Indian Health Service

Artificial Intelligence and You

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JUNE 16, 2026

Introduction to Artificial Intelligence (AI)

What is AI?

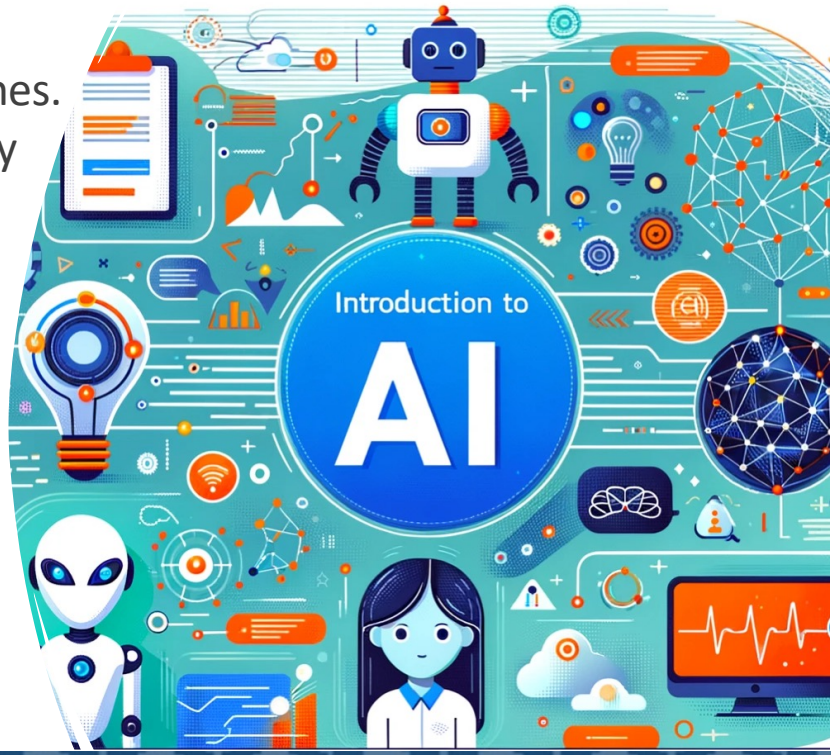
- It's the simulation of human intelligence in machines.
- AI enables machines to perform tasks that typically require human intelligence.

Everyday Examples:

- Virtual assistants like Siri and Alexa.
- Recommendation systems on Netflix and Amazon.

Why It Matters:

- AI is becoming an integral part of our daily lives.
- It helps improve efficiency, convenience, and decision-making.



AI in Your Daily Life

Smart Home Devices - Thermostats (e.g., Nest), security cameras, and smart lights adjust to your habits.

Virtual Assistants - Siri, Alexa, and Google Assistant help with tasks, reminders, and information.

Online Shopping - Personalized recommendations on Amazon and other e-commerce sites.

Entertainment - Netflix and Spotify suggest movies and music based on your preferences.

Social Media - Facebook, Instagram, and Twitter use AI to curate your feeds and suggest content.

Navigation - GPS apps like Google Maps provide real-time traffic updates and route suggestions.

Finance - AI helps detect fraudulent transactions and manage personal finance apps.

Healthcare - Fitness trackers (e.g., Fitbit) monitor your health metrics.

Customer Service - Chatbots provide quick responses and assistance on websites and apps.

AI in Shopping

- Personalized Recommendations
- Virtual Shopping Assistants
- Dynamic Pricing
- Visual Search
- Inventory Management
- Fraud Detection
- Customer Insights
- Voice Commerce
- Enhanced Search Functions
- Augmented Reality (AR)

AI in Social Media

Personalized Feeds	AI curates your news feed on platforms like Facebook, Instagram, and Twitter. Content is tailored based on your interests and interactions.
Recommendation Systems	Suggests friends, groups, and pages to follow. Recommends posts and advertisements.
Content Moderation	AI detects and removes inappropriate or harmful content. Helps maintain community standards and safety.
Enhanced User Experience	AI-driven features like photo tagging and filters. Automatic organization of memories and highlights.
Chatbots	Provide instant customer service and support within social media apps. Assist businesses in interacting with customers.

AI in Social Media

Trend Analysis	Identifies trending topics and hashtags. Helps users stay updated with current events and popular discussions.
Sentiment Analysis	AI analyzes user comments and reactions to gauge public sentiment. Businesses use this data for market insights and brand management.
Content Creation	AI tools assist in creating engaging content and editing photos/videos. Suggests optimal posting times and strategies.
Privacy and Security	AI monitors for suspicious activities and potential security threats. Protects user accounts from hacking and fraud.

AI in Healthcare

Personal Health Monitoring

- Fitness trackers and health apps monitor physical activity, heart rate, and sleep patterns.
- Examples include Fitbit, Apple Watch, and Google Fit.

Virtual Health Assistants

- Chatbots and virtual assistants provide medical advice and reminders.
- Assist with symptom checking, medication management, and appointment scheduling.

Medical Imaging

- AI analyzes medical images (X-rays, MRIs, CT scans) to detect abnormalities.
- Helps radiologists diagnose conditions faster and more accurately.

Predictive Analytics

- AI predicts disease outbreaks and patient outcomes.
- Assists in early intervention and personalized treatment plans.

Telemedicine

- AI-powered platforms facilitate remote consultations and follow-ups.
- Enhances access to healthcare services, especially in remote areas.

AI in Healthcare

Drug Discovery

- AI accelerates the process of drug discovery and development.
- Identifies potential drug candidates and predicts their efficacy.

Electronic Health Records (EHR)

- AI streamlines the management of patient records.
- Enhances data accuracy and accessibility for healthcare providers.

Robotic Surgery

- AI-powered robots assist in performing precise and minimally invasive surgeries.
- Improves surgical outcomes and reduces recovery time.

Mental Health Support

- AI tools provide therapy and support for mental health conditions.
- Examples include AI-based chatbots and apps for anxiety and depression.

Personalized Medicine

- AI analyzes genetic information to tailor treatments to individual patients.
- Optimizes therapy effectiveness and minimizes side effects.

AI and Privacy

- Data Collection
- Data Usage
- Consent and Transparency
- Data Security
- Anonymization
- Regulations and Compliance
- User Control
- Ethical Data Practices

Future of AI

Advancements in Technology:	• Improvements in AI algorithms and computing power. • Development of more sophisticated systems.
AI in Everyday Life:	• Increased integration of AI in daily activities. • Smarter homes, cities, and personal devices.
Healthcare Innovations:	• AI advancements in medical diagnostics, personalized medicine, and telehealth. • Potential to revolutionize healthcare delivery and patient outcomes.
Autonomous Vehicles:	• Progress towards fully autonomous cars and public transportation. • Enhanced safety and efficiency in transportation systems.
AI in Education:	• Personalized learning experiences and AI tutors. • Improved educational outcomes and accessibility.
AI in Business:	• Enhanced decision-making, customer service, and operational efficiency. • Growth in AI-driven business models and industries.
Ethical AI Development:	• Focus on developing ethical and fair AI systems. • Addressing biases, ensuring transparency, and promoting accountability.
Global Impact:	• AI's role in addressing global challenges such as climate change and poverty. • AI-driven solutions for sustainable development.
AI Regulation and Policy:	• Development of comprehensive AI policies and regulations. • Ensuring responsible and beneficial AI deployment.
Human-AI Collaboration:	• Enhanced collaboration between humans and AI. • AI as a tool to augment human capabilities and creativity.

AI Myths and Misconceptions

AI Will Replace All Jobs

- Myth: AI will cause mass unemployment.
- Reality: AI will transform jobs and create new opportunities, but some roles will be automated.

AI is All-Knowing and Perfect

- Myth: AI systems are infallible and make perfect decisions.
- Reality: AI relies on data and can make mistakes or have biases.

AI Can Think and Feel Like Humans

- Myth: AI systems have emotions and consciousness.
- Reality: AI mimics human behavior but does not possess self-awareness or emotions.

AI is Only for Tech Experts

- Myth: Only experts can understand and use AI.
- Reality: AI applications are designed for everyday use and can benefit everyone.

AI is a Recent Invention

- Myth: AI is a new technology.
- Reality: AI has been in development for decades, with roots tracing back to the 1950s.

AI Myths and Misconceptions

AI Will Take Over the World

- Myth: AI will surpass human intelligence and dominate the world.
- Reality: AI is a tool created and controlled by humans to assist with specific tasks.

AI is Always Expensive and Complex

- Myth: Implementing AI requires significant investment and technical expertise.
- Reality: Many AI applications are accessible and affordable, even for small businesses and individuals.

AI Systems are Fully Autonomous

- Myth: AI can operate independently without human intervention.
- Reality: Most AI systems require human oversight and input for optimal performance.

AI is a Single Technology

- Myth: AI is one uniform technology.
- Reality: AI encompasses various technologies like machine learning, natural language processing, and robotics.

AI is Inherently Dangerous

- Myth: AI poses a constant threat to humanity.
- Reality: AI can be safe and beneficial when developed and used responsibly.

Ethics in AI

Bias and Fairness:	• AI can inadvertently perpetuate biases present in the data it was trained on. • Importance of using diverse and representative datasets.
Privacy Concerns:	• AI systems collect and analyze vast amounts of personal data. • Ensuring data is used responsibly and securely.
Transparency:	• AI decision-making processes can be opaque. • Need for explainable AI that users can understand and trust.
Accountability:	• Determining who is responsible when AI systems fail or cause harm. • Clear guidelines for accountability in AI development and deployment.
Job Displacement:	• AI and automation may replace certain jobs. • Strategies for workforce transition and retraining.
Security:	• AI systems can be vulnerable to hacking and malicious use. • Ensuring robust security measures are in place.
Ethical Use of AI:	• Ensuring AI is used for beneficial purposes and not for harm. • Guidelines and regulations for ethical AI practices.
AI in Decision-Making:	• AI systems used in critical areas like healthcare and criminal justice. • Importance of fairness and accuracy in AI-assisted decisions.
Long-Term Impact:	• Considering the long-term societal impacts of AI development. • Promoting sustainable and ethical AI advancements.
Global Collaboration:	• International cooperation on AI ethics and standards. • Sharing best practices and regulatory approaches

Challenges in AI

Data Quality and Availability:	• AI systems require large amounts of high-quality data. • Ensuring access to diverse and representative datasets.
Bias and Fairness:	• AI can inherit biases from the data it is trained on. • Addressing and mitigating biases to ensure fairness.
Transparency and Explainability:	• AI decision-making processes can be opaque and complex. • Developing explainable AI systems that users can understand and trust.
Ethical and Legal Issues:	• Navigating the ethical implications of AI applications. • Complying with existing laws and developing new regulations.
Privacy Concerns:	• Protecting personal data and ensuring user privacy. • Balancing data utilization with privacy rights.
Security Risks:	• AI systems can be vulnerable to hacking and malicious attacks. • Implementing robust security measures to protect AI infrastructure.
Scalability:	• Scaling AI solutions to handle real-world applications. • Managing computational and resource requirements.
Interdisciplinary Collaboration:	• Collaboration between AI developers, domain experts, and policymakers. • Integrating diverse perspectives to address complex challenges.
Human-AI Interaction:	• Designing AI systems that interact effectively and intuitively with humans. • Ensuring user-friendly and accessible AI interfaces.
Continuous Learning and Adaptation:	• AI systems need to continuously learn and adapt to changing environments. • Ensuring ongoing updates and improvements.

Understanding AI Bias

Concept of Bias

- AI bias refers to the systematic and repeatable errors in decision-making, caused by faulty assumptions, or skewed data. These biases can lead to unjust outcomes and discrimination, impacting individuals or groups negatively. Understanding and addressing bias in AI is crucial for building fair and trustworthy systems.

Ethical Considerations

- The implications of AI bias are far-reaching, affecting sectors such as finance, healthcare, and criminal justice. Biased AI can perpetuate stereotypes, reinforce social inequalities, and undermine public trust. It's imperative to recognize and rectify bias to ensure equitable and ethical AI applications.

Implications

- Ethical considerations in AI bias encompass the responsibility to safeguard against harm, uphold fairness, and promote transparency. Staying cognizant of the cultural, societal, and moral implications of AI bias is essential for creating systems that respect human dignity and human rights.

Examples of AI Bias

View the Dove AI Commercial: https://youtu.be/sD-R2OzcleQ

All images below were created using Adobe Firefly

Prompt: Generate an image of a beautiful woman

Prompt: Generate an image of normal average woman

Prompt: Generate an image of ethnic average woman

Combatting Bias in AI

Mitigation Strategies

Mitigating AI bias involves developing inclusive datasets, auditing algorithms, and employing fairness-aware machine learning techniques. Implementing diverse and inclusive teams, creating clear guidelines, and fostering transparency can help counteract bias in AI systems

Algorithmic Fairness

Ensuring algorithmic fairness entails continuous monitoring, evaluating potential harms, and redressing biases. Adhering to unbiased and accountable AI practices is crucial for building and deploying ethical and equitable AI technologies.

Misinformation

Political consultant behind AI-generated Biden robocalls faces $6 million fine and criminal charges

Scammers are using AI to impersonate your loved ones. Here's what to watch out for

The next time you get a call from a family member or friend in need, you might want to make sure it's not a robot first.

Spread and Impact

AI has accelerated the proliferation of misinformation, amplifying its reach, impact, and sophistication. Deep-fakes, disinformation campaigns, and algorithmic biases have contributed to the erosion of truth and the manipulation of public opinion. Addressing misinformation facilitated by AI demands strategic interventions and technological countermeasures.

WORLD NEWS

Election disinformation takes a big leap with AI being used to deceive worldwide

This image will symbolize the West for decades to come. They will not forgive and will not forget and those children (if they survive) will grow up angry, very angry.

AI Hallucinations

Phenomenon and Risks

AI-generated hallucinations, also known as 'overfitting' or 'adversarial attacks,' pose threats to the reliability and safety of AI models. These phenomena can lead to erroneous predictions, vulnerabilities to manipulation, and potential security breaches. Assessing and mitigating AI hallucinations is essential for enhancing the robustness and dependability of AI systems.

EXAMPLES OF AI HALLUCINATIONS

Lawyer Uses ChatGPT to Cite Made Up Legal Precedents

- **Hallucination or Error -** ChatGPT invented a number of court cases to be used as legal precedents in a legal brief Steven A. Schwartz submitted in a case. The judge tried to find the cited cases, but found they did not exist.
- **Consequence -** Schwartz, another lawyer, and his law firm were fined $5,000 by the court. As his legal team noted, “Mr. Schwartz and the Firm have already become the poster children for the perils of dabbling with new technology; their lesson has been learned.”

Amazon Sells Mushroom Foraging Guides with Errors

- **Hallucination or Error -** Amazon’s Kindle Direct Publishing sold likely AI-written guides to foraging for edible mushrooms. One e-book encouraged gathering and eating species that are protected by law. Another mushroom guide had instructions at odds with accepted best practices to identify mushrooms that are safe to eat.
- **Consequence -** Public embarrassment, weakened trust

Teacher falsely accuses entire class of using ChatGPT

- **Hallucination or Error -** A Texas A&M University-Commerce teacher gave his entire class a grade of "Incomplete" because when he asked ChatGPT if the students' final essays were AI-generated, the tool told him they all were, even though detecting such text is outside ChatGPT's abilities or intended use.
- **Consequence -** Public embarrassment, weakened trust

AI Safety and Regulation

Importance of AI Safety

- Ensuring AI systems operate safely and reliably.
- Preventing accidents and unintended consequences.

Regulatory Frameworks

- Development of comprehensive regulations for AI.
- Examples include GDPR in Europe and CCPA in California.

Ethical Guidelines

- Establishing ethical standards for AI development and deployment.
- Promoting fairness, transparency, and accountability.

Compliance and Oversight

- Ensuring AI systems comply with existing laws and regulations.
- Regular audits and assessments of AI systems.

Risk Assessment

- Identifying and evaluating potential risks associated with AI.
- Implementing strategies to mitigate these risks.

AI and IHS

Do not input government data into any external AI system (OpenAI, ChatGPT, Google Gemini, Meta LLaMa, Adobe Firefly, Dall-E etc.)

Do not access AI tools or AI chats from a government computer

Do not discuss or input patient or confidential information into any external AI system

Never put anything into an AI tool that you wouldn't want shared
Your data is used to continuously train AI systems

If you are unsure if you can use a particular tool… ASK

Review the guidance from OPM https://www.opm.gov/data/resources/ai-guidance/

Addressing AI Issues

Challenges	Solutions & Best Practices
Data Bias	Diverse and representative data collection, bias detection and correction algorithms
Explainability	Interpretable AI models, transparency in decision-making processes
Regulatory Compliance	Ethical AI frameworks, industry standards, and regulatory guidelines
Awareness & Training	AI bias awareness programs, education on ethical AI usage
Collaborative Efforts	Multi-stakeholder partnerships, interdisciplinary research, and knowledge sharing
Continuous Monitoring	Audit trails, impact assessments, and feedback mechanisms

*dis*Trust and Verify

Understand AI Limitations:

- **Not Infallible:** AI systems can make mistakes or be biased.
- **Data-Driven:** AI accuracy depends on the quality and diversity of the data it was trained on.

Cross-Check Information:

- **Multiple Sources:** Verify AI-provided information against reputable sources.
- **Human Expertise:** Consult experts or trusted professionals for validation.

Review Data Sources:

- **Transparency:** Check if the AI system provides information about its data sources.
- **Credibility:** Assess the reliability of the sources the AI uses for its conclusions.

Monitor for Bias:

- **Bias Detection:** Be aware of potential biases in AI outputs.
- **Diverse Perspectives:** Ensure that AI considers a wide range of viewpoints and data.

Use Critical Thinking:

- **Question Results:** Don't accept AI outputs at face value. Ask how and why the AI reached its conclusions.
- **Logic and Consistency:** Evaluate the logic and consistency of the information provided.

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Tools used to create this brief

The rough draft of this brief was completed entirely with AI. All content was then verified for accuracy. All images were created using AI prompts (outside of product logo's, product images, and screenshots).

ChatGPT – Content and Images

Adobe Firefly – Images

ChatGPT for PowerPoint – Content

Microsoft PowerPoint Designer – Slideshow layout and design, Smart objects and images

Microsoft CoPilot – Content

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