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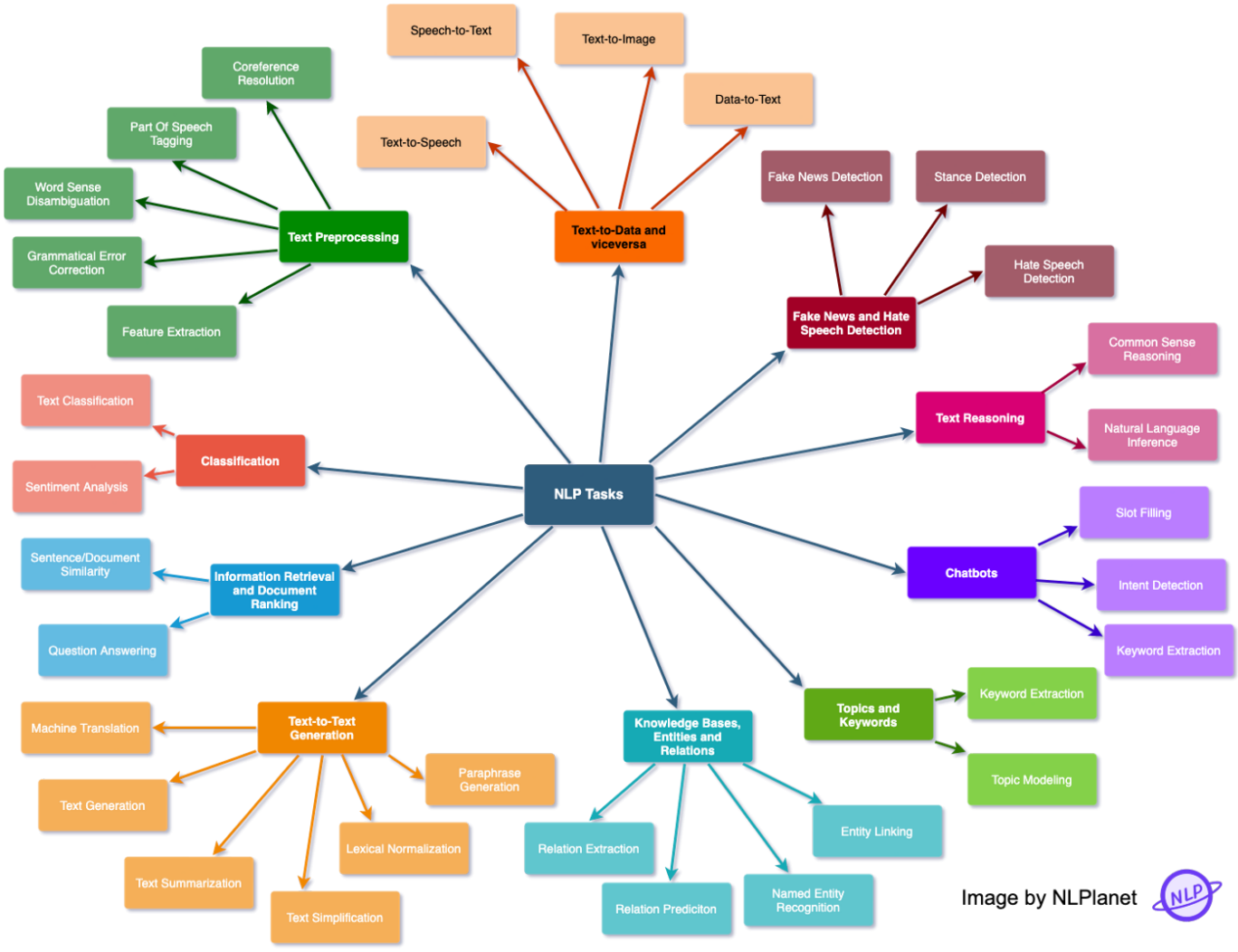
Two minutes NLP — 33 important NLP tasks explained

Information Retrieval, Knowledge Bases, Chatbots, Text Generation, Text-to-Data, Text Reasoning, etc.



Taxonomy of NLP tasks. Image by the author.

> *Hello fellow NLP enthusiasts! Today I'll sketch the NLP landscape with a brief explanation of 33 common NLP tasks. I'll try to make it simple and not simplistic as much as I can, therefore take the article as a starting point to delve into the field. Let's begin!* 😄

Classification

- Text Classification: assigning a category to a sentence or document (e.g. spam filtering).
- Sentiment Analysis: identifying the polarity of a piece of text.

Information Retrieval and Document Ranking

- Sentence/document similarity: determining how similar two texts are

- Machine Translation: translating from one language to another.
- Text Generation: creating text that appears indistinguishable from human-written text.
- Text Summarization: creating a shortened version of several documents that preserves most of their meaning.
- Text Simplification: making a text easier to read and understand, while preserving its main ideas and approximate meaning.
- Lexical Normalization: translating/transforming a non-standard text to a standard register.
- Paraphrase Generation: creating an output sentence that preserves the meaning of input but includes variations in word choice and grammar.

Knowledge bases, entities and relations

- Relation extraction: extracting semantic relationships from a text. Extracted relationships usually occur between two or more entities and fall into specific semantic categories (e.g. lives in, sister of, etc).
- Relation prediction: identifying a named relation between two named semantic entities.
- Named Entity Recognition: tagging entities in text with their corresponding type, typically in BIO notation.
- Entity Linking: recognizing and disambiguating named entities to a knowledge base (typically Wikidata).

Topics and Keywords

- Topic Modeling: identifying abstract “topics” underlying a collection of documents.
- Keyword Extraction: identifying the most relevant terms to describe the subject of a document

Chatbots

- Intent Detection: capturing the semantics behind messages from users and assigning them to the correct label.
- Slot Filling: aims to extract the values of certain types of attributes (or slots, such as cities or dates) for a given entity from texts.
- Dialog Management: managing of state and flow of conversations.

Text Reasoning

- Common Sense Reasoning: use of “common sense” or world knowledge to make inferences.
- Natural Language Inference: determining whether a “hypothesis” is true (entailment), false (contradiction), or undetermined (neutral) given a “premise”.

Fake News and Hate Speech Detection

- Fake News Detection: detecting and filtering out texts containing false and misleading information.
- Stance Detection: determining an individual’s reaction to a primary actor’s claim. It is a core part of a set of approaches to fake news assessment.
- Hate Speech Detection: detecting if a piece of text contains hate speech.

Text-to-Data and viceversa

- Text-to-Speech: technology that reads digital text aloud.
- Speech-to-Text: transcribing speech to text.
- Text-to-Image: generating photo-realistic images which are semantically consistent with the text descriptions.
- Data-to-Text: producing text from non-linguistic input, such as databases of records, spreadsheets, and expert system knowledge




- Coreference Resolution: clustering mentions in text that refer to the same underlying real-world entities.
- Part Of Speech (POS) tagging: tagging a word in a text with its part of speech. A part of speech is a category of words with similar grammatical properties, such as noun, verb, adjective, adverb, pronoun, preposition, conjunction, etc.
- Word Sense Disambiguation: associating words in context with their most suitable entry in a pre-defined sense inventory (typically WordNet).
- Grammatical Error Correction: correcting different kinds of errors in text such as spelling, punctuation, grammatical, and word choice errors.
- Feature Extraction: extraction of generic numerical features from text, usually embeddings.

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