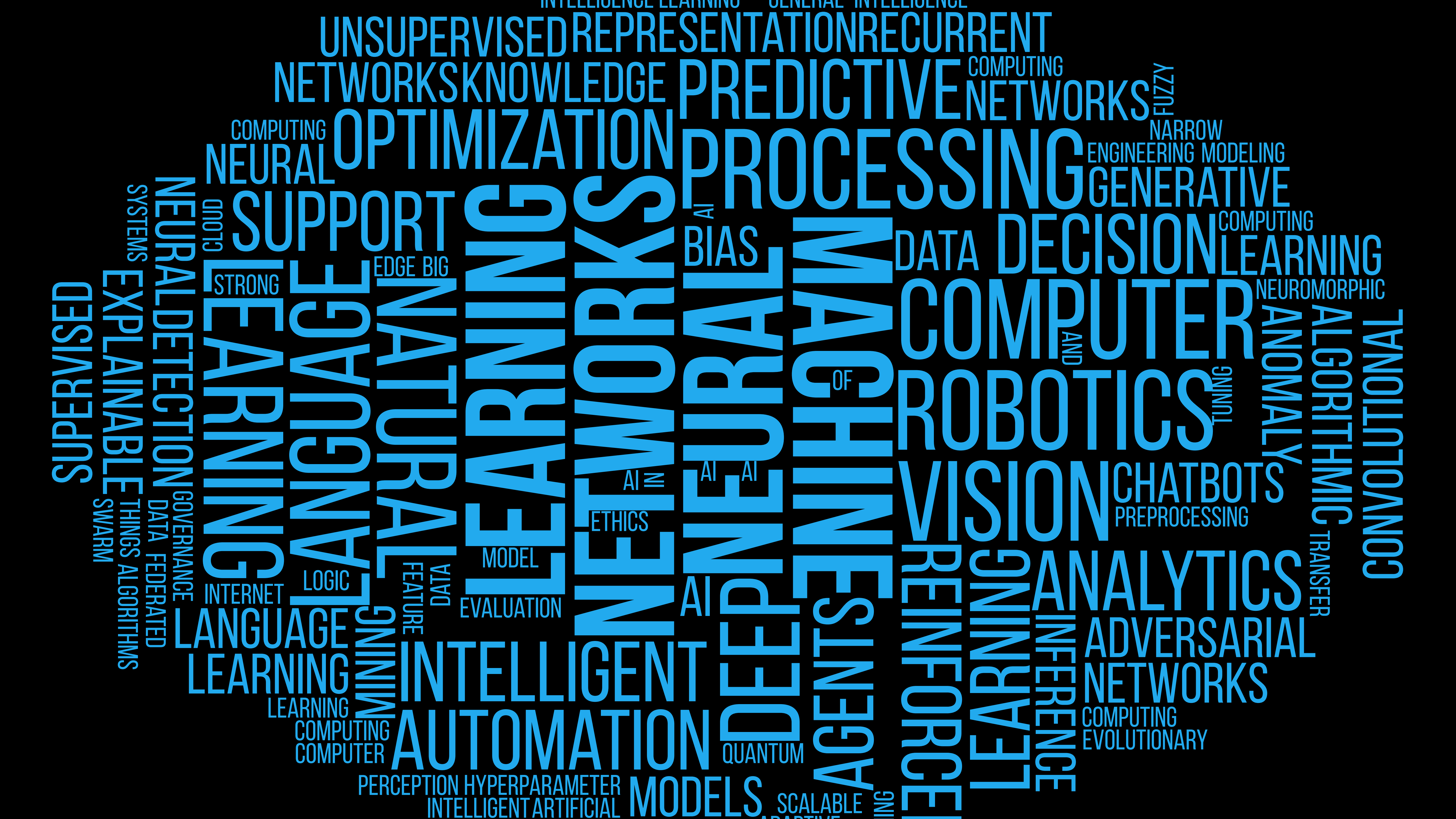
Understanding AI: Unpacking the buzzwords and why you need to adopt


UNSUPERVISED
REPRESENTATION
RECURRENT
NETWORKS
KNOWLEDGE
PREDICTIVE
COMPUTING
NETWORKS
FUZZY
COMPUTING
OPTIMIZATION
NEURAL
PROCESSING
NARROW
ENGINEERING
MODELING
GENERATIVE
SYSTEMS
NEURAL
CLOUD
SUPPORT
LEARNING
NETWORKS
NEURAL
MACHINE
AI
BIAS
DATA
DECISION
COMPUTING
LEARNING
SUPERVISED
EXPLAINABLE
DETECTION
STRONG
EDGE
BIG
LANGUAGE
NATURAL
NEUROMORPHIC
COMPUTER
AND
ROBOTICS
TUNING
ANOMALY
ALGORITHMIC
CONVOLUTIONAL
OF
VISION
CHATBOTS
PREPROCESSING
AI
IN
AI
AI
ETHICS
DEEP
SWARM
THINGS
ALGORITHMS
DATA
FEDERATED
GOVERNANCE
MODEL
AI
REINFORCEMENT
LEARNING
INFERENCE
ANALYTICS
TRANSFER
INTERNET
LOGIC
FEATURE
DATA
EVALUATION
AGENTS
ADVERSARIAL
LANGUAGE
MINING
INTELLIGENT
NETWORKS
LEARNING
ALGORITHMS
LEARNING
COMPUTING
COMPUTER
AUTOMATION
QUANTUM
COMPUTING
EVOLUTIONARY
PERCEPTION
HYPERPARAMETER
INTELLIGENT
ARTIFICIAL
MODELS
SCALABLE

Key Terms

- AI
- Gen AI
- Agentic AI
- LLM
- Tokens

What is AI?

- **Artificial Intelligence (AI)**
  The capability of machines to perform tasks that typically require human intelligence, such as learning, problem-solving, decision-making, and perception.

- **Machine Learning (ML)**
  A subset of AI that involves the use of algorithms and statistical models to enable systems to perform specific tasks effectively without being explicitly programmed.

- **Neural Networks**
  A system inspired by the human brain and nervous system, designed to recognize patterns and make decisions through a network of interconnected nodes.

- **Natural Language Processing (NLP)**
  The ability of machines to understand, interpret, and generate human language, enabling communication and interaction between humans and machines.

Generative AI

Defining Generative AI

AI systems capable of generating novel and creative content, such as text, images, audio, and video.

Capabilities of Generative AI

Generating realistic and unique content, completing tasks, and assisting in creative workflows.

Differentiating from Traditional AI

Generative AI focuses on creation and synthesis, while traditional AI systems excel at analysis and optimization.

Applications of Generative AI

Content creation, language generation, image synthesis, music composition, and personalized recommendations.

Generative AI is a transformative technology that is reshaping how we create, interact, and experience content. Understanding its capabilities and differences from traditional AI is crucial as these models continue to advance and integrate into various industries and applications.

Agentic AI: Autonomous Decision-Making

What is Agentic AI?

Agentic AI refers to autonomous AI systems that can make their own decisions and take actions without direct human supervision. These systems are imbued with the ability to perceive their environment, reason, and make judgments based on their own goals and objectives.

Key Characteristics of Agentic AI

Agentic AI systems exhibit traits such as self-governance, adaptability, and the capacity to learn and improve over time. They can navigate complex situations, identify optimal solutions, and execute tasks without the need for constant human intervention.

Use Cases in Education

In the education sector, Agentic AI can be leveraged to automate administrative tasks, personalize learning experiences, and provide intelligent tutoring systems. These systems can adapt to individual student needs, offering customized feedback, content, and pacing to enhance learning outcomes.

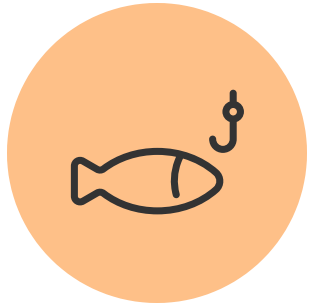
Ethical Considerations

As Agentic AI systems become more prevalent, it is crucial to address ethical concerns such as transparency, accountability, and the potential for bias. Educators must work closely with AI developers to ensure these systems are designed and deployed responsibly, respecting the privacy and wellbeing of students.

Large Language Models

What are Large Language Models?

Large Language Models (LLMs) are advanced artificial intelligence systems trained on vast amounts of text data to understand and generate human-like language.



Role in Generative AI

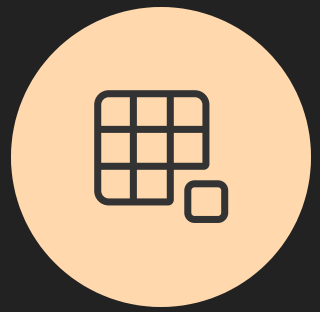
LLMs are a core component of Generative AI, enabling models to create human-like text, images, and other media outputs.

Key Examples

Examples of widely used LLMs include GPT-3, BERT, and T5, which have shown impressive language understanding and generation capabilities.

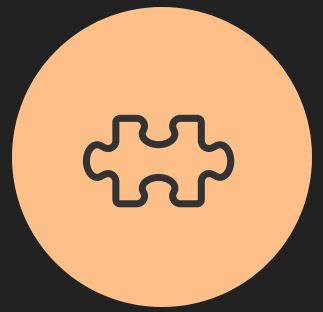
Large Language Models are a crucial part of the Generative AI ecosystem, demonstrating the incredible potential of artificial intelligence to understand and create human-like language. As these models continue to evolve, it's important to consider the ethical implications of their use and ensure they are developed and deployed responsibly.

Tokenization



Breaking down input

AI systems take the input (such as text, images, or audio) and break it down into smaller, more manageable units.



Identifying meaningful units

These smaller units, called tokens, represent the individual components or building blocks of the input, such as words, characters, or visual features.

Understanding the components

By tokenizing the input, the AI system can better understand the individual elements and their relationships within the overall input.

Tokenization is the crucial first step in how AI systems process and understand input, enabling them to then infer the appropriate output.

Inference

Machine Learning Models

AI systems use advanced machine learning algorithms to analyze and interpret the tokenized input.

Understanding the Task

The AI system leverages its knowledge and training to comprehend the specific task or problem it needs to solve.

Generating Outputs

Based on the tokenized input and its understanding of the task, the AI system generates the appropriate output or response.

The core of how AI works is the process of tokenization and inference. By breaking down the input into meaningful units and then using machine learning models to infer the desired output, AI systems can perform a wide range of tasks effectively.

Useful links

- **How does AI learn**
  https://www.youtube.com/watch?v=R9OHn5ZF4Uo
- **A bit more nuanced (neural networks)**
  https://www.youtube.com/watch?v=wvWpdrfoEv0
- **How to learn AI in 17 mins**
  https://www.youtube.com/watch?v=EWFFaKxsz_s
- **How does tokenisation work**
  https://medium.com/data-science-collective/the-invisible-building-blocks-of-ai-what-you-need-to-know-about-tokenization-acadd86a63ba

PROMPT FRAMEWORK for EDUCATORS: The FIVE "S" Model

AI for Education

SET THE SCENE

Provide the AI Chatbot context on what role, expertise and/or environment it should use to guide its output.
Ex: "You are an expert STEM instructional designer and teacher..."

BE SPECIFIC

Be specific in the instructions. Clearly define the task and provide details on what you would like included.
Ex: "Use the 5E model to create a 60-minute hands-on lesson..."

SIMPLIFY YOUR LANGUAGE

Use a conversational approach with simplified language that avoids unnecessary jargon.
Ex: "Create an engaging lesson plan that aligns with CCSS..."

STRUCTURE THE OUTPUT

Tell the Chatbot how to structure the output with specifics on format, audience and/or sections.
Ex: "Create a rubric for my students formatted as a table with directions..."

SHARE FEEDBACK

Provide feedback at all points in the conversation. Share specifics on what needs to be revised to meet your needs.
Ex: "Change the format from a table to a checklist..."

PROMPT FRAMEWORK for STUDENTS: The FIVE "S" Model

AI for Education

SET THE SCENE

Tell the chatbot what role you would like it to take, so it can provide you a better, more targeted answer.
Ex: "You are a Shakespeare expert and are great at helping HS students study..."

BE SPECIFIC

Be specific in your instructions. Clearly define what you want the Chatbot to do and provide important details.
Ex: "Create a list of five debate topics on recycling for a 9th grader..."

SIMPLIFY YOUR LANGUAGE

Chatbots work best when you use simple language, so don't go crazy building out complex prompts.
Ex: "Explain the Pythagorean Theorem to me like I'm a 5th grader..."

STRUCTURE THE OUTPUT

Tell the Chatbot how to structure it's answers. Chatbots can use bullets, format a chart, and even use emojis.
Ex: "Create a quiz with multiple choice and open-ended questions for me..."

SHARE FEEDBACK

Chatbots don't get it right the first time and can make mistakes. So provide feedback throughout your chat.
Ex: "Change the format of the quiz to a study guide and flashcards... "

aiforeducation.io