search engines used algorithms to better understand the intent behind user queries, providing more accurate and personalized results.

Over time, AI in search engines evolved to include voice search and real-time suggestions, further enhancing user experience.

Smartphones & AI Assistants

With the proliferation of smartphones in the late 2000s, AI became more integrated into daily life through virtual assistants like Siri, Google Assistant, and Alexa.

These voice-activated AI assistants used natural language processing (NLP) and machine learning to understand and respond to user queries.

Over time, these assistants became more intelligent, able to handle more complex tasks, such as setting reminders, controlling smart home devices, and providing real-time information.

Deep Learning Era

• The introduction of deep learning, a subset of machine learning that uses multi-layered neural networks, transformed AI.

• Deep learning allows AI to learn complex patterns in large datasets, enabling advancements in areas like image recognition, speech recognition, and natural language processing.

• In the 2010s, deep learning algorithms achieved significant breakthroughs, such as beating humans at games like Go and poker, and making self-driving cars a reality.

AI in Social Media

•AI algorithms play a significant role in social media by personalizing content, recommending posts, and optimizing ad targeting.

•Platforms like Facebook and Instagram use AI to understand user preferences and behaviors, ensuring that users see the most relevant content.

•AI is also used in monitoring content, detecting harmful behavior, and improving user experience.

Speech Recognition Improvements

Over the past decade, speech recognition technology has improved dramatically, thanks to advances in machine learning and deep learning.

AI-powered voice assistants are now able to understand a wide range of accents, languages, and speech patterns, providing more accurate responses in real-time.

Computer Vision Evolution

The field of computer vision has made significant strides, with AI systems now able to identify and classify objects in images and videos with remarkable accuracy.

AI-powered computer vision is used in a wide range of applications, from facial recognition in security systems to self-driving cars that use cameras to navigate the environment.

Natural Language Processing (NLP) History

NLP has evolved from rule-based systems to deep learning models (e.g., GPT-3).

NLP is widely used in translation, chatbots, and sentiment analysis.

Human Trust in AI Over Time

As AI systems have become more integrated into daily life, human trust in AI has evolved. Initially, there was skepticism about AI's capabilities, but as systems have proven their reliability and usefulness, trust has grown.

However, challenges remain around transparency, ethics, and bias in AI systems, which still impact how people trust AI.

Case Study (IBM Watson)

IBM Watson became famous for winning the quiz show *Jeopardy!* in 2011, showcasing its ability to process and understand natural language.

Watson's success led to its application in various industries, including healthcare, where it helped doctors with medical diagnoses and treatment options by analyzing large volumes of medical literature.

Case Study (Google DeepMind)

Google DeepMind's most notable achievement was the development of AlphaGo, which defeated the world champion Go player in 2016.

AlphaGo used deep reinforcement learning, marking a significant step forward in AI's ability to tackle complex problems. DeepMind's research has also been applied to healthcare and other industries.
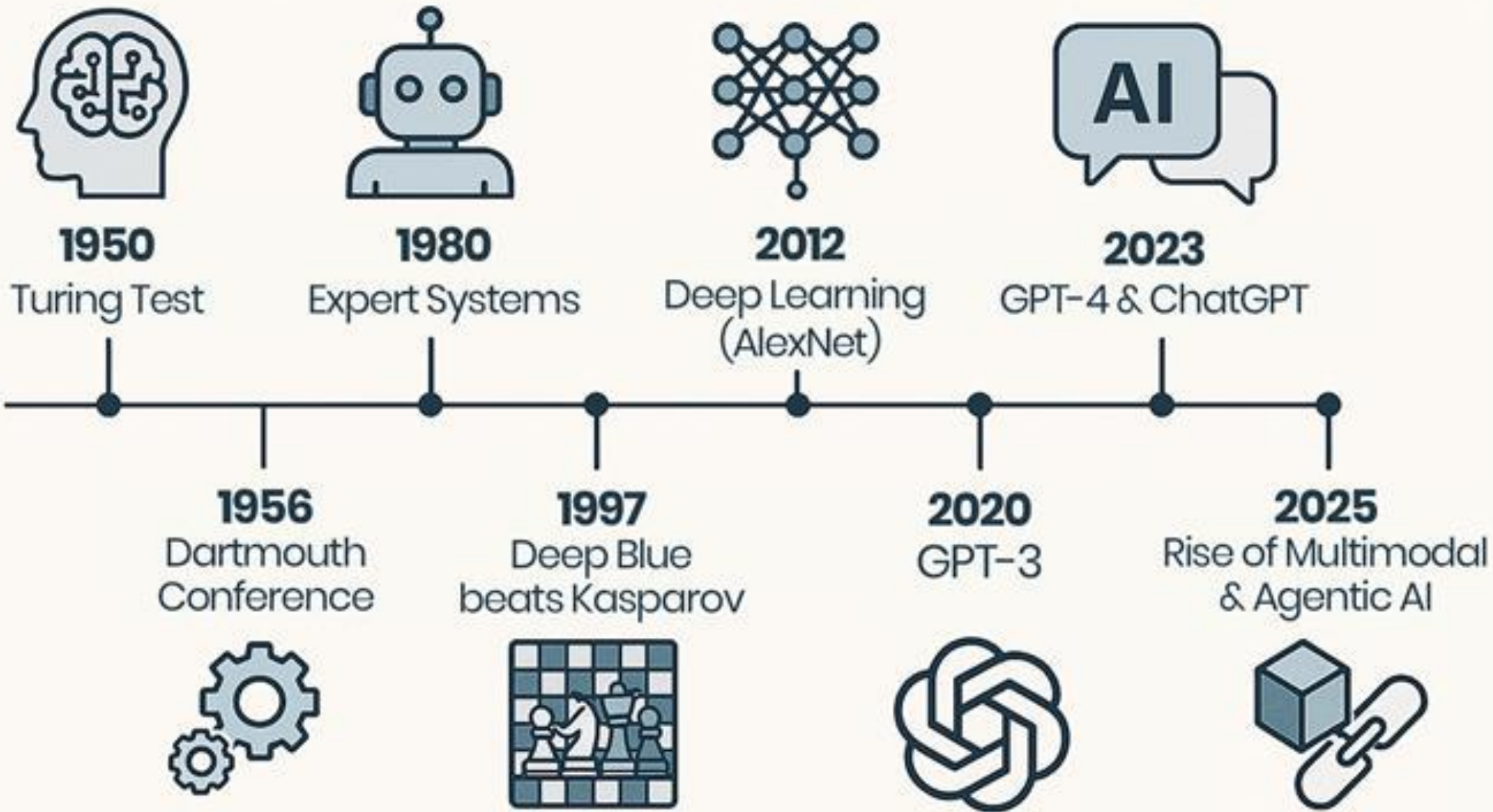
Evolution of Interaction Methods

Early human-AI interaction was limited to text commands, but over time, interfaces evolved to include graphical user interfaces (GUIs), touchscreens, and voice assistants.

The future of human-AI interaction may include more immersive experiences, such as virtual or augmented reality (VR/AR) and brain-computer interfaces (BCI).

HISTORY OF ARTIFICIAL INTELLIGENCE

1950
Turing Test

1956
Dartmouth Conference

1980
Expert Systems

1997
Deep Blue beats Kasparov

2012
Deep Learning (AlexNet)

2020
GPT-3

2023
GPT-4 & ChatGPT

2025
Rise of Multimodal & Agentic AI

Thanks