AI Glossary for Staff and Students

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Welcome to the AI Glossary for Staff and Students

Artificial Intelligence (AI) is transforming education and research, offering new tools and capabilities across various fields. This glossary provides clear definitions for essential AI terms, from machine learning and neural networks to ethical AI practices, helping you navigate and make the most of these evolving technologies. Whether you're a beginner or looking to deepen your understanding, this glossary is designed to support your learning, encourage responsible use, and help you leverage AI effectively in both academic and administrative contexts.

A	B	C	D	E	F	G
H	I	L	M	N	O	P
R	S	T	V	W	Z	

A

Algorithm

An algorithm is a set of step-by-step instructions that a computer follows to solve a specific problem or perform a task. In the context of artificial intelligence and machine learning, algorithms are used to process data, make decisions, and generate predictions.

Anthropomorphism

This refers to when humans attribute human-like characteristics to non-human objects. In AI, this means perceiving a chatbot or virtual assistant as more aware, emotional, or even sentient than it truly is - such as believing it feels happy, sad, or conscious.

Application Programming Interface (API)

An Application Programming Interface (API) is a set of rules and tools that allows different software applications to communicate with each other.

Artificial General Intelligence (AGI)

A hypothetical form of AI that could understand, learn, and apply knowledge across diverse tasks at a human-like level. Unlike current AI, which is specialised, AGI would adapt to new tasks without specific programming. AGI does not yet exist and remains an area of ongoing research.

Artificial Intelligence (AI)

Artificial Intelligence (AI) is the ability of machines or computer systems to perform tasks that usually require human intelligence, such as recognising speech, making decisions, solving problems, or learning from experience.

Autoencoders

An Autoencoder is a neural network that compresses data into a smaller representation and then reconstructs it.

Automated Speech Recognition

ASR is a type of natural language processing that focuses on converting spoken language into text, enabling technologies like voice assistants to understand and respond to human speech.

Azure

Microsoft Azure is a cloud computing platform offering services like application hosting, data analytics, AI tools, and storage, enabling organisations to build, deploy, and manage solutions across cloud and hybrid environments.

B

Bias in AI

Bias in AI refers to the tendency of artificial intelligence systems to produce unfair or prejudiced results due to the data they are trained on or the way they are designed. Addressing bias in AI is important to ensure fairness, accuracy, and inclusivity in its applications.

Big Data

Big Data refers to extremely large and complex datasets that cannot be easily processed using traditional methods. It comes from various sources, such as social media and sensors.

C

Chatbot

A chatbot in AI is a software application that uses artificial intelligence to simulate human-like conversations. It interacts with users via text or voice, providing information, answering questions, or assisting with tasks in real-time.

ChatGPT

ChatGPT is an AI language model developed by OpenAI that can understand and generate human-like text. It's designed to assist with various tasks like answering questions, writing content, and engaging in conversations, making it useful for everything from casual chats to more complex problem-solving.

Claude

Claude is an AI chatbot developed by Anthropic, designed to assist with a range of tasks such as answering questions, providing recommendations, and generating content.

Cognitive computing

Cognitive Computing is a technology that mimics human thought processes by using artificial intelligence to analyse data, learn from patterns, and make decisions, often applied to tasks like language understanding, decision-making, and problem-solving.

C (continued)

Computerised Learning

Computerised Learning in relation to AI refers to the use of artificial intelligence technologies to enhance or automate the learning process. It involves AI-driven tools like adaptive learning platforms, intelligent tutoring systems, and personalised educational programs that adjust content based on a learner's progress and needs.

Computer vision

Computer Vision is a field of artificial intelligence that enables computers to interpret and understand visual information from the world, such as images and videos, to perform tasks like object recognition, image analysis, and facial detection.

Conversational AI

A sub-field of AI that refers to technologies, such as chatbots or virtual assistants or agents, that users can talk to. For example, a chatbot can understand and respond to customer inquiries in a natural and human-like manner.

CoPilot

See **GitHub Copilot** and **Microsoft or MS Copilot.**

D

Data Augmentation

Data augmentation uses existing data to generate new, diverse samples, which helps enhance a model's optimisation and generalisability. By increasing the dataset size, data augmentation allows models to perform better on new, unseen data.

Data Mining

Data Mining is the process of discovering patterns, trends, and useful information from large sets of data. It involves analysing and extracting valuable insights from data, often using techniques from statistics and machine learning.

Deep Learning

Deep Learning is a type of AI that teaches computers to learn from a large amount of data. It uses layers of artificial "neurons" to recognize patterns in things like pictures, sounds, or text. The more data it has, the better it becomes at tasks such as identifying objects in images or understanding speech.

AI Detector/Detection

This is a tool designed to identify whether something was created using generative AI tools. While these tools are not completely reliable, they can provide an indication of how likely it is that a given text is AI-generated.

D (continued)

Diffusion Models

A type of AI model that creates data like images by starting with random noise (like static on a TV) and slowly removing the noise to form a clear picture. It's used to generate new and realistic data, such as artwork or photos.

Distortions

AI Distortions refer to errors, biases, or inaccuracies in AI systems that lead to skewed or unfair outcomes. These distortions can arise from biassed data, flawed algorithms, or improper system design, causing the AI to make incorrect or prejudiced decisions.

E

Emergence/Emergent Behaviour

This refers to advanced artificial intelligence systems that exhibit capabilities or behaviours that were not explicitly programmed or anticipated during their development. These behaviours emerge from complex interactions within the system, often as a result of training on large datasets.

Environmental Impact

Environmental impact in the context of AI refers to the effects that developing, deploying, and maintaining artificial intelligence systems have on the environment. This includes energy consumption, carbon emissions from data centres, and the resource-intensive processes required for training large AI models, highlighting the need for sustainable practices in AI.

Ethics

AI Ethics refers to the principles and guidelines that govern the development and use of artificial intelligence to ensure that it is fair, transparent, and does not cause harm. It addresses issues like bias, privacy, accountability, and the societal impact of AI.

F

Fine Tuning

The process of taking a pre-trained AI model and making small adjustments so it works better for a specific task.

Foundation Models

Large AI models trained on a wide range of data, making them capable of understanding and performing many tasks. They serve as a base for other, more specific AI applications, like chatbots or language translators, by fine-tuning them for particular tasks.

G

Generative Adversarial Network (GAN)

A type of AI model with two parts: one creates new data (like images), and the other checks if it looks real or fake. They work against each other, improving over time until the generated data looks real. GANs are often used to create realistic images, videos, or music.

Generative AI (GenAI)

Generative AI (GenAI) refers to artificial intelligence systems designed to create new content, such as text, images, or music, based on patterns learned from existing data. Unlike traditional AI that only analyses or classifies data, Generative AI generates original outputs.

GitHub Copilot

An AI-powered coding assistant embedded within development environments, designed to help developers with tasks like writing, completing, and refactoring code, enhancing productivity through intelligent code suggestions and support.

GPT

GPT stands for Generative Pre Trained Transformer. It is a type of artificial intelligence model developed by OpenAI that is designed to understand and generate human-like text based on the input it receives.

G (continued)

AI Governance

Refers to the frameworks, policies, and practices established to oversee the development, deployment, and use of artificial intelligence systems. Its purpose is to ensure that AI is used responsibly, ethically, and safely, minimising risks and promoting transparency, accountability, and fairness in AI applications.

H

Hallucinations

AI Hallucinations occur when an AI generates incorrect or made-up information that sounds believable. This happens because the AI predicts patterns without truly understanding or verifying facts, leading to confident but false responses.

I

Image Recognition

Image recognition in AI is the ability of machines to identify and classify objects or features in images using deep learning algorithms. It's used in applications like facial recognition and object detection.

L

Large Language Model (LLM)

Large Language Model (LLM) is a type of artificial intelligence that is trained on vast amounts of text data to understand and generate human language. LLMs can perform various tasks, such as answering questions, writing essays, translating languages, and creating conversational responses.

M

Machine Learning

Machine Learning is a branch of artificial intelligence that enables computers to learn from data and improve their performance on tasks without being explicitly programmed.

- ## Reinforcement Learning

  Reinforcement Learning is a type of machine learning where an AI learns to make decisions by interacting with an environment and receiving feedback in the form of rewards or penalties.

- ## Supervised Learning

  Supervised Learning is a type of machine learning where an AI model is trained on labelled data, meaning each training example includes the correct answer. The model learns to make predictions based on this data.

- ## Unsupervised Learning

  Unsupervised Learning is a type of machine learning where an AI model is trained on data without labelled answers. The model explores the data to find patterns or groupings on its own.

Microsoft Copilot

This is an AI-powered assistant embedded within Microsoft applications, designed to help users with tasks such as drafting, summarising, and analysing content, enhancing productivity through intelligent automation and support.

Multimodal

This is a subfield of machine learning focused on interpreting and integrating multiple types of data, such as text, images, and audio, to build models that can process and relate information from various sources.

N

Natural Language Processing (NLP)

Natural Language Processing (NLP) is a field of artificial intelligence that focuses on the interaction between computers and human language. It enables machines to understand, interpret, and respond to written or spoken language.

Neural Networks

Neural Networks are a type of artificial intelligence model inspired by the structure of the human brain. They consist of layers of interconnected nodes, or "neurons," that process information.

O

OpenAI

A leading AI research organisation that creates and promotes AI technologies, including tools like ChatGPT.

Optical Character Recognition (OCR)

This is the process of converting images of printed, handwritten, or typed text into a machine-readable text format. This technology allows computers to recognise and interpret text from images, making it easier to edit, search, and store information digitally.

Optimisation

AI optimisation involves improving the performance and efficiency of AI algorithms and models to achieve better results.

Overfitting

Occurs when a model is too complex. In machine learning, it happens when an algorithm fits too closely to its training data, resulting in a model that can't make predictions or conclusions.

P

AI Plugin

An AI plugin is a specialised software component that integrates artificial intelligence and machine learning capabilities into external applications and services. These plugins enable the automation of tasks, personalisation of user experiences, and optimisation of workflows by leveraging AI technologies.

Predictive analytics

The use of AI to analyse current and past data to make predictions about future events. It helps businesses and organisations anticipate trends or outcomes, such as predicting customer behaviour or sales trends.

Pre-training

Pre-training in AI refers to the initial phase of training a model on a large dataset before it is fine-tuned for specific tasks. During this, the model learns general patterns, language structures, and contextual relationships from the data, helping it to understand and generate text more effectively.

Prompt Engineering

Prompt Engineering is the skill of creating questions or instructions for AI to get the answers or responses you want. By carefully choosing the right words and structure, you help the AI understand what you're asking and produce better results. Also see **Single-shot prompting**, and **Zero-shot prompting**.

R

Recursive Prompting

Is a strategy for guiding AI models to produce better quality output. It works by giving the model a sequence of prompts or questions that build on its previous responses, gradually refining the context and the AI's understanding to achieve the desired outcome.

Responsible AI

Responsible AI refers to the development and use of artificial intelligence systems in an ethical, transparent, and accountable way. The aims of this are to ensure fairness, prevent biases, and safeguard privacy.

Robotics (Autonomous Robot)

A branch of technology that involves designing and creating robots that can perform tasks on their own without human control.

S

AI Safety

AI Safety is an interdisciplinary field that focuses on understanding the long-term effects of artificial intelligence and the potential risks of its rapid advancement. It seeks to find ways to ensure that AI systems are safe and beneficial for society.

Sentiment analysis

A method in AI that examines text (like reviews or social media posts) to determine the writer's feelings or opinions. It helps identify whether the sentiment is positive, negative, or neutral, allowing businesses to understand customer feedback and public opinion.

Single-shot prompting

Also known as One-shot prompting, this involves providing a model with a single example or prompt to understand a specific task and generate a response or prediction. This approach allows the model to learn from just one instance, enabling it to perform the desired task effectively without needing extensive training data.

S (continued)

Strong AI (also known as artificial general intelligence – AGI)

Refers to AI systems that possess generalised intelligence and capabilities on par with human cognition. Unlike narrow or weak AI, which is designed for specific tasks, strong AI aims to replicate human-like reasoning, learning, and problem-solving abilities across a wide range of activities.

Stochastic Parrot

Stochastic parrots are AI systems that use statistical relationships from massive datasets to generate human-like text, but they lack true semantic understanding behind the word patterns.

T

Token and Tokenisation

Tokenisation is a fundamental process in Natural Language Processing (NLP) and machine learning that involves breaking down text into smaller units called tokens. These tokens can be words, subwords, or even characters. The primary goal of tokenisation is to convert text into a format that computational models can more easily analyse and understand. For example, tokenising a sentence "I am ChatGPT" into the words: "I, "am", "Chat", "G", and "PT".

Training Data

Training Data refers to the dataset used to train an AI or machine learning model. The quality, size, and representativeness of the training data are crucial factors in the model's performance.

Turing Test

The Turing Test is an evaluation of a machine's ability to exhibit human-like intelligence. An AI passes the test if it can engage in a conversation with a human without the human realising they are talking to a machine.

V

Voice-cloning

A technology that uses AI to create a digital copy of a person's voice. It can replicate the tone, pitch, and speech patterns, allowing the AI to generate new speech that sounds like the original person.

Voice Processing

Voice processing in AI involves converting spoken language into text (speech-to-text) and then converting text back into spoken language (text-to-speech). This enables AI systems to comprehend and produce human speech, facilitating natural and efficient interactions between humans and machines.

W

Weak AI

Also known as narrow AI, this refers to artificial intelligence systems designed to perform specific tasks without general understanding or awareness. Examples include chatbots or recommendation systems.

Whisper

Is an AI system developed by OpenAI to perform automatic speech recognition (ASR), the task of transcribing spoken language into text. Whisper is trained on a large dataset of diverse audio, allowing it to effectively manage various accents, background noise and other audio variations.

Z

Zero-shot prompting

This is a technique that leverages the generalisation capabilities of LLMs to perform new tasks without any prior specific training or examples.

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We aim to keep this glossary list regularly updated and would appreciate your input on any terms you think should be included. Please email your suggestions to AI-Hub@qub.ac.uk.