Language system

NLP, AI

[**Natural Language Processing**](https://monkeylearn.com/natural-language-processing/)**(NLP)** is a branch of **Artificial Intelligence (AI)** that studies how machines understand human language. Its goal is to build systems that can make sense of text and perform tasks like translation, grammar checking, or topic classification.

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Companies are increasingly using NLP-equipped tools to gain insights from data and to automate routine tasks. This [sentiment analyzer](https://monkeylearn.com/sentiment-analysis-online/), for instance, can help brands detect emotions in text, such as negative comments on social media.

But what exactly is Natural Language Processing? How does it differ from other related terms, like AI and machine learning?

1. [What is Natural Language Processing (NLP)?](https://monkeylearn.com/#what-is)
2. [NLP, AI, Machine Learning: What’s the Difference?](https://monkeylearn.com/#difference)
3. [NLP Techniques](https://monkeylearn.com/#techniques)
4. [5 Use Cases of NLP in Business](https://monkeylearn.com/#use-cases)

What Is Natural Language Processing?

[Natural Language Processing (NLP)](https://monkeylearn.com/natural-language-processing/) makes it possible for computers to understand the human language.

Probably, the most popular examples of NLP in action are virtual assistants, like Google Assist, Siri, and Alexa. NLP understands and translates the human language, like *“Hey Siri, where is the nearest gas station?”* into numbers, making it easy for machines to understand.

Another well-known application of NLP are chatbots, which can help you solve issues while performing natural language generation – in other words, holding a conversation in plain English!

There are many other everyday apps you use, where you’ve probably encountered NLP without even noticing. Text recommendations when writing an email, offering to translate a Facebook post written in a different language, or filtering unwanted promotional emails into your spam folder.

In a nutshell, the goal of Natural Language Processing is to make human language ‒ which is complex, ambiguous, and extremely diverse ‒ easy for machines to understand.

How does it work? First, it applies linguistics to analyze the grammatical structure and the meaning of words, then it uses algorithms to build intelligent systems capable of performing different tasks.

NLP, AI, Machine Learning: What’s the Difference?

Natural Language Processing (NLP), Artificial Intelligence (AI), and machine learning (ML) are sometimes used interchangeably, so you may get your wires crossed when trying to differentiate between the three.

The first thing to know is that NLP and machine learning are both subsets of Artificial Intelligence.

AI is an umbrella term for machines that can simulate human intelligence. AI encompasses systems that mimic cognitive capabilities, like learning from examples and solving problems. This covers a wide range of applications, from self-driving cars to predictive systems.

[Natural Language Processing (NLP)](https://monkeylearn.com/natural-language-processing/) deals with how computers understand and translate human language. With NLP, machines can make sense of written or spoken text and perform tasks like translation, keyword extraction, topic classification, and more.

But to automate these processes and deliver accurate responses, you’ll need [machine learning](https://monkeylearn.com/machine-learning/). Machine learning is the process of applying algorithms that teach machines how to automatically learn and improve from experience without being explicitly programmed.

AI-powered chatbots, for example, use NLP to interpret what users say and what they intend to do, and machine learning to automatically deliver more accurate responses by learning from past interactions.

NLP Techniques

Natural Language Processing (NLP) applies two techniques to help computers understand text: syntactic analysis and semantic analysis.

Syntactic Analysis

Syntactic analysis ‒ or parsing ‒ analyzes text using basic grammar rules to identify sentence structure, how words are organized, and how words relate to each other.

Some of its main sub-tasks include:

* **Tokenization** consists of breaking up a text into smaller parts called *tokens* (which can be sentences or words) to make text easier to handle.
* **Part of speech tagging (PoS tagging)** labels tokens as *verb, adverb, adjective,* *noun*, etc. This helps infer the meaning of a word (for example, the word “book” means different things if used as a verb or a noun).
* **Lemmatization & stemming** consist of reducing inflected words to their base form to make them easier to analyze.
* **Stop-word removal** removes frequently occuring words that don’t add any semantic value, such as *I, they, have, like, yours*, etc.

Semantic Analysis

Semantic analysis focuses on capturing the meaning of text. First, it studies the meaning of each individual word (lexical semantics). Then, it looks at the combination of words and what they mean in context. The main sub-tasks of semantic analysis are:

* **Word sense disambiguation** tries to identify in which sense a word is being used in a given context.
* **Relationship extraction** attempts to understand how entities (places, persons, organizations, etc) relate to each other in a text.

5 Use Cases of NLP in Business

[NLP tools](https://monkeylearn.com/blog/natural-language-processing-tools/) are helping companies understand how their customers perceive them across all channels of communication, whether emails, product reviews, social media posts, surveys, and more.

Not only can AI tools be used to understand online conversations and how customers are talking about businesses, they can also be used to automate repetitive and time-consuming tasks, increase efficiency, and enable workers to focus on more fulfilling tasks.

Here are some of the main applications of NLP in business:

Sentiment Analysis

[Sentiment analysis](https://monkeylearn.com/sentiment-analysis/) identifies emotions in text and classifies opinions as positive, negative, or neutral. You can see how it works by pasting text into this [free sentiment analysis tool](https://monkeylearn.com/sentiment-analysis-online/).

By analyzing social media posts, product reviews, or online surveys, companies can gain insight into how customers feel about brands or products. For example, you could [analyze tweets mentioning your brand in real-time](https://monkeylearn.com/blog/social-media-sentiment-analysis/) and detect comments from angry customers right away.

Maybe you want to send out a survey to find out how customers feel about your level of customer service. By analyzing [open-ended responses to NPS surveys](https://monkeylearn.com/blog/sentiment-analysis-of-survey-responses/), you can determine which aspects of your customer service receive positive or negative feedback.

Language Translation

Machine translation technology has seen great improvement over the past few years, with [Facebook’s translations achieving superhuman performance](https://ai.facebook.com/blog/facebook-leads-wmt-translation-competition/) in 2019.

Translation tools enable businesses to communicate in different languages, helping them improve their global communication or break into new markets.

You can also train translation tools to understand specific terminology in any given industry, like finance or medicine. So you don’t have to worry about inaccurate translations that are common with generic translation tools.

Text Extraction

Text extraction enables you to pull out pre-defined information from text. If you deal with large amounts of data, this tool helps you recognize and extract [relevant keywords](https://monkeylearn.com/keyword-extraction/) and features (like product codes, colors, and specs), and [named entities](https://monkeylearn.com/blog/named-entity-recognition/) (like names of people, locations, company names, emails, etc).

Companies can use text extraction to automatically find key terms in legal documents, identify the main words mentioned in customer support tickets, or pull out product specifications from a paragraph of text, among many other applications. Sounds interesting? Here’s a [keyword extraction tool](https://monkeylearn.com/keyword-extractor-online/) you can try.

Chatbots

Chatbots are AI systems designed to interact with humans through text or speech.

The [use of chatbots for customer care](https://monkeylearn.com/blog/customer-care-ai/) is on the rise, due to their ability to offer 24/7 assistance (speeding up response times), handle multiple queries simultaneously, and free up human agents from answering repetitive questions.

Chatbots actively learn from each interaction and get better at understanding user intent, so you can rely on them to perform repetitive and simple tasks. If they come across a customer query they’re not able to respond to, they’ll pass it onto a human agent.

Topic Classification

[Topic classification](https://monkeylearn.com/topic-analysis/) helps you organize unstructured text into categories. For companies, it’s a great way of gaining insights from customer feedback.

Imagine you’d like to analyze hundreds of open-ended responses to NPS surveys. How many responses mention your customer support? What percentage of customers talk about *“Pricing”*? With this [topic classifier for NPS feedback](https://monkeylearn.com/nps-feedback-analysis-online/), you’ll have all your data tagged in seconds.

Also, you can use topic classification to [automate the process of tagging incoming support tickets](https://monkeylearn.com/blog/ticket-classification-with-ai/) and automatically route them to the right person.

Closing

Natural Language Processing (NLP) is the part of AI that studies how machines interact with human language. NLP works behind the scenes to enhance tools we use every day, like chatbots, spell-checkers, or language translators.

Combined with machine learning algorithms, NLP creates systems that learn to perform tasks on their own and get better through experience. NLP-powered tools can help you classify social media posts by sentiment, or extract named entities from business emails, among many other things.

[MonkeyLearn](https://monkeylearn.com/) is a user-friendly AI platform that helps you get started with NLP in a very simple way, using pre-trained models or building customized solutions to fit your needs.

[Sign-up to MonkeyLearn for free](https://app.monkeylearn.com/accounts/register/) and explore all you can do with your data!