## What is Artificial Intelligence (AI)?
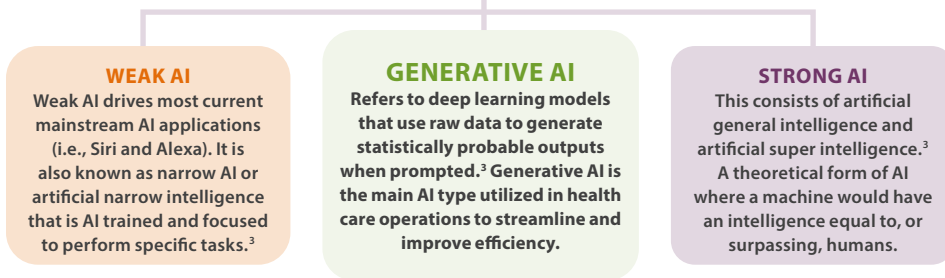
Artificial Intelligence (AI) is commonly defined as a technology that enables machines to simulate human intelligence and problem-solving.[1,2,3] Mimicking human autonomy allows AI systems to make predictions, recommendations, or decisions that influence real or virtual environments. AI systems learn from human-input data to conduct such activities, particularly automating tasks.[2] To mirror human-like behavior, AI utilizes technology techniques like machine learning (ML), deep learning, and natural language processing.

AI is a rapidly evolving tool, being the technology behind smart assistants like Siri and Alexa and Large Language Models like OpenAI's ChatGPT, but it also plays a significant role in revolutionizing health care, driving innovation, enhancing efficiency and accuracy, and ultimately improving better health outcomes.

### TYPES OF ARTIFICIAL INTELLIGENCE

**WEAK AI**
Weak AI drives most current mainstream AI applications (i.e., Siri and Alexa). It is also known as narrow AI or artificial narrow intelligence that is AI trained and focused to perform specific tasks.[3]

**GENERATIVE AI**
Refers to deep learning models that use raw data to generate statistically probable outputs when prompted.[3] Generative AI is the main AI type utilized in health care operations to streamline and improve efficiency.

**STRONG AI**
This consists of artificial general intelligence and artificial super intelligence.[3] A theoretical form of AI where a machine would have an intelligence equal to, or surpassing, humans.

## Why is AI Important to the Future of Health Care?

The history of AI in health care dates to early applications with medical diagnosis and medical imaging in the 1950's and has progressively, and rapidly, become integrated into medical practice and research.[4,5] (See ITUP's AI Policy Toolkit for an AI in health care timeline). California is currently facing an unprecedented health care workforce crisis, exacerbated by the fact that more Californians than ever now have insurance coverage. The onset of the COVID-19 pandemic further exacerbated the issue as there are not enough health workers to meet the needs of its increasingly diverse, growing, and aging population.[6] With rising health care costs due to increased demand for services, technological advancements, and an aging population that requires more complex care, AI holds promise to transform the health care delivery system by cutting costs and making it more efficient, personalized, and accessible for all Californians.

AI plays a crucial role in streamlining the health care delivery system. AI algorithms can analyze individual patient data to personalize treatments and interventions, provide patients with quick answers to basic health questions, and assist providers by scribing appointment notes. Additionally, AI automates administrative tasks, such as scheduling appointments, improving efficiency across the health care system.[7,8] AI has the potential to enhance and promote health equity for all Californians, but especially for vulnerable and marginalized communities in California.[9,10] Telehealth platforms and AI-powered diagnostics can improve access to health care services, especially in underserved or remote areas where health care infrastructure is limited, thus bridging the gap in health care access and reducing health disparities.[11,12] AI also contributes to early disease detection and predictive analytics, identifying at-risk populations and potentially reducing the burden and disparities in chronic diseases. By doing so, AI plays a vital role in managing population health more effectively.[13]

## USE CASES FOR AI IN HEALTH CARE
### Top 12 AI Applications in Health Care

- **Cancer Research**
- **Medical Diagnosis** (Radiology Reads)
- **Drug Development**
- **Rare Disease Diagnostics and Treatment**
- **Cybersecurity**
- **Fraud Detection**
- **AI Robot-Assisted Surgery**
- **Clinical Trials**
- **Administrative Tasks** (Patient Demographics Collection, Data Analytics, Scheduling Appointments)
- **Managing Health Care Data** (Automation)
- **Personalize Health Care Plans**
- **Medical Imaging**

## Setting the Context for AI Health Policy in California

### FEDERAL AND STATE POLICIES AND REGULATIONS OF AI IN HEALTH

#### *United States Department of Health and Human Services (HHS)*

The HHS is the federal agency tasked with enhancing the health and well-being of all Americans, by providing effective health and human services and by fostering sound, sustained advances in the sciences underlying medicine, public health, and social services. The HHS established an AI Office in March 2021, and the HHS Office of the Chief Artificial Intelligence Officer (OCAIO) facilitates effective collaboration on AI efforts across HHS agencies and offices.[14] The primary functions of the OCAIO are to drive implementation of the HHS AI strategy, stand up the HHS AI governance structure, coordinate the HHS response to AI-related federal mandates, and foster collaboration across HHS agencies and offices.

#### *The Office of Management and Budget (OMB)*

The OMB oversees the implementation of the President of the United State's vision across the Executive Branch, assisting in meeting policy, budget, management, and regulatory objectives. The OMB issued the first government-wide policy to mitigate risks associated with AI and maximize its benefits. This policy seeks to establish a framework that enables federal agencies to harness the benefits of AI while addressing potential risks and ensuring ethical considerations are integrated into AI initiatives across the government.

#### *The Office of Science and Technology Policy (OSTP)*

The OSTP is a department of the United States government with a broad mandate to advise the President and others within the Executive Office of the President on the effects of science and technology on domestic and international affairs.[15] The OSTP also has authority to lead interagency efforts to develop and implement sound science and technology policies and budgets. The OSTP issued a Blueprint for an AI Bill of Rights emphasizing the ethical principles, human rights, and societal values in shaping the future development and deployment of AI technologies, including protections against algorithmic discrimination.

#### *Covered California*

Covered California is the state's health insurance marketplace where Californians can find affordable, high-quality insurance from top insurance companies. Covered California leverages Google Cloud's AI solution, Document AI, to help streamline and validate health care eligibility. This AI-powered solution uses ML to automate the repetitive task of verifying resident information, improving speed and accuracy of data extraction, and gaining insights for data-driven decision making.[16]

#### *California State Senate*

California lawmakers have continued to set the stage in advancing new measures on AI aimed at protecting consumers and jobs in the second year of the 2023-2024 legislative session. Many bills include language and rules to prevent AI tools from discriminating in housing and health care services, as well as aiming to protect intellectual property and jobs. For example, SB 1047 by Senator Scott Weiner (D-San Francisco) aims to ensure the safe development of large-scale artificial intelligence systems by establishing clear, predictable, common-sense safety standards for developers of the largest and most powerful AI systems. Similarly, SB 892 by Senator Alex Padilla (D-Los Angeles) requires the California Department of Technology (CDT) to develop and adopt regulations to create an AI risk management system based on several relevant federal publications. See ITUP's 2024 Introduced Legislation Blog for more information on AI bills for the 2023-2024 legislative session.

## Healthy Skepticism Towards AI and its Impact on Access to Care

Although AI offers promising prospects of wider health care access and succinct, modernized operations, AI is nevertheless a new, evolving domain that requires further research on its concerns and true impact on health care delivery.[8] AI algorithms are reliant on **inputted data** for training, and biased data can be inherited by AI health algorithms, perpetuating and further exacerbating health disparities and hindering access to health services if not properly addressed, especially for vulnerable and marginalized communities.[19,20,21] Ensuring diverse, representative, and wholistic datasets is crucial to developing AI systems that work effectively across different populations. While AI has the potential to improve health care access, deployment of AI technologies must consider **affordability and accessibility** for users, especially in disadvantaged communities where access to technology and **digital literacy** may be limited. In addition, there are ethical considerations such as **patient privacy**, informed consent, and the responsible use of sensitive health data.[20] **Safeguards** must be established to protect patient rights and prevent the misuse of AI technologies.

**200** MILLION people are affected by algorithmic bias [17]

**60%** of people would be uncomfortable solely relying on AI for health care treatment [18]

**AFFORDABILITY**

**DIGITAL LITERACY**

**INPUTTED DATA**

**PATIENT PRIVACY**

**SAFEGUARDS**

AI can play a pivotal role in promoting health equity, however, careful consideration of ethical, social, and regulatory factors is essential to maximize the positive impact of AI on health equity while mitigating the potential risks and challenges.

## Policy Considerations for Equitable, Race Conscious AI Deployment in Health Care

- **What governance oversight must be created to ensure that AI usage does not exacerbate existing structural and racial inequities?**
- **What state departments should be responsible for AI governance and oversight? Which stakeholders should be included to develop the foundation for equity centered AI usage?**
- **How do we ensure effective, transparent communication across various partnerships to guarantee accountability in AI systems?**
- **What are the next steps to address racial and socioeconomic biases in AI algorithms to help bridge existing gaps in health disparities?**
- **How can advocates and stakeholders in AI health care ensure that AI systems are intentionally people-centered, prioritizing patients' needs and well-being?**
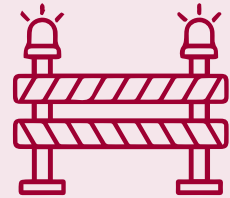
### Key Terms

**Algorithm**: The "brains" of an AI system. Algorithms drive the actions of AI systems and enable them to process data and make decisions.[22]

**Algorithmic Bias**: Occurs when automated systems contribute to unjustified different treatment or impacts disfavoring people based on their race, color, ethnicity, or any other classification protected by law.[23]

**Artificial Intelligence (AI)**: Machine-based technology that enables computer systems to perform tasks normally requiring human intelligence, i.e., recognizing patterns, learning from experience, drawing conclusions, making predictions, etc.[1,2,3]

- **Generative Artificial Intelligence (GenAI)**: Deep learning models that use raw data to generate statistically probable outputs when prompted.[3]
- **Strong AI**: A theoretical form of AI where a machine would have an intelligence equal to, or surpassing, humans.[3]
- **Weak AI**: AI trained and focused to perform specific tasks. Weak AI drives most current, mainstream AI applications (think Siri and Alexa).[3]

**Data Privacy**: The principle that a person should hold autonomy over their personal data. In organizations, data privacy secures people's personal identifiable information and protected health information, including the ability to decide how organizations collect, store and use their own data.[24]

**Deep Learning (DL)**: A subset of machine learning that focuses on mirroring humans' neural networks. Involves algorithms and artificial neural networks processing large amounts of data to then automatically extract patterns from such complex data.[22]

**Large Language Models (LLMs)**: Advanced algorithms designed to process, generate and discern human language and behavior on a vast scale. LLMs are trained on large amounts of data from various sources, enabling them to generate content at a sophisticated level (think ChatGPT and Gemini).[25]

**Machine Learning (ML)**: A subdiscipline of AI; the use of computer systems and algorithmic data to learn and perform complex tasks without human intervention or explicit directions.[22]

**Natural Language Processing (NLP)**: A subfield within AI that focuses on the interaction between computers and humans through natural language. NLP is a key component of LLMs' ability to interpret human language.[22]

**Responsible AI**: A set of guiding principles and regulations that help the design, development, and deployment of ethical and trustworthy AI applications for organizations and their stakeholders.[26]

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