HEALTH MANAGEMENT
TheAcademy

AI Bootcamp Glossary

Key Terms are Highlighted in Orange

Foundational AI Terms

In order to understand AI applications and how they apply to organizational processes, it's first important to develop an understanding of what exactly Artificial Intelligence (AI) is and what defines something as AI. Here are some of the most important terms to know.

AI Governance
The practices and policies organizations put in place to ensure the responsible development, deployment, and monitoring of AI systems, addressing issues such as ethics, privacy, security, and accountability.

Agentic AI
A type of artificial intelligence (AI) that can make decisions and take actions without human intervention. It differs from Generative AI in terms of the type of output: Generative AI is about producing something new, while Agentic AI is about achieving something specific. Early-stage agentic AI examples include things like autonomous vehicles, virtual assistants, and copilots with task-oriented goals.

Artificial Intelligence (AI)
The simulation of human intelligence processes by machines, especially computer systems.

Augmented Intelligence
The use of AI to enhance and support human decision-making and capabilities, rather than replacing human involvement entirely.

Automation
The use of technology to perform tasks where human input is minimized.

Conversational AI
A type of artificial intelligence (AI) that can simulate human conversation. It is made possible by natural language processing (NLP), a field of AI that allows computers to understand and process human language.

ChatGPT
A widely known chatbot based on a large language model, capable of engaging in conversational interactions and assisting with a variety of tasks.

Deep Learning
A subset of machine learning, composed of three or more hidden layers of neural networks. It is modeled on the way the human brain operates and can process significantly more data than traditional machine learning.

Deterministic Artificial Intelligence Systems
Follow human-defined rules and algorithms and behave in predictable ways. They are usually rules-based or programmed and have well-defined outcomes.

Foundation Model
Very large deep learning neural networks (millions to trillions of parameters) that serve as a basis for the development of advanced machine learning models. They are much more adaptable than traditional machine learning models and can perform a far greater diversity of tasks.

Generative AI
Deep learning algorithms that can create audiovisual media and extensive text output in response to submitted user prompts. In the context of Natural Language Processing (NLP), generative AI models can understand and generate human-like text.

Intelligent Automation (IA)
The process of using artificial intelligence (AI) to make self-improving software automation. Intelligent automation uses machine learning (ML) and other cognitive technologies to continuously collect, process, and analyze data. As such, it learns from experience.

Large Language Models (LLMs)
A category of foundation models trained on immense amounts of data making them capable of understanding and generating natural language and other types of content to perform a wide range of tasks.

Machine Learning (ML)
A branch of artificial intelligence that studies how machines can imitate the way humans learn to improve their perception, knowledge, thinking, or actions based on experience or data.

Natural Language Processing (NLP)
A branch of computer science that converts unstructured language data into a structured format, allowing machines to emulate human cognition of text and spoken words. In practice, NLP combines rule-based models of human language (computational linguistics) with statistics and machine learning.

Probabilistic Artificial Intelligence Systems
Learn from experience, aiming to learn patterns from data and make predictions on new, unseen data. It uses the effect of random occurrences or actions to forecast the possibility of future results.

Robotic Process Automation (RPA)
Also known as software robotics, uses automation technologies to mimic back-office tasks of human workers, such as extracting data, filling in forms, moving files, et cetera. It is rules-based and process driven, meaning that it does not learn from experience.

Data Terms

Now that you have a better understanding of foundational AI terms, it's useful to know what information AI systems draw their decision-making from. There are a number of different types of data and the ways in which they are organized in AI databases. AI systems are only as reliable as the data provided to them!

Big Data

Refers to extremely large and diverse collections of structured, unstructured, and semi-structured data that continues to grow exponentially over time. These datasets are so huge and complex in volume, velocity, and variety, that traditional data management systems cannot store, process, and analyze them.

Structured Data

Typically categorized as quantitative data and is highly organized. Structured data is information that can be organized in rows and columns.

Unstructured Data

Typically categorized as qualitative data. It cannot be processed and analyzed by conventional data tools and methods. Unstructured data lacks any built-in organization or structure. Examples include images, texts, customer comments, medical records, and even song lyrics. 80% of worlds data is unstructured.

Semi-Structured Data

The "bridge" between structured and unstructured data. It doesn't have a predefined data model. It combines features of both structured data and unstructured data. An example of semi-structured data is a video on a social media site. The video by itself is unstructured data, but a video typically has text for the internet to easily categorize that information, such as through a hashtag to identify a location.

Data Labeling

In machine learning, it is the process of identifying raw data (images, text files, videos, etc.) and adding one or more meaningful and informative labels to provide context so that a machine learning model can learn from it.

Data Mining

The process of extracting useful information from a vast amount of data. It's used to discover new, accurate, and useful patterns in the data, looking for meaning and relevant information for the organization or individual who needs it.

Recommender System

Filtering data by pertinence.

Reinforcement Learning

A machine learning model similar to supervised learning, but the algorithm isn't trained using sample data; model learns as it goes by using trial and error and sequence of successful outcomes is reinforced to develop the best recommendation for a given problem.

Supervised Learning

Sorting by learned patterns.

Transfer Learning

Applying analytical methods from one use-case to another.

Unsupervised Learning

Detecting new patterns.

Image Processing

The process of transforming an image into a digital form and performing certain operations to get some useful information from it. Medical image processing research involves developing algorithms and software that permit automatically or semi-automatically extracting critical information from medical image datasets.

Predictive Analytics

The use of data to predict future trends and events. It uses historical data – combined with statistical modeling, data mining techniques, and/or machine learning – to forecast potential scenarios that can help drive strategic decisions.

Classification Model

Classification involves predicting discrete categories or classes.

Regression Model

Regression involves predicting continuous, real-value quantities.

Speech Recognition

A capability which enables a program to process human speech into a written format.

AI Training Terms

AI models don't just make decisions based on data alone. How these systems are trained to use this data is also a very important aspect of AI proficiency and reliability. Here are a few terms to know that apply to AI training.

AI Algorithm
A set of instructions to be followed in calculations or other operations. This applies to both mathematics and computer science. So, at the essential level, an AI algorithm is the programming that tells the computer how to learn to operate on its own.

AI Model
A program that has been trained on a set of data to recognize certain patterns or make certain decisions without further human intervention.

Expert System
A machine which uses a rules-based knowledge base to solve problems by emulating human-expert decision-making processes.

Fine Tuning
The process of making small adjustments to achieve the desired output or performance. In deep learning, it involves the use of weights of a trained neural network to program another deep learning algorithm from the same domain.

Inference/Rules Engine
A component of an AI system that is responsible for drawing conclusions from a set of data. It applies rules to the data-input in order to make deductions/ predictions based on the information it has been given.

Knowledge Base
The set of expert-defined rules that are used to problem-solve.

Training Data
The data you use to train an algorithm or machine learning model to predict the outcome you design your model to predict.

Parameter
An internal variable used by an AI model to help make predictions or decisions. When a model is 'trained,' the 'weight' of each parameter is adjusted to minimize the difference between predictions and actual values.

Rules Based Knowledge
Knowledge in the form of an 'if, then' output.

User Interface (UI)
The point of human-machine interaction in a device.

AI Risk/Risk Mitigation Terms

While AI applications show a lot of promise, they do not come without any significant risks. This not only applies to security, but dependability and information accuracy as well. Here are a few terms that deal with AI risk that you MUST be aware of.

AI Alignment
A field of AI safety research that aims to ensure artificial intelligence systems achieve desired outcomes and keep working for humans, no matter how powerful the technology becomes.

AI Bias
The phenomenon where AI systems exhibit discriminatory or unfair behavior due to biases present in their training data, algorithms, or human designers.

AI Hallucination
A phenomenon where a large language model (LLM) perceives patterns or objects that are nonexistent creating outputs that are nonsensical or inaccurate. These errors can be caused by a variety of factors, including insufficient training data, incorrect assumptions made by the model, or biases in the data used to train the model.

AI Misalignment
The emergence of new capabilities that diverge from the stated goals of the AI system they are derived from.

Black Box Problem
The lack of transparency in some AI models, where the internal decision-making processes are complex and difficult for humans to interpret or explain.

Cybersecurity
Existing safeguards need to be updated to reflect the enhanced capabilities that AI offers to external actors seeking to compromise healthcare IT systems.

Data Drift
A phenomenon in which a large language model (LLM)'s performance worsens over time due to changes in the statistical properties of data that was initially used to train it. In other words, LLM's can become less accurate as new variations begin to arise in the data that is presented to it.

Data Transparency
Making information about data collection, processing, and usage easily accessible and understandable by providing clear and concise information about how data is handled, who has access to it, and what it's being used for.

Deepfake

A type of AI used to create convincing images, audio, and video fakes, describes both the technology and the resulting phony content.

Explainability

Enables human users to comprehend and trust the results and output created by machine learning algorithms.

Instrumental Convergence

Also known as convergent instrumental values, is the theorized tendency for most sufficiently intelligent agents to pursue potentially unbounded instrumental goals.

Jailbreaking

A form of hacking that aims to bypass an AI model's ethical safeguards to elicit prohibited information that generative AI content filters would otherwise block