

# *Educating For Careers*



**Adapting to Change**

**March 3-5, 2024**

**Empowering Educators to Equip  
Students for AI-infused Careers**

**Amy Kaufman  
Senior Advisor, Talent Strategies  
CEO Leadership Alliance**



FUTURE

PRESENT

PAST

100 rotating drums

10 miles of wire

1 million soldered connections

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# A BRIEF HISTORY OF ARTIFICIAL INTELLIGENCE



**Alan Turing** released a test to test for Machine Intelligence.

1950

A timeline from the 1940's to the 2000's.

1942

The **Enigma** machine was decoded using AI, during WWII.

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A BRIEF HISTORY OF  
ARTIFICIAL  
INTELLIGENCE



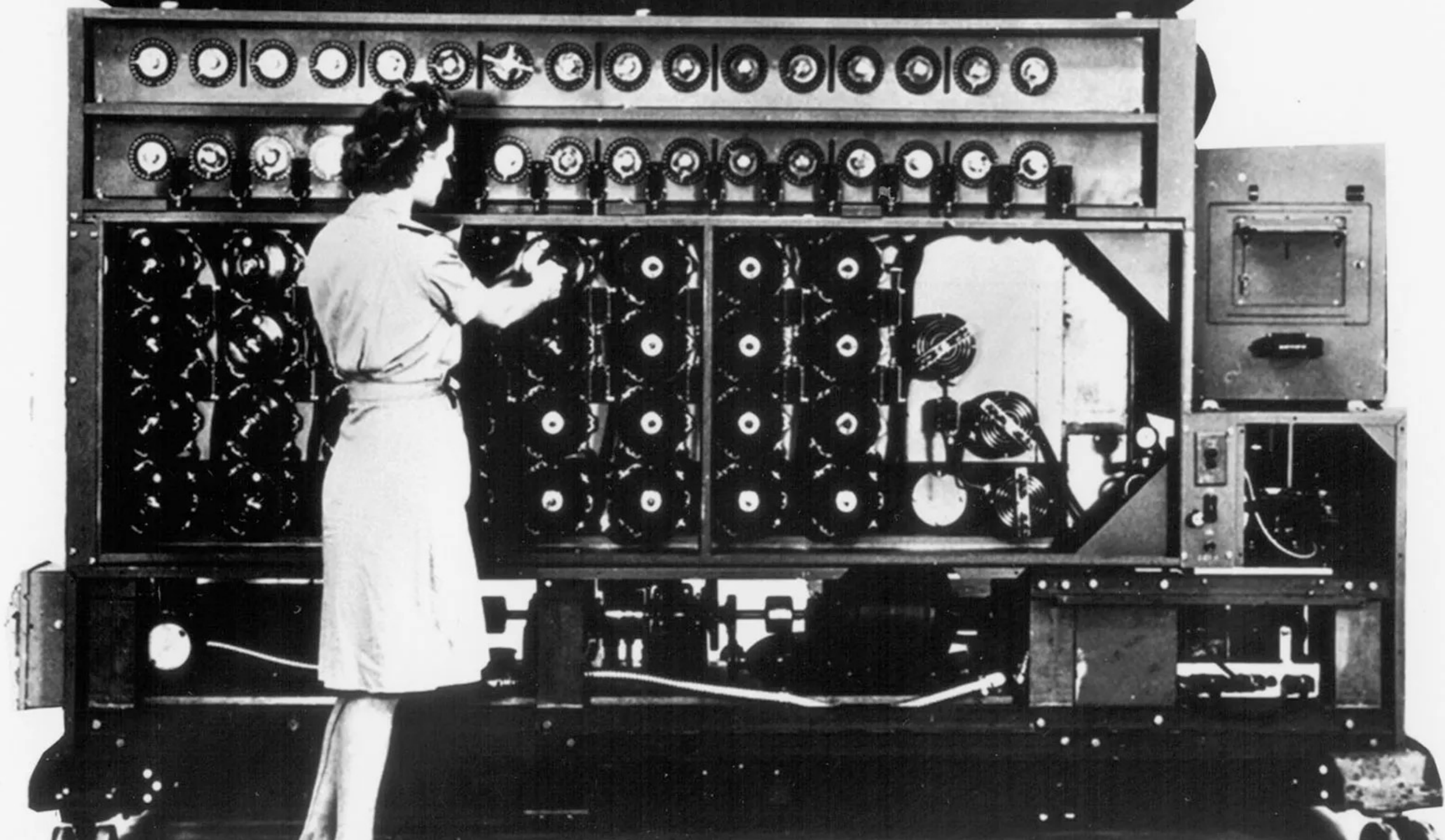


Alan Turing was a British mathematician and computer scientist.

Considered the father of theoretical computer science and artificial intelligence.

He made major contributions to theoretical computer science and cryptanalysis.

During World War II, Turing he helped break German ciphers.











1955

**John McCarthy**- the Father of AI, was the first to coin the term.



1961

The introduction of **Unimate**, the first industrial robot.



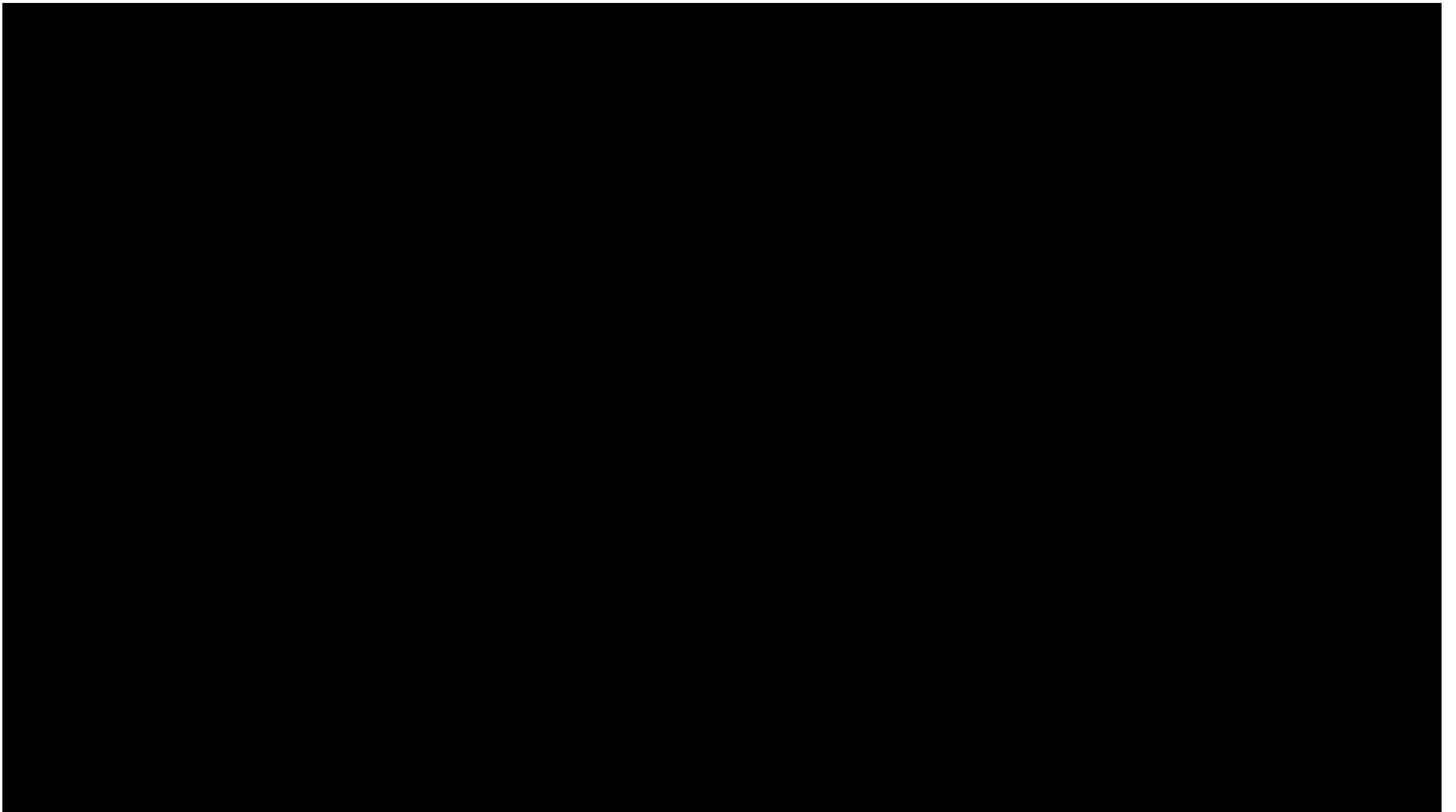
1964

The first chatbot was invented by **Joseph Weizenbaum**.



1969

**Shakey** - the first general purpose mobile robot was introduced.





1997

Supercomputer **Deepblue** beats chess legend Garry Kasparov.

1998

The birth of **Kismet**, a robot equipped with emotions.

2002

**Roomba** - a highly efficient AI-powered vacuum cleaner.

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A BRIEF HISTORY OF  
**ARTIFICIAL  
INTELLIGENCE**

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A BRIEF HISTORY OF  
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@sky\_super\_cat

A BRIEF HISTORY OF  
**ARTIFICIAL  
INTELLIGENCE**

2011

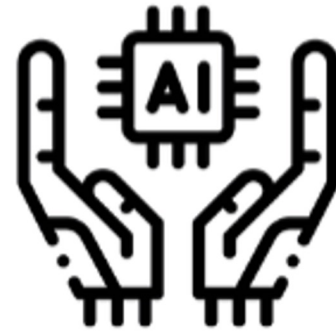
Introduction of **Siri**, a voice-assistant powered by Apple.

2011

**IBM Watson** - A question-answering computer system.

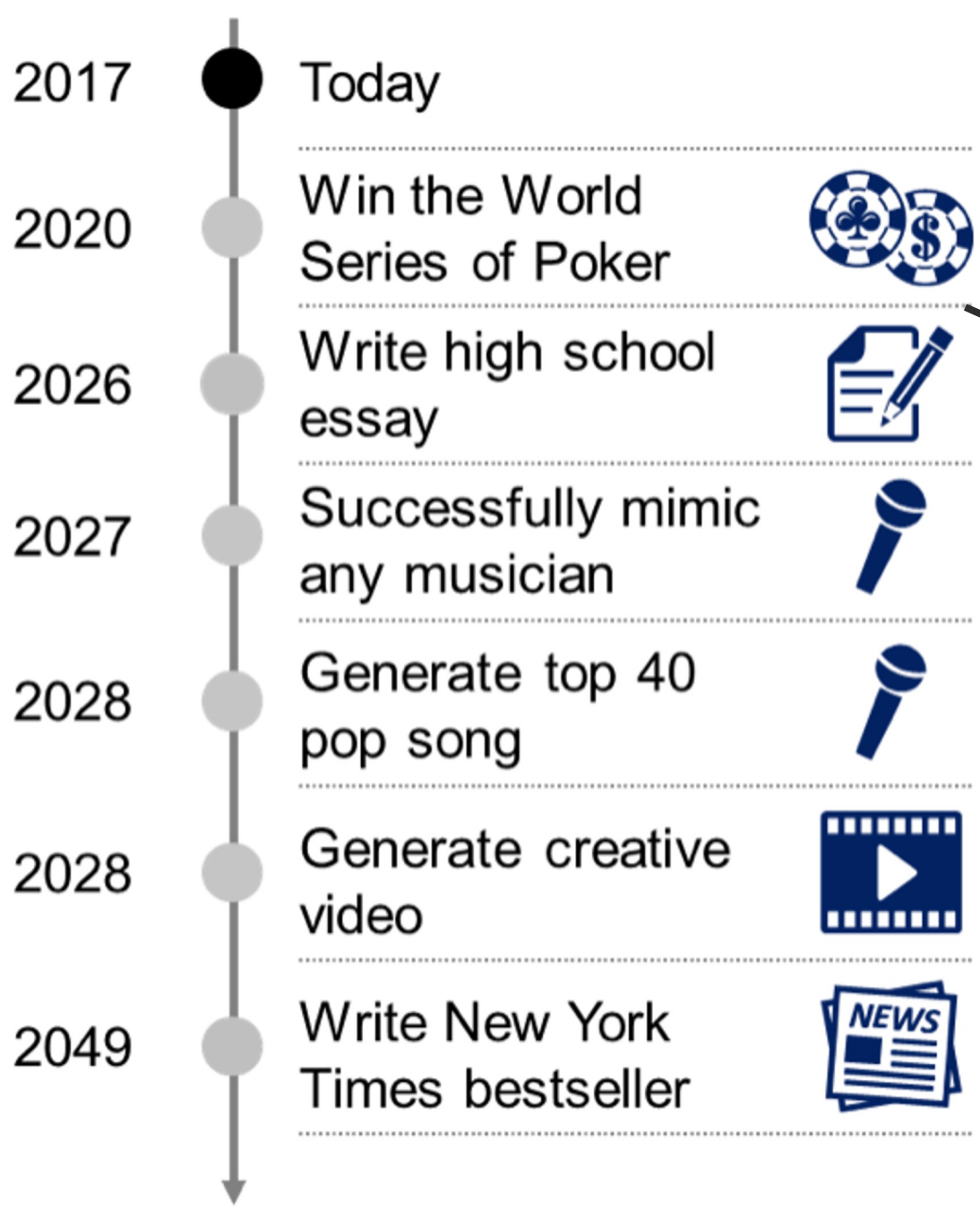
2014

**Alexa**, a virtual-assistant system developed by Amazon.

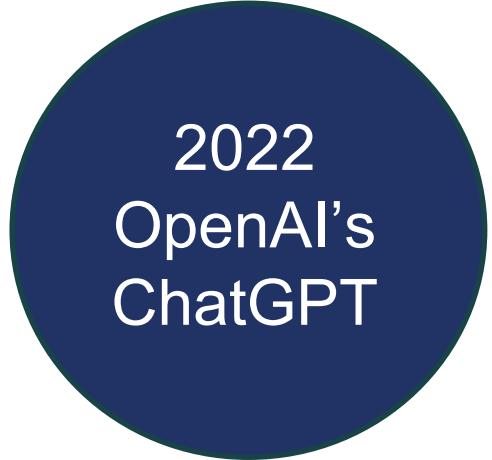


BY VERLOOP.IO

A BRIEF HISTORY OF  
**ARTIFICIAL  
INTELLIGENCE**



**2017**  
**World Economic Forum Predictions**  
**about AI**



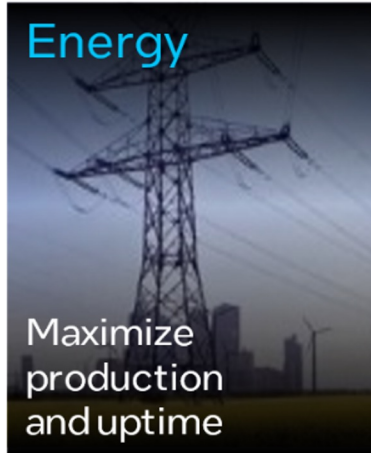


# AI Fueled World



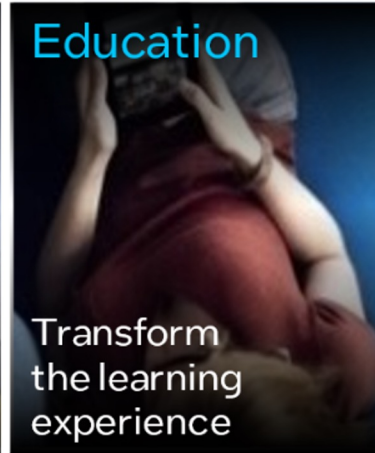
**Agriculture**

Achieve higher yields & increase efficiency



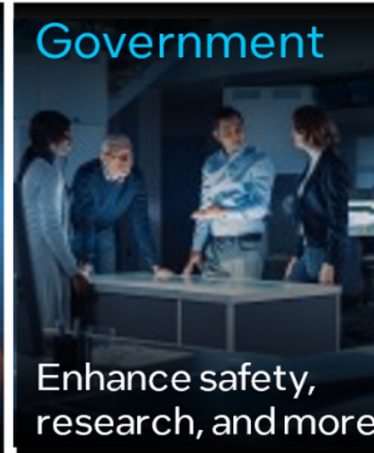
**Energy**

Maximize production and uptime



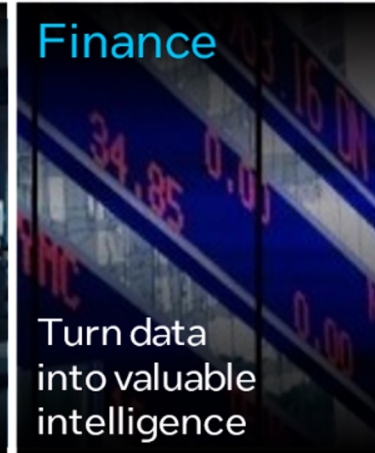
**Education**

Transform the learning experience



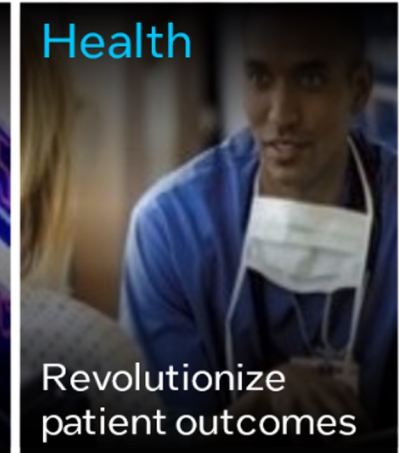
**Government**

Enhance safety, research, and more



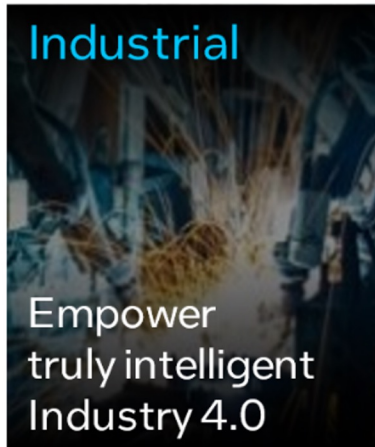
**Finance**

Turn data into valuable intelligence



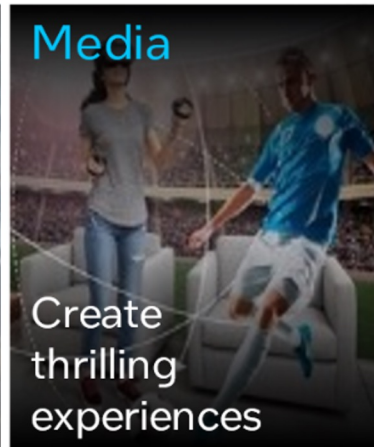
**Health**

Revolutionize patient outcomes



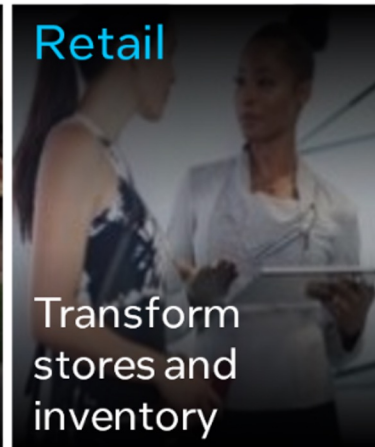
**Industrial**

Empower truly intelligent Industry 4.0



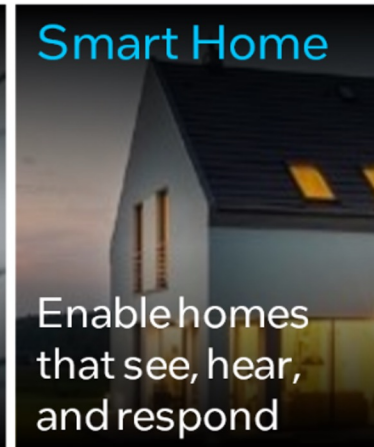
**Media**

Create thrilling experiences



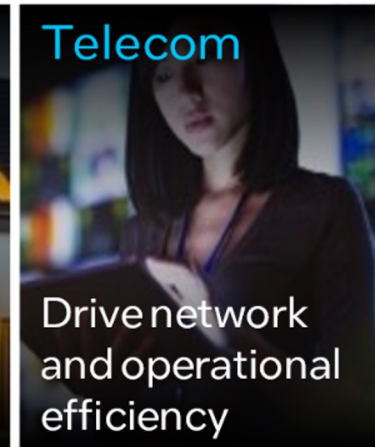
**Retail**

Transform stores and inventory



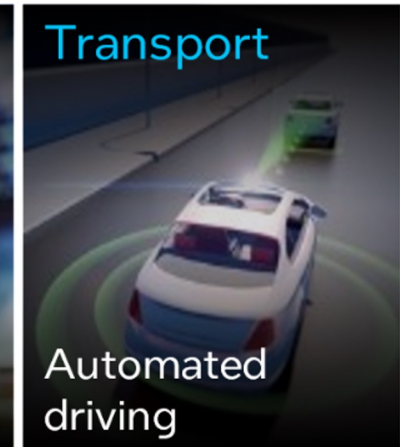
**Smart Home**

Enable homes that see, hear, and respond



**Telecom**

Drive network and operational efficiency



**Transport**

Automated driving

AI is considered new electricity

# The Rise of New Job Categories with AI

## Examples of Fusion Skills



### Trainers

- NLP Trainer
- Language Translators
- Machine Trainer on Human Behavior



### Explainers

- Transparency Analyst
- Algorithm Forensic Analyst
- Explainability Strategist



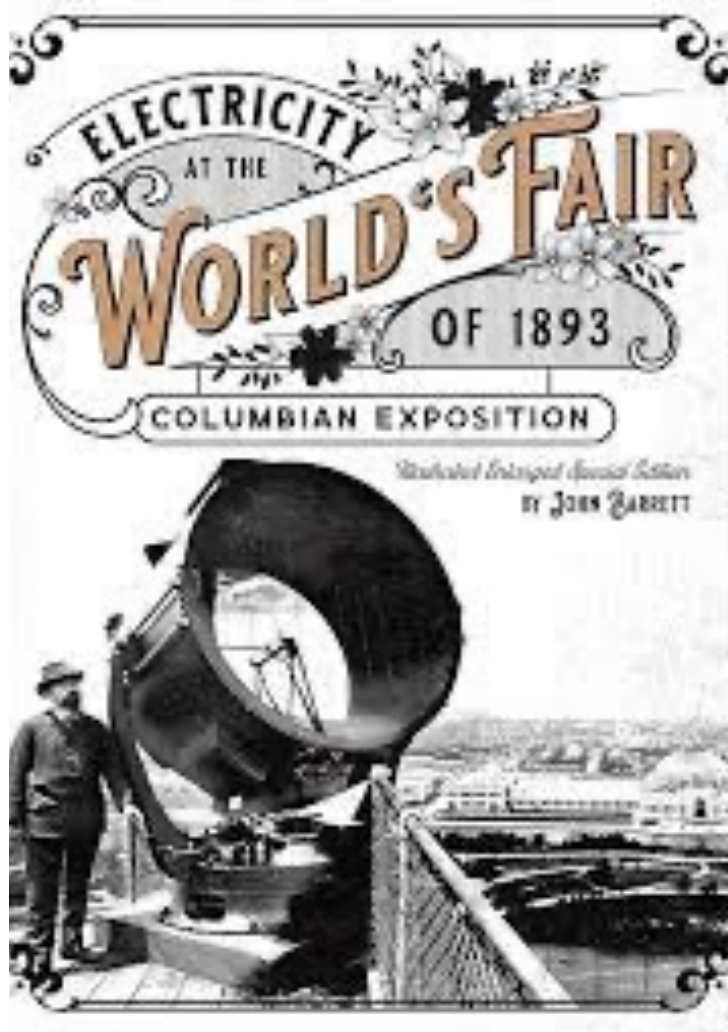
### Sustainers

- Context Designer
- AI Safety Engineers
- Ethics Compliance Managers

Need for AI Readiness for Human Centric/Responsible AI driven jobs



# 2<sup>nd</sup> Industrial Revolution



## Technological Transformation:

AI integration, like electricity's introduction, marked a transformative leap in technology for the future workforce.

## Job Transformation:

AI, similar to electricity in manufacturing, transforms jobs, automating routine tasks, and giving rise to new roles in development, maintenance, and ethical oversight.

## Differences:

1. **Nature of Automation:** Mechanized physical tasks; AI goes further, automating both physical and cognitive tasks across diverse sectors beyond manufacturing.
2. **Skill Requirements:** AI demands skills in digital literacy, data analysis, and collaboration with intelligent systems, diverging from the manual and mechanical skills of the 2nd Industrial Revolution.
3. **Global Collaboration:** AI promotes global collaboration through digital connectivity, contrasting with the 2nd Industrial Revolution's focus on regional industrial advancements.
4. **Ethical Considerations:** AI's ethical challenges, including data privacy and algorithmic fairness, pose a distinct concern not prevalent in the 2nd Industrial Revolution, necessitating continuous attention and regulation.

# 3rd Industrial Revolution



## Technological Transformation:

AI integration, like the internet, marked a transformative leap in advanced technologies becoming integral to daily life and work processes.

## Job Transformation:

The internet led to the digital economy's rise; AI is anticipated to drive economic progress, emphasizing innovation, efficiency, and new business models.

## Differences:

### 1. Nature of Automation:

Highlighted digitalization and the internet; AI advances further with machine learning and cognitive capabilities, impacting a wider range of tasks and industries.

2. **Skill Requirements:** The skill requirements for AI adoption include a focus on data science, machine learning, and collaboration with intelligent systems. In contrast, the 3rd Industrial Revolution emphasized digital literacy, coding, and skills related to the use of internet technologies.

3. **Global Collaboration:** AI fosters global collaboration on an unprecedented scale, facilitated by digital connectivity.

4. **Ethical Considerations:** Internet ethics emphasize privacy, cybersecurity, and information accuracy, while AI introduces additional concerns such as data bias, transparency, and job displacement.

# The Five Big Ideas of AI

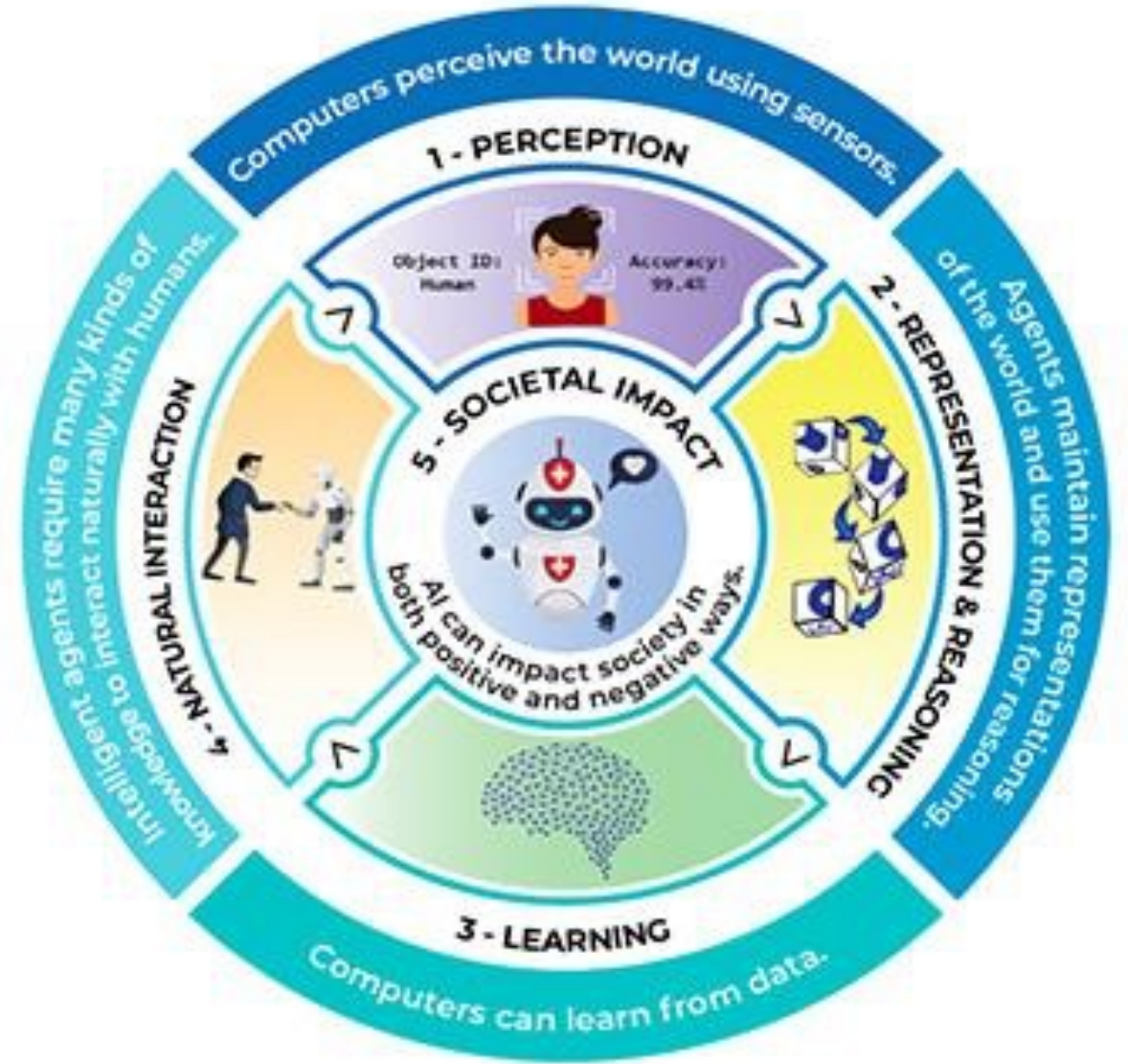
Perception

Representation and Reasoning

Learning

Natural Interaction

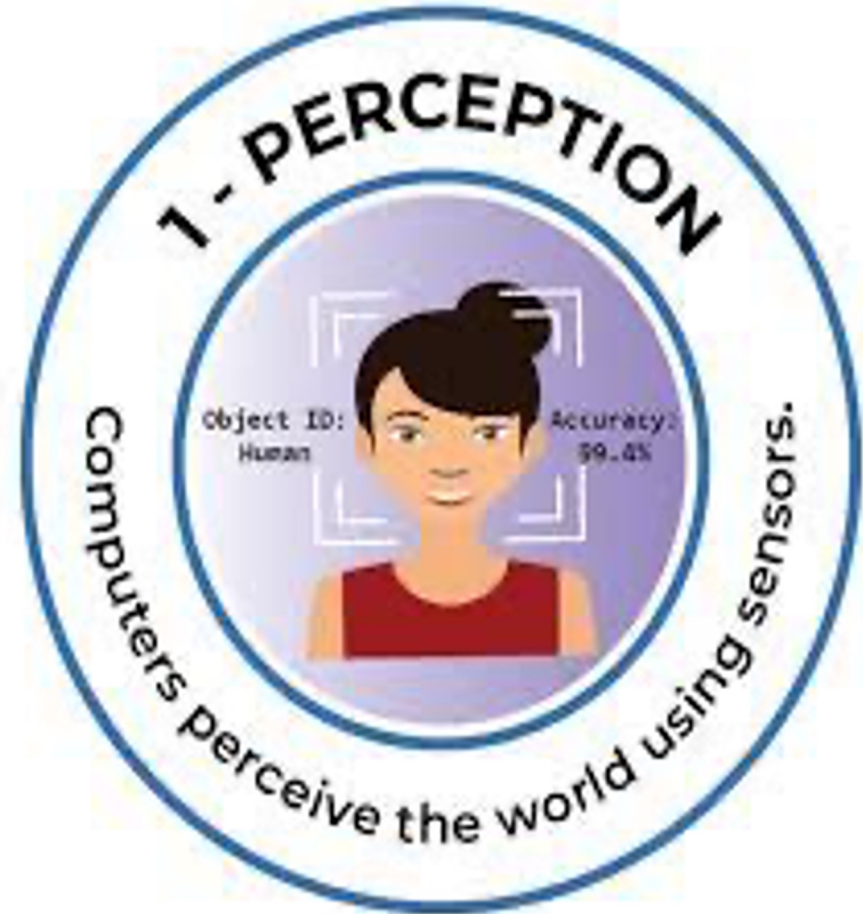
Societal Impact





# Perception

- Computers perceive the world using sensors.
- Perception is the process of extracting meaning from sensory signals.
- Making computers “see” and “hear” well enough for practical use is one of the most significant achievements of AI to date.



# Perception (IRL)

- In autonomous vehicles, AI uses sensors like cameras, lidar, and radar to interpret the environment, making real-time decisions for safe navigation.
- Perception enables the autonomous vehicle to make real-time decisions, such as adjusting speed, changing lanes, and responding to traffic conditions, contributing to safe and efficient navigation.



# Representation and Reasoning

- Agents use representations for reasoning in AI.
- Constructed through data structures, these representations support deriving new information.
- AI agents handle complex problems but differ from human thinking.



# Representation and Reasoning

- Representation and reasoning in AI is found in virtual assistants like Amazon's Alexa or Apple's Siri.
- Using reasoning algorithms, virtual assistants process user information, derive intent from queries, and provide relevant responses





# Learning

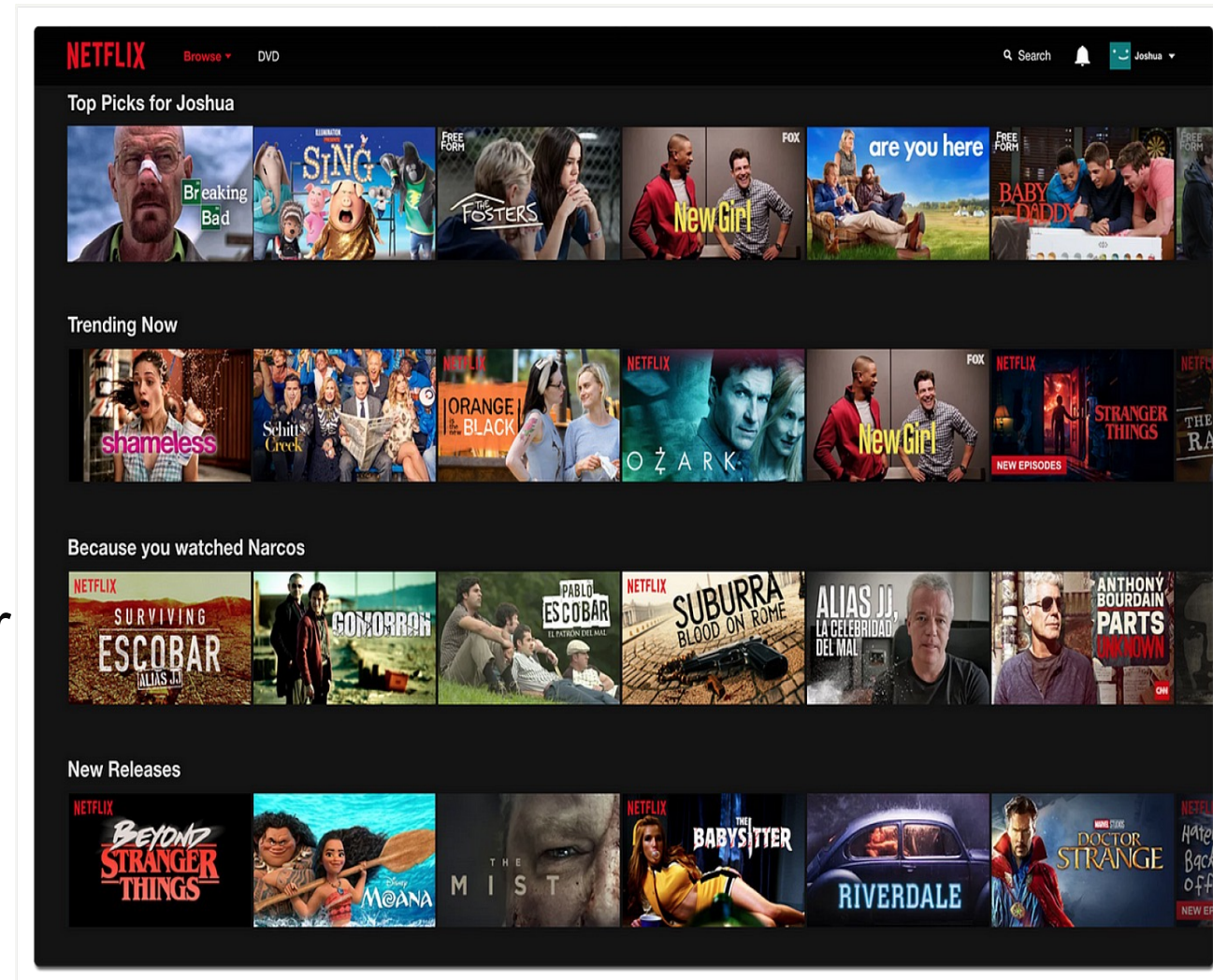
- Computers learn through machine learning, finding patterns in data.
- AI progress is driven by learning algorithms creating new data representations.
- Successful implementation requires substantial training data.
- Data is usually supplied by humans but can be acquired by machines.





# Learning

- Netflix employs AI for personalized content recommendations.
- Algorithms analyze user preferences and viewing history.
- Continuous learning enhances recommendations for improved user satisfaction.



# Natural Interaction

- Intelligent agents require diverse knowledge for natural collaboration.
- Ideal interaction includes natural language, cultural knowledge, and emotional responsiveness.
- Deep neural networks, like large language models, enable these advanced capabilities.
- Progress in technology enhances human-like interactions with intelligent agents.



# Natural Interaction

- Distinct from Alexa or Siri, "ChatGPT" by OpenAI exemplifies natural interaction in AI by responding to user input in conversational, human-like language
- ChatGPT employs advanced natural language processing to understand and generate contextually relevant responses.
- Users can engage with ChatGPT in a seamless and intuitive manner, making it a practical and effective example of natural interaction in AI.





# Societal Impact

- AI has positive and negative impacts on society.
- It transforms various aspects of life but requires consideration of potential harms.
- Biases in training data should be addressed.
- Ethical criteria are essential for AI design and deployment.



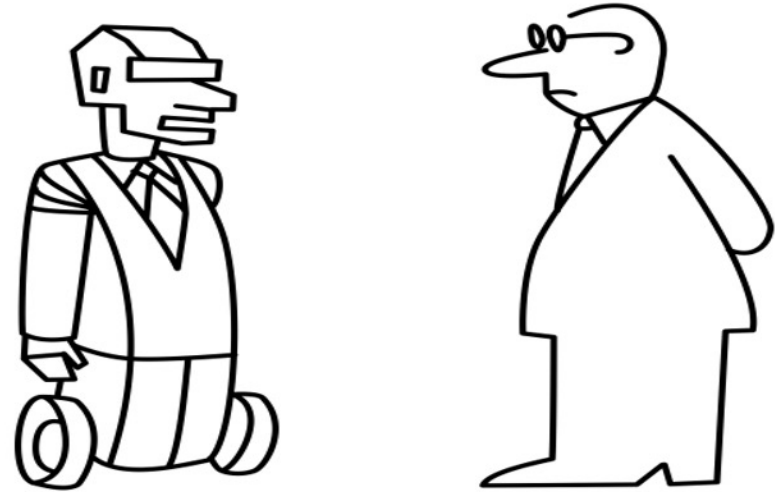
# Societal Impact

## Positive Societal Impact:

- AI enhances healthcare diagnostics, aiding in early and precise disease detection through accurate analysis of medical images.

## Negative Societal Impact:

- Facial recognition AI exhibits biases, particularly against certain demographics, leading to discriminatory outcomes and privacy concerns.



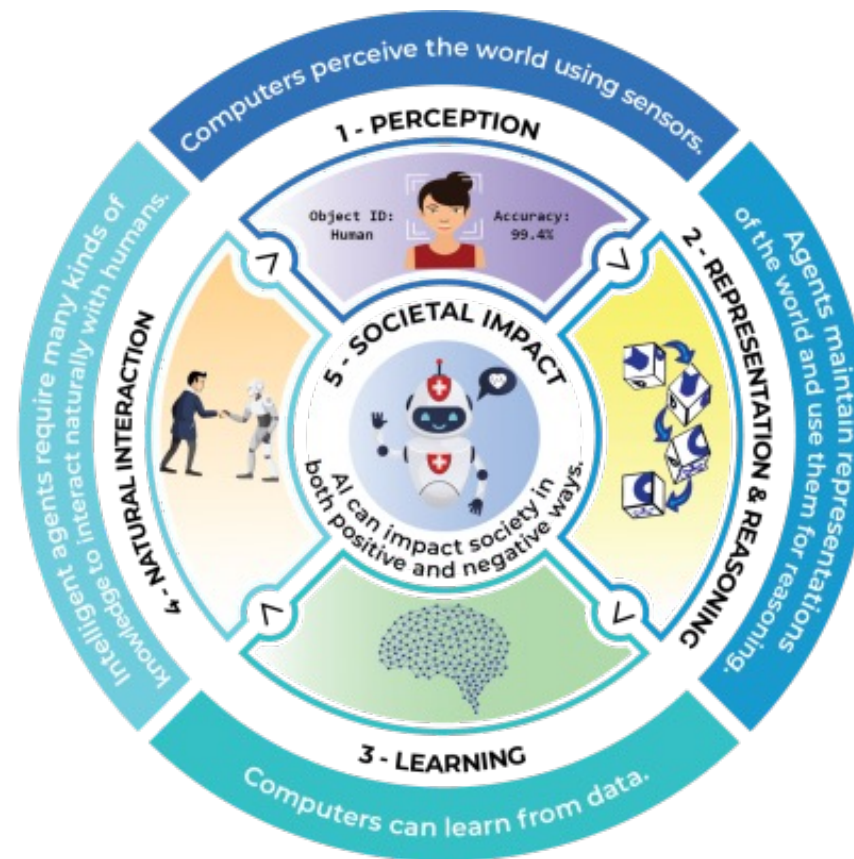
*“The good news is I have discovered inefficiencies.  
The bad news is that you’re one of them.”*

“Integrating the 5 Big Ideas of AI into K-12 education is a forward-looking strategy that supports educational goals by fostering critical thinking, creativity, problem-solving, ethical awareness, and career readiness.

This approach not only equips students with AI knowledge but also prepares them to be informed and responsible citizens in an increasingly AI-driven world.

The 5 Big Ideas of AI provide a solid foundation for AI education that aligns with the broader educational mission of preparing students for success in college/career for today and into the future.”

--California Department of Education  
Learning about AI, Learning with AI



The AI4K12 Initiative is a joint project of:



Generously funded by



National Science Foundation  
ITEST Program (DRL-1846073)

Carnegie Mellon University  
School of Computer Science



Big Idea #5: Societal Impact		AI can impact society in both positive and negative ways.			
Concept		K-2	3-5	6-8	9-12
<p><b>AI &amp; The Economy</b> <i>(Effects on Employment)</i></p> <p><b>5-C-ii</b></p>	<p><b>LO:</b> Describe some jobs that no longer exist due to advances in technology.</p> <p><b>EU:</b> New technology changes the types of jobs that are available for people.</p> <p><b>Unpacked:</b> The automobile reduced our reliance on horses, which eliminated jobs for farriers and horse trainers but created jobs for auto mechanics. Factory automation enabled mass production, which reduced the need for blacksmiths, yarn spinners, and weavers but created jobs for people who build and maintain the factories.</p>	<p><b>LO:</b> Describe how a job will change due to the introduction of AI or robotic technologies.</p> <p><b>EU:</b> As AI and robotic technologies are adopted in the workplace, the ways people perform their jobs will change.</p> <p><b>Activity:</b> Students can read grade-appropriate articles that describe jobs being upated with the use of AI technologies and robots, e.g., warehouse workers working alongside robots.</p>	<p><b>LO:</b> Predict a new type of job that might arise, or how an existing type of job might change or go away, as a result of the adoption of AI technologies.</p> <p><b>EU:</b> Cultures change as new technologies are adopted, and as a result some types of jobs are reduced and new types of jobs appear.</p> <p><b>Activity:</b> Develop a "job description" of the future for a given profession - what will working with AI and robotic systems look like? What skills will be required?</p>	<p><b>LO:</b> Investigate the skills needed for AI-enabled careers.</p> <p><b>EU:</b> AI-aligned skills will be relevant throughout the workforce, not just for programmers. Most types of work will involve some interaction with AI technologies.</p> <p><b>Unpacked:</b> As new technologies are adopted, the nature of work will change over a person's lifetime. People can expect to learn continually throughout their careers. AI-aligned skills that are becoming important include: collecting and curating datasets for machine learning; interacting with intelligent agents that help people do their jobs; training robots to complete specific tasks; use of AI-powered creative tools for image creation and manipulation; and knowledge engineering for AI systems.</p>	
<p><b>AI &amp; the Economy</b> <i>(Impacts of AI on Sectors of Society)</i></p> <p><b>5-C-i</b></p>	<p><b>LO:</b> Identify current uses of AI and how they have impacted society.</p> <p><b>EU:</b> Society has undergone changes because of AI and this will continue in the future.</p> <p><b>Unpacked:</b> AI currently affects things like how we get questions answered, how we get directions, and how we find entertainment.</p>	<p><b>LO:</b> Identify changes in how sectors of society operate due to the introduction of AI.</p> <p><b>EU:</b> Every sector of society is changing (or will change) as a result of the introduction of AI.</p> <p><b>Unpacked:</b> Sectors of society include manufacturing, retail, agriculture, food, hospitality, transportation, housing, environment, education, entertainment, healthcare, finance, government, public safety, social services, and law enforcement. An example of change: manufacturing is taking advantage of increased automation using AI to reduce costs and improve quality.</p> <p><b>Activity:</b> Research a story and describe how an AI transformative change impacted society positively and potentially negatively.</p>	<p><b>LO:</b> Compare the changes AI is bringing to society with those of previous industrial revolutions.</p> <p><b>EU:</b> AI is causing societal advances and disruptions comparable to earlier industrial revolutions.</p> <p><b>Unpacked:</b> The first industrial revolution was based on mechanical power, the second on electricity and mass production, and the third on computers and networking. The fourth will be based on AI, robotics, Internet of Things, and genetic engineering technologies.</p>	<p><b>LO:</b> Predict how a sector of society is likely to change in the short and intermediate term as a result of AI technology.</p> <p><b>EU:</b> Anticipating and planning for the changes new technology brings is important for the healthy advancement of society.</p> <p><b>Unpacked:</b> Two types of impacts associated with AI technoogy are increased levels of automation and new types of services. Roy Amara, past president of The Institute for the Future, coined Amara's Law which states:" We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run."</p> <p><b>Activities:</b> (1) Discuss possible new services that can evolve due to AI. (2) Identify and explain an unintended consequence in society that resulted from an AI system.</p>	

