



Artificial Intelligence Institute  
for Gastroenterology

# Introduction to Artificial Intelligence for Gastroenterologists

## Module 1: What is AI?

Welcome to Intro to AI, a mini course designed to help gastroenterologists gain a foundational understanding of artificial intelligence. Over the next eight modules, we'll explore the basics of AI, its practical uses, and its transformative potential in medicine and beyond.

Through insights from leading experts and curated resources, this series will give you a structured introduction to the evolving landscape of AI. Module One concentrates on the fundamentals—key terms and concepts that will lay the groundwork for understanding the technology behind AI and its applications in healthcare and gastroenterology.

## Understanding AI

### A Brief History

Artificial intelligence (AI) refers to a set of technologies that enable computers to perform tasks that typically require human intelligence. Tasks include recognizing images, understanding speech, and answering questions. Though it has roots dating back to the 1950s, AI only recently evolved into a powerful tool, thanks to advances in data storage and computational power.

From early experimental phases to breakthroughs in deep learning, AI now plays a role in everything from driving autonomous cars to creating sophisticated image analyses. These advancements paved the way for tools like recommendation algorithms, voice assistants, and today's large generative AI models.

### Key Concepts in AI

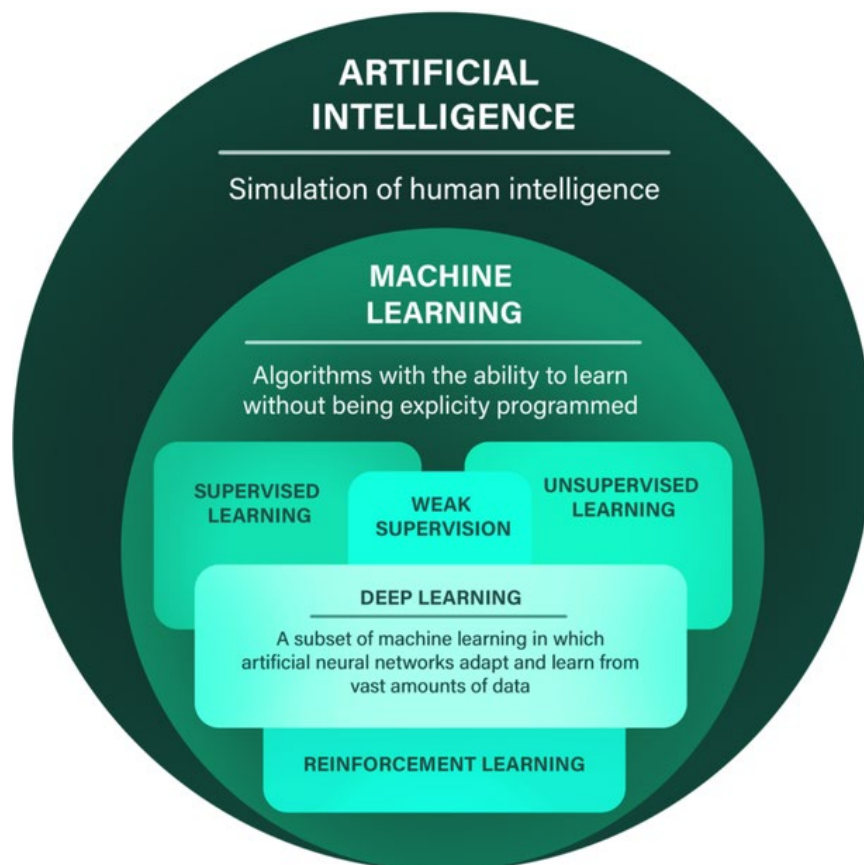
Understanding these core concepts will help you navigate the broader conversations and developments in AI.

## Neural Networks

Neural networks are the computational structures upon which modern AI, particularly deep learning, is built. Inspired by the human brain, neural networks use layers of artificial “neurons” that process and analyze input data to recognize patterns. After training on large datasets, these networks become capable of accurate pattern recognition, such as identifying polyps in endoscopic images.

## Machine Learning

Machine learning enables computers to find patterns in data, whether it’s numerical, textual, or visual. By “learning” from data, these algorithms can predict outcomes, personalize recommendations, and even assist in diagnostic decisions. For instance, machine learning powers the recommendation algorithms on Netflix, Spotify, and now in healthcare systems for risk assessment and patient management.



## **Deep Learning**

A subset of machine learning, deep learning leverages vast datasets and complex neural networks to identify patterns in data. Its ability to handle nuanced patterns has driven many recent AI advancements, including applications in endoscopic imaging and patient data analysis.

## **Generative AI**

Generative AI refers to algorithms that create new content, like images, text, or audio. This is the technology behind models like ChatGPT and DALL-E, which generate text or images based on prompts. It has transformative potential in medicine, where it is being explored for applications like drug discovery and data analysis.

## **Large Language Models (LLMs)**

Large language models (LLMs) are a type of generative AI trained on extensive text data to understand and generate human-like language. ChatGPT is an example, producing contextually relevant responses for tasks like answering questions, summarizing information, and even medical exam prep.

## **Multimodal AI**

Multimodal AI systems process and respond to different types of data (like text, images, and audio). This technology allows AI systems to interact across multiple formats, enabling applications that integrate clinical images, patient records, and more into a unified interface.

## **Alignment**

Alignment focuses on ensuring that AI systems act in accordance with user intentions and ethical guidelines. This is crucial in healthcare, where AI must adhere to clinical standards and patient safety protocols.

## **What's Next?**

Module Two, will cover “How Does AI Learn? Understanding Machine Learning and Deep Learning.” Over the coming weeks, we'll also cover more modules to improve

your AI literacy and consider the impact of AI on healthcare. We'll conclude with a look at evolving AI regulations and their implications for healthcare providers.

Right—let's get started! AI is here, and its potential to transform gastroenterology and patient care is only beginning to be realized.