

Introduction to Natural Language Processing (NLP)

Natural Language Processing (NLP) is a field of Artificial Intelligence (AI) that focuses on the interaction between computers and humans using natural language. It enables machines to read, understand, and derive meaning from human languages.

Common Tasks in NLP:

- Tokenization: Splitting text into individual words or sentences.
- Stopword Removal: Eliminating commonly used words that do not carry significant meaning.
- Stemming: Reducing words to their root form (e.g., "running" becomes "run").
- Lemmatization: Mapping words to their base or dictionary form.
- Named Entity Recognition (NER): Identifying proper nouns like names, places, and brands in text.
- Sentiment Analysis: Detecting emotions like positive, negative, or neutral sentiment in text.

Applications of NLP:

1. Chatbots
2. Machine Translation
3. Text Summarization
4. Information Extraction
5. Spam Detection

Real-Life Examples:

- Google Translate
- Siri and Alexa
- Gmail's Smart Compose
- Customer Support Bots

NLP continues to evolve with deep learning and transformer models like BERT and GPT. These models significantly improve the performance of language-based AI applications.