WEKA

GRAPHICAL GUIDE

The Essential AI Lexicon

Understanding How AI Is Powering the Future

The AI Race

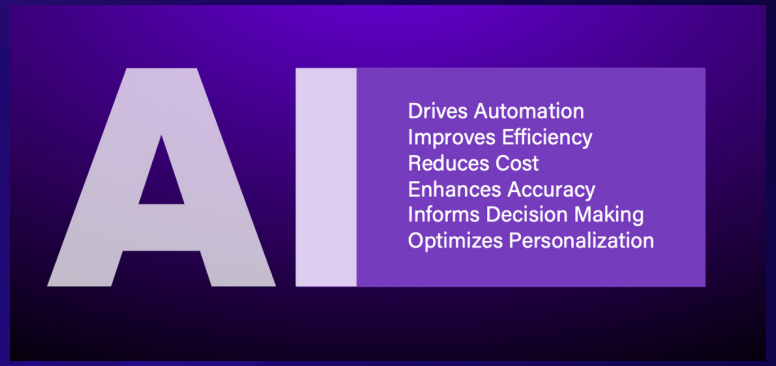
Has Only Just Begun

AI is taking the world by storm and transforming the way we do business and life. Some people are calling it a boom, a revolution, or even a golden age, and there doesn't seem to be a slowdown in sight. The broader AI market is experiencing meteoric growth and the Generative AI market is expected to top 1.3 trillion (with a "t") in revenue in the next decade. There is no denying that no matter what you call it, AI is changing the way we live, work, and do business.

Contents

...And for Good Reason

AI has the potential to enhance almost every aspect of humanity from how we schedule appointments or engage on social media to how we search for information, drive cars, and even manage our health and treat diseases. Whether it's making life more efficient, personalizing our experiences or medications, reducing costs, or driving automation in fields like manufacturing and retail, the impact of AI is growing daily.



Generative AI

In the Years To Come

10% & 50%

10% of all data and 50% of drug discovery and development initiatives will be from GenAI.[1]

2025

30%

Of manufacturers will use GenAI to enhance their product development effectiveness.

2027

$1.3T

Generative AI market is expected to top 1.3 trillion.[2]

2032

1 | https://www.altexsoft.com/blog/ai-drug-discovery-repurposing 2 | https://www.bloomberg.com/professional/insights/data/generative-ai-races-toward-1-3-trillion-in-revenue-by-2032

On Your Mark. Get Set. Let's Go!

The explosion of data supporting AI applications and the complex nature of AI data pipelines present challenges that are increasingly demanding a **paradigm shift** in the field of data management.

As AI continues to grow, the deployment of AI projects are becoming increasingly involved, and there is an ever-growing lexicon of AI terminology.

Conquering the complexities of launching a successful AI project requires an understanding of the key terms and concepts that are driving the AI explosion.

This graphical guide is designed to give you that foundation and provide an overview of frequently used AI terms. Discover how neural networks are created and learn some of the different types of deep learning algorithms. Understand the difference between foundation models and large language models, and discover why RAG is an important part of enhancing the performance of LLMs.

As AI continues to transform our world, we continue to observe that Generative AI is leading the pack. In this guide, you can also uncover some of the key ways that industries are applying GenAI to drive business outcomes.

Key Terms In AI

With the development of AI, a whole new lexicon has emerged. Understanding the components of an AI workflow are essential for determining your data management strategy.

START YOUR LEXICONS

01 AI Model

A computational framework that learns patterns from data and makes predictions or decisions based on the input data. We can think of this more simply as a software program.

02 Model Training

The process of creating a model by various algorithms to achieve a specific optimal performance. One way to think about this is that it is similar to building a software program.

03 Inferencing

The process of using an AI Model to make predictions on new unseen data. This can be described as running a large, more sophisticated software program.

04 Machine Learning

A subset of AI that uses algorithms trained on large data sets to enable computers to learn from data. This data-driven approach allows models to make predictions. While machine learning algorithms are able to train models on patterns and relationships from data, the algorithms can also adapt and improve their predictions based on experience. Examples of machine learning algorithms include k-nearest neighbors, naive Bayes, and gradient boosting algorithms like XGBoost and LightGBM.

05 Supervised Learning

Training a model on a known dataset, with scripted outcomes based on labeled inputs. With supervised learning, an algorithm can make predictions with new data beyond the training data set. Supervised learning is used for credit scoring, email filtering, and voice recognition.

06 Unsupervised Learning

An algorithm must determine an answer by analyzing data, patterns, and relationships. As its name suggests, unsupervised learning does not require supervision while training. This method is ideal for discovering new patterns across an unstructured dataset, and it's used for recommender systems, social network analysis, customer segmentation, anomaly detection.

07 Reinforcement Learning

An algorithm receives feedback based on its actions. Rather than learning, the model is trained from its experience(s). It is an autonomous, self-teaching system that essentially learns by trial and error. It performs actions to maximize rewards, or in other words, it is learning by doing to achieve the best outcomes. Reinforcement learning is used in applications like gaming and robotics.

08 Deep Learning

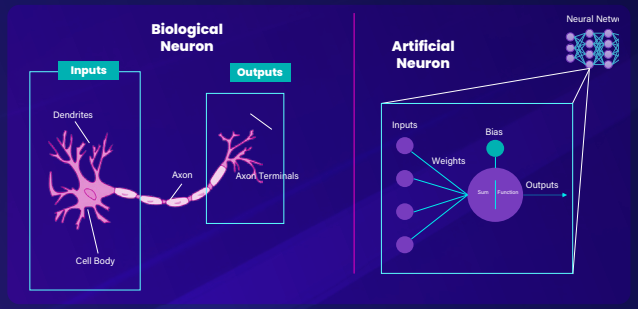
Algorithms inspired by the structure and function of the human brain. These algorithms teach computers to classify, perform regression tasks, and learn from large data sets. Deep learning uses neural networks to recognize patterns and make decisions or predictions. These models are specifically engineered to make sense of complex patterns and relationships.

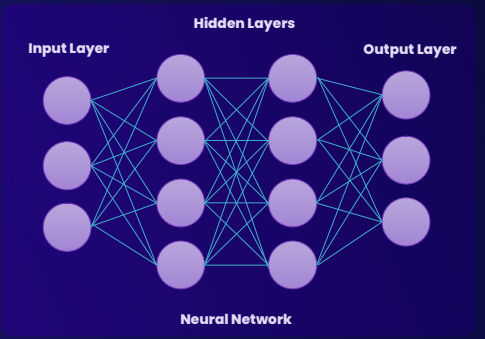
10 Deep Learning Algorithms

- Classic Neural Networks
- Generative Adversarial Networks
- Transfer Learning
- Restricted Boltzmann Machines
- Transformer Model
- Convolutional Neural Networks
- Self-Organizing Maps
- Deep Reinforcement Learning
- Autoencoders
- Backpropragation

09 Neural Networks

Computational models that are essential for deep learning. Based on the structure of neural networks in the brain, these models are created using interconnected artificial neurons or nodes, organized into layers. Data is input into the layers, and the data pairs or a loss function make it possible to adjust weights and measure the discrepancy between predicted and desired outputs. Neural networks are focused on finding complex patterns in data and can be adapted for many types of data. They are used for advanced speech recognition, image classification, and natural language processing.





FINISH LINE

13 RAG

A pipeline that enhances the performance of LLMs. Retrieval-Augmented Generation (RAG) allows the models to retrieve data from external sources in addition to their trained data sets to optimize predications. RAG pipelines are heavily dependent on vector databases and they allow LLMs to learn based on new data.

12 Foundation Models

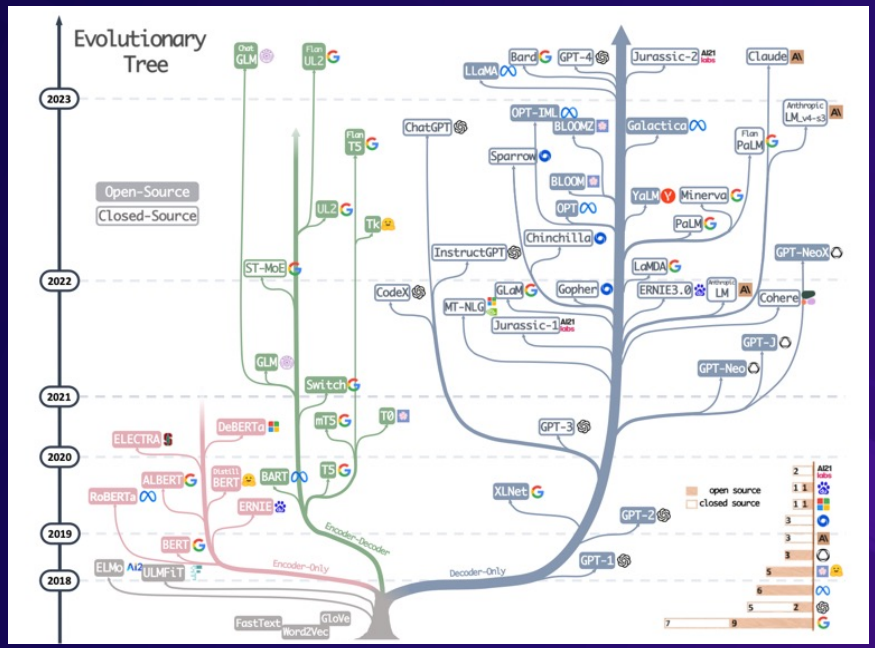
An AI neural network used in Generative AI. They are also called large AI models, and they are trained on enormous data sets. They are typically used with unsupervised learning, and are used across a wide variety of use cases. Foundation models are the foundation of applications like ChatGPT, and they are also used from everything from text synthesis and image identification to audio generation.

11 Generative AI

A branch of AI that focuses on creating and generating new content. AI models are trained on enormous data sets and then use what they learn in those data sets to generate new content. These models are specifically engineered to find patterns and use those patterns to produce novel content and answers to prompts in the form of images, text, videos, and audio samples. Examples of specific GenAI models include Variational Autoencoders (VAEs) and Generative Adversarial Networks (GANs).

10 Large Language Models

Complex, sophisticated AI models designed to understand and generate human language. Large language models (LLMs) are trained on vast amounts of text data and utilize deep learning techniques, such as neural networks, to process and generate language-based tasks including text generation, translation, summarization, question-answering, and sentiment analysis. One notable example of a large language model is OpenAI's GPT (Generative Pre-trained Transformer) series.



https://abiaryan.com/posts/intro-llms

Generative AI is Transforming the World

Marketing & Content

This type of tool can help in creating personalized and targeted marketing campaigns and advertisements.

Art & Design

Generative AI can create new visual art, logos and other designs, and more.

Customer Service

Generative AI can handle customer and internal queries when trained on knowledge bases.

Medicine & Research

This technology can even assist in drug discovery by generating novel chemical structures.

Fashion & Retail

Generative AI can create new clothing designs and predict fashion trends.

Entertainment & Music

This kind of AI has already created songs in the style of some artists.

Gaming

Generative AI can create new levels, characters, and scenarios in games, making them more engaging and interactive.

Technology

These tools can help write documentation and code projects.

Start to Finish: WEKA Accelerates AI Projects

Learn what makes AI data pipelines unique and how WEKA makes it possible for companies to bring their AI projects to life.

DIVE INTO AI DATA PIPELINES »