

# AI - what is it?

## (And should we be worried about it?)

Sue Lakin July 2024

# **Artificial Intelligence (AI)**

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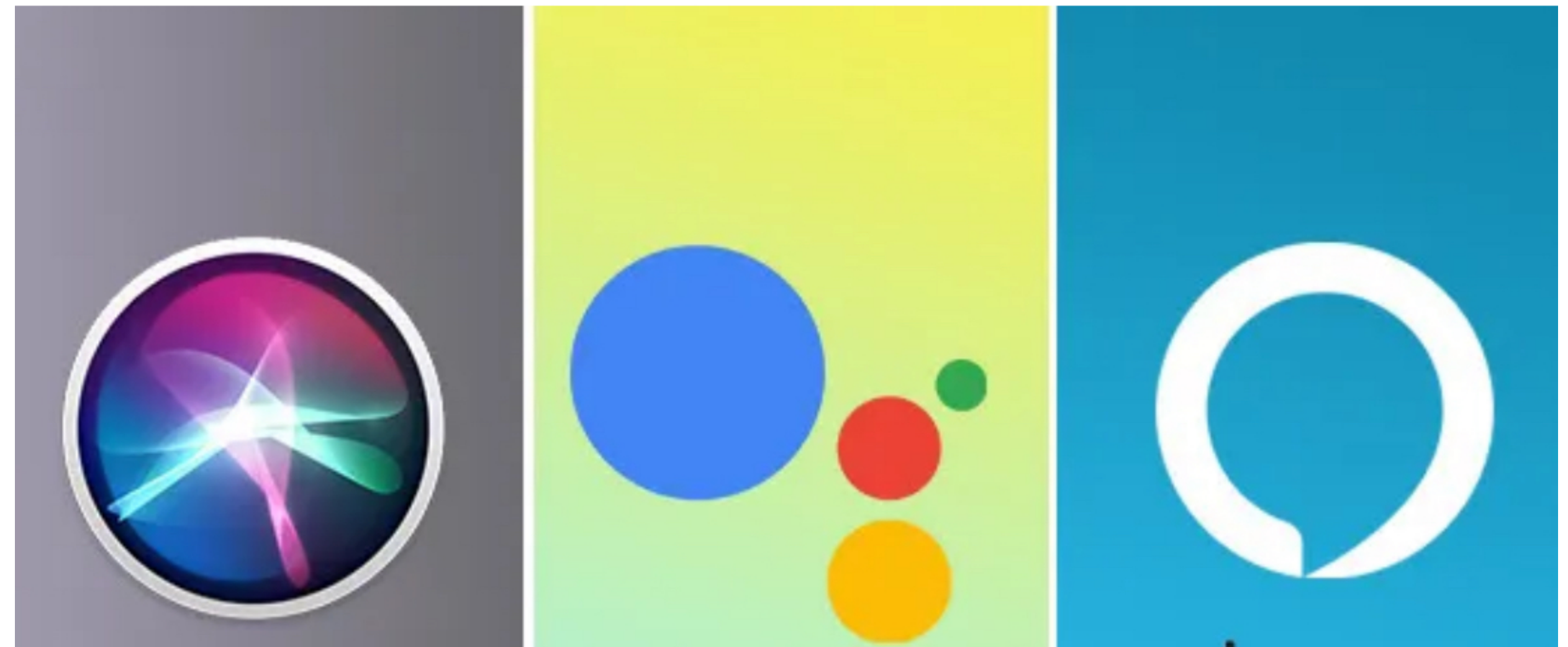
**These tasks include understanding language, recognizing patterns, solving problems, and making decisions.**

**There are different types of AI, but the two main categories are Narrow AI and General AI.**

# What is AI?

## Two types of AI

- **Narrow AI** is designed to perform a specific task, like voice assistants (Siri or Alexa), recommendation systems on Netflix or Amazon, and even spam filters in your email. These systems are very good at what they do, but they can't perform tasks outside their specific function



# What is AI?

## Two types of AI

- **General AI** is more like the AI you see in movies – a machine with the ability to understand, learn, and apply intelligence across a wide range of activities, just like a human. However, this type of AI is still largely theoretical and doesn't exist yet.



# 1 Artificial Intelligence

Development of smart systems and machines that can carry out tasks that typically require human intelligence

## 2 Machine Learning

Creates algorithms that can learn from data and make decisions based on patterns observed  
Require human intervention when decision is incorrect

### 3 Deep Learning

Uses an artificial neural network to reach accurate conclusions without human intervention

# Examples of AI

- Apple Siri/AmazonAlexa/Google Assistant/Microsoft Cortana
- Car infotainment systems
- ChatGPT apps
- Image creators such as <https://openart.ai/create?tab=generation&mode=create>
- Autonomous vehicles
- Breast Cancer diagnosis and treatment (see ChatGPT query)



**The future benefits of AI are vast and transformative, touching nearly every aspect of human life.**

**Here are some key areas where AI is expected to bring significant advancements....**

# The potential benefits of AI are immense

## 1. Healthcare

- Personalized Medicine
- Early Diagnosis
- Drug Discovery

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## 1. Healthcare

- Personalized Medicine: AI can analyze genetic information, lifestyle data, and medical history to tailor treatments for individual patients, improving outcomes and reducing side effects.
- Early Diagnosis: AI algorithms can detect diseases like cancer and Alzheimer's at much earlier stages than traditional methods, leading to earlier and more effective treatments.
- Drug Discovery: AI can accelerate the development of new drugs by predicting how different compounds will behave, drastically cutting down the time and cost involved in bringing new medicines to market.

# The potential benefits of AI are immense

## 2. Education

- Personalized Learning
- Tutoring and Support
- Administrative Efficiency

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## 2. Education

- **Personalized Learning:** AI can create customized learning plans for students based on their strengths, weaknesses, and learning styles, ensuring that each student receives the support they need.
- **Tutoring and Support:** AI-powered tutoring systems can provide students with additional help outside of the classroom, offering explanations and practice problems tailored to their needs.
- **Administrative Efficiency:** AI can handle administrative tasks such as grading and scheduling, allowing teachers to focus more on instruction and student engagement.

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## 3. Environment

- Climate Change Mitigation
- Conservation Efforts
- Resource Management

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## 3. Environment

- Climate Change Mitigation: AI can optimize energy use in buildings, improve the efficiency of renewable energy sources, and even predict and manage the impacts of natural disasters.
- Conservation Efforts: AI can help track and protect endangered species by analyzing data from cameras, drones, and sensors in natural habitats.
- Resource Management: AI can improve the management of natural resources like water and agriculture by predicting weather patterns and optimizing irrigation and crop rotation.

# The potential benefits of AI are immense

## 4. **Transportation**

- Autonomous Vehicles
- Traffic Management
- Logistics and Supply Chains

# The potential benefits of AI are immense

## 4. Transportation

- Autonomous Vehicles: AI-driven cars, trucks, and drones can reduce traffic accidents, improve fuel efficiency, and make transportation more accessible to people who are unable to drive.
- Traffic Management: AI can optimize traffic flow in cities, reducing congestion and emissions by adjusting traffic signals and providing real-time route recommendations.
- Logistics and Supply Chains: AI can streamline logistics operations, ensuring that goods are transported and delivered more efficiently and with fewer delays.

# The potential benefits of AI are immense

## 5. **Work & Productivity**

- Automation of Repetitive Tasks
- Decision Support
- Enhanced Collaboration

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## 5. **Work & Productivity**

- Automation of Repetitive Tasks: AI can take over mundane and repetitive tasks, freeing up human workers to focus on more complex and creative work.
- Decision Support: AI can analyze vast amounts of data to provide insights and recommendations, helping businesses make better-informed decisions.
- Enhanced Collaboration: AI can facilitate better communication and collaboration among teams, using natural language processing to transcribe meetings, summarize discussions, and highlight action items.

# The potential benefits of AI are immense

## 6. **Entertainment**

- Content Creation
- Personalized Experiences
- Interactive Media

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## 6. Entertainment

- Content Creation: AI can generate music, art, and stories, providing new forms of entertainment and tools for creators.
- Personalized Experiences: AI can tailor entertainment options to individual preferences, ensuring that people always have something they enjoy watching, reading, or listening to.
- Interactive Media: AI can enhance video games and virtual reality experiences by creating more responsive and immersive environments.

# The potential benefits of AI are immense

## 7. **Safety & Security**

- Crime Prevention
- Cybersecurity
- Disaster Response

# The potential benefits of AI are immense

## 7. Safety & Security

- Crime Prevention: AI can analyze patterns to predict and prevent criminal activity, helping law enforcement allocate resources more effectively.
- Cybersecurity: AI can detect and respond to cyber threats more quickly than human analysts, protecting sensitive data and systems from attacks.
- Disaster Response: AI can assist in disaster response efforts by predicting the impact of natural disasters and coordinating rescue and relief operations.

**However, realizing these benefits will require careful management and regulation to address ethical concerns and ensure that AI is used responsibly.**

**The rise of Artificial Intelligence (AI) brings numerous benefits, but it also raises significant concerns.**

**These concerns span ethical, social, economic, and existential dimensions.**

**Here are some of the main worries about AI.....**

# 1. Privacy and Surveillance

- **Data Collection:** AI systems often require large amounts of data to function effectively. This data collection can lead to privacy invasions, as personal information is harvested, stored, and analyzed without individuals' explicit consent.
- **Surveillance:** AI-powered surveillance technologies, such as facial recognition, can be used to monitor and track individuals, raising concerns about mass surveillance and the erosion of civil liberties. In some regimes, these technologies can be used to suppress dissent and monitor citizens' activities.



## 2. Bias and Discrimination

- Biased Algorithms: AI systems can inherit biases present in the data they are trained on. If the training data reflects societal biases, the AI can perpetuate and even amplify these biases, leading to unfair and discriminatory outcomes. For example, biased hiring algorithms can disadvantage certain groups based on race or gender.
- Inequality: Access to AI technology and its benefits is often unevenly distributed, potentially exacerbating existing social and economic inequalities.



### 3. Job Displacement and Economic Impact

- Automation of Jobs: AI has the potential to automate a wide range of tasks, leading to job displacement in sectors such as manufacturing, transportation, and customer service. This displacement can result in significant economic disruption and require large-scale retraining and education efforts.
- Economic Inequality: The benefits of AI could be concentrated among those who control and develop the technology, leading to greater economic inequality between different social and economic groups.



# 4. Security and Safety

- Autonomous Weapons: The development of AI-powered autonomous weapons raises ethical concerns about their use in warfare. These weapons could make decisions without human intervention, potentially leading to unintended and devastating consequences.
- Cybersecurity Risks: AI can be used to enhance cyberattacks, making them more sophisticated and harder to detect. This raises concerns about the security of sensitive data and critical infrastructure.



## 5. Ethical and Moral Questions

- Decision-Making: AI systems can make decisions that have significant ethical implications, such as determining who gets a loan or what medical treatment a patient receives. There are concerns about the transparency and accountability of these decision-making processes.
- Human Autonomy: As AI systems become more integrated into daily life, there are concerns about the erosion of human autonomy and the potential for individuals to become overly reliant on AI for decision-making.



# 6. Existential Risks

- Superintelligent AI: There is a theoretical concern about the development of superintelligent AI systems that surpass human intelligence. Such systems could potentially act in ways that are beyond human control or comprehension, posing an existential risk to humanity.
- Control and Alignment: Ensuring that AI systems act in alignment with human values and goals is a significant challenge. There are concerns about our ability to control advanced AI systems and prevent them from causing harm.



## 7. Legal and Regulatory Challenges

- Lack of Regulation: The rapid pace of AI development has outstripped the ability of regulatory frameworks to keep up. There is a need for robust regulations that ensure the safe and ethical development and use of AI.
- Liability Issues: Determining liability in cases where AI systems cause harm or make incorrect decisions is complex. This raises questions about accountability and legal responsibility.



**While AI offers immense potential benefits, it also raises serious concerns that need to be addressed proactively. Ensuring the responsible and ethical development of AI requires collaboration between technologists, policymakers, and society at large.**

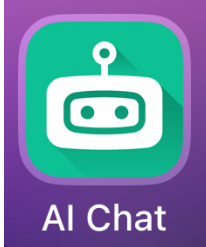

**By addressing these concerns through thoughtful regulation, ethical guidelines, and public awareness, we can harness the power of AI while minimizing its risks and ensuring it serves the greater good.**

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# Resources and Links

- U3A AI Library/Resource Area <https://u3acomunities.org/interest-groups/computing/ai-for-everyone/>
- Royal Institute Christmas Lectures 2023
  - <https://www.rigb.org/christmas-lectures>
  - <https://www.bbc.co.uk/iplayer/episode/m001tv7s>
  - <https://www.bbc.co.uk/iplayer/episode/m001tv98>
  - <https://www.bbc.co.uk/iplayer/episode/m001tv91>
- AI Apps
  - “AI Chat” available from app stores 
  - “ChatGPT” available from app stores 
  - Openart.AI <https://openart.ai/create?tab=generation>