ecnológico
Monterrey

NLP 2

Inteligencia artificial avanzada para la ciencia de datos II Modulo 5 NLP 2

Introduction

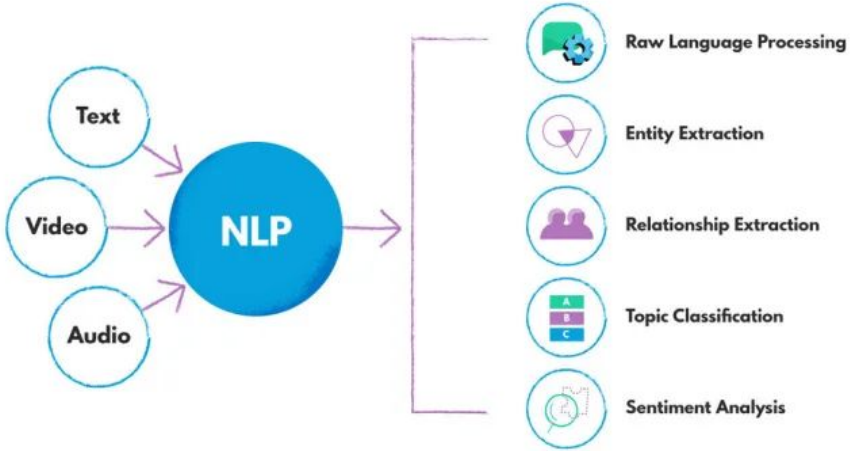
Language understanding

Human language have multiple representations, however its main objective is to communicate between humans.

Are machines ready to understand us ....?

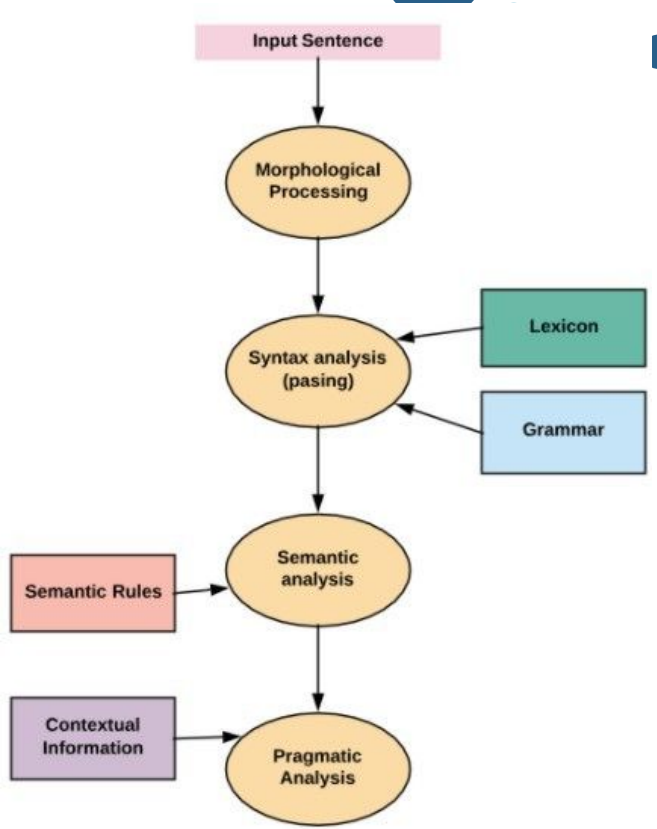
The way machine deals language

Language usually is represented as phonograph expressions (words) and we are able to transmitted, stored and computed in its written representation (text).

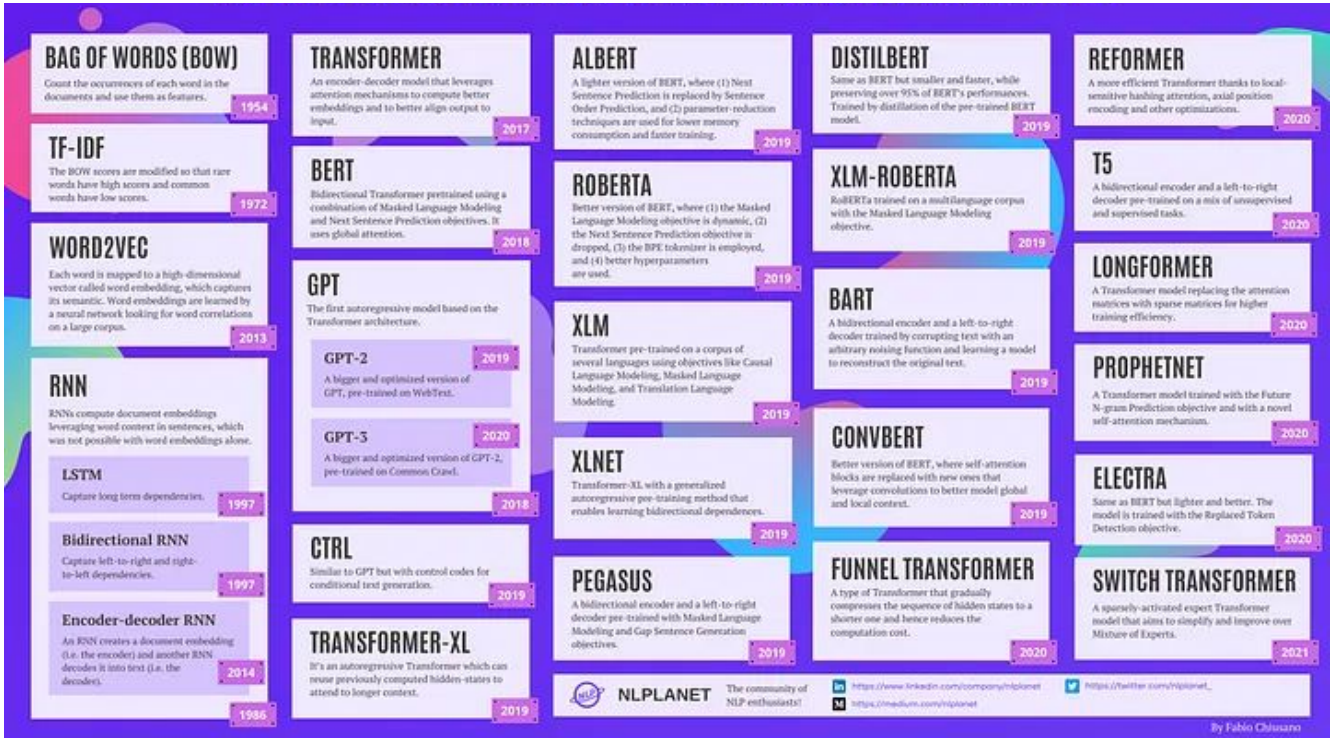


Analysis phases

NLP tools and techniques are focus on one or several phases to analyze and compute language



Brief history



Two main type of models

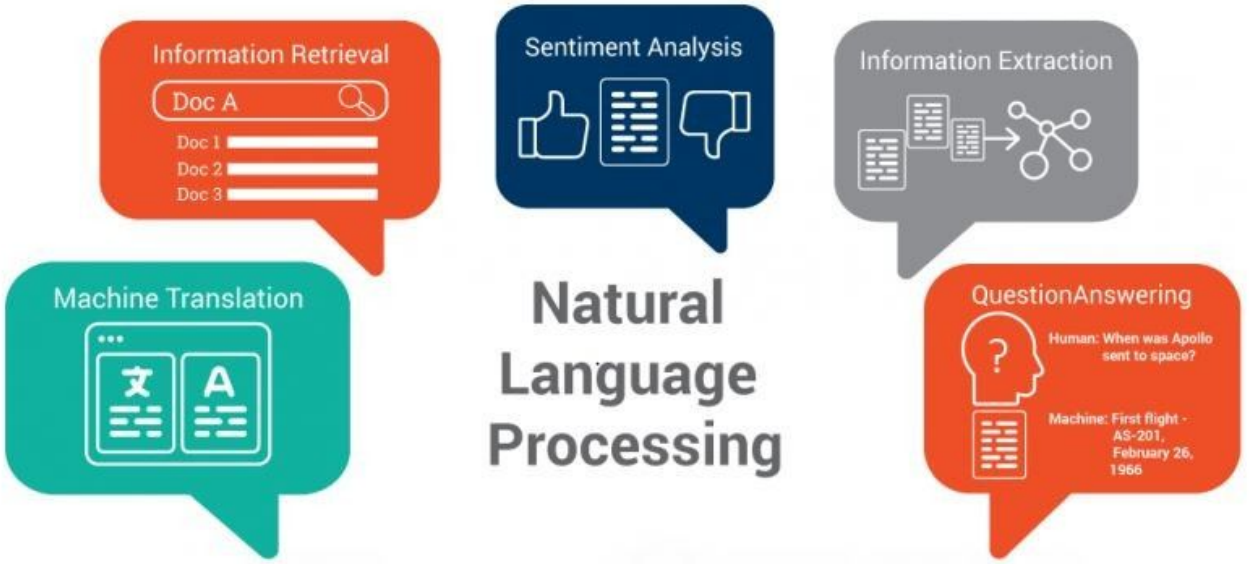
Statistical Language model

This methods uses traditional statistical techniques, like n-gram, bag of words and TF-IDF.

Neural Network models

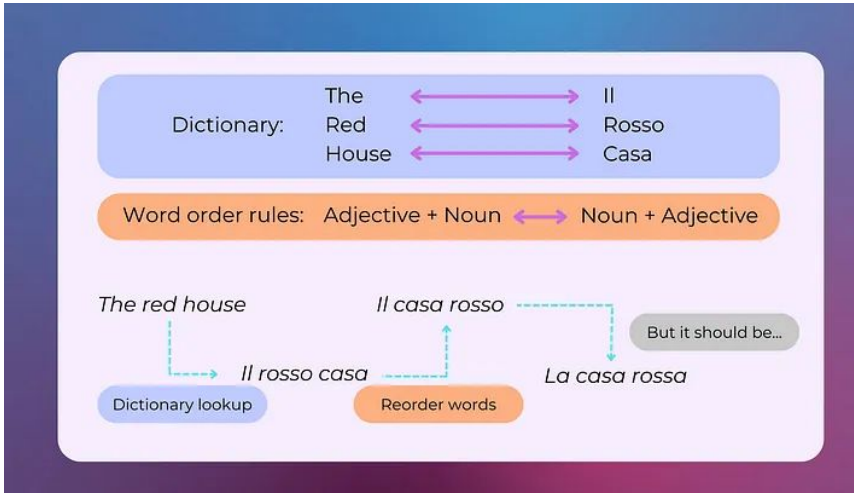
This methods uses Deep Neural Networks to provide more efficiency than statistical models, this is common in modern NLP.

Tasks to solve



First steps

Morphological and lexical analysis it's wild use for idioms translators, by detecting **words** (patterns) we are able to distinguish words from other characters, for example a dictionary of words and it's equivalent in other idiom.



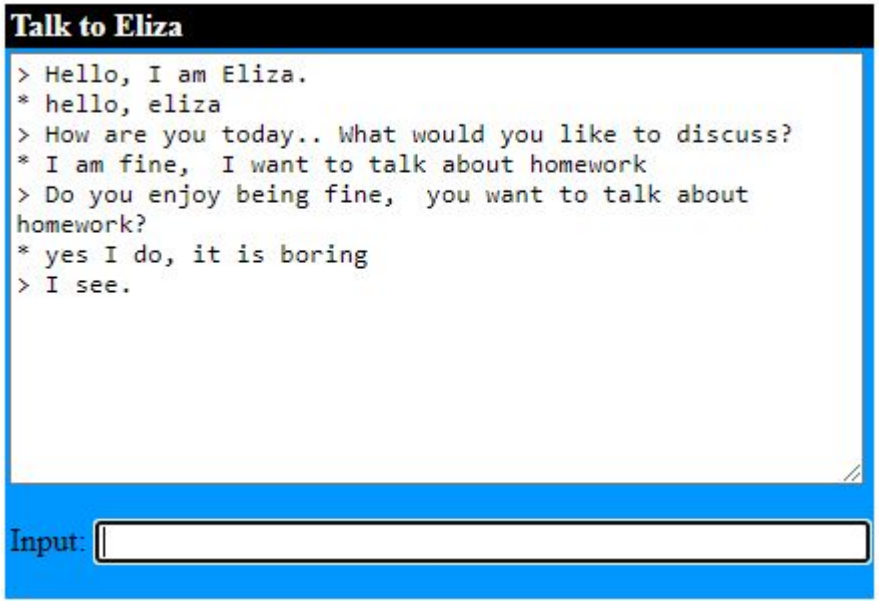
Syntax analysis it's also important for translation task, in this scenario syntax means that model needs to understand sentences and phrases, for example grammar rules that helps to understand the meaning of a sentence.

The real challenge

Lexical and syntax is useful but it is not enough for modern NLP problems.

For example in the 60's an AI named ELIZA was created to emulate a therapist.

Eliza is probably the oldest chatbot ever invented and people thought it truly understand humans however the illusion happened because Eliza understands lexical and syntax and answers valid grammar answers but there is no true meaning.



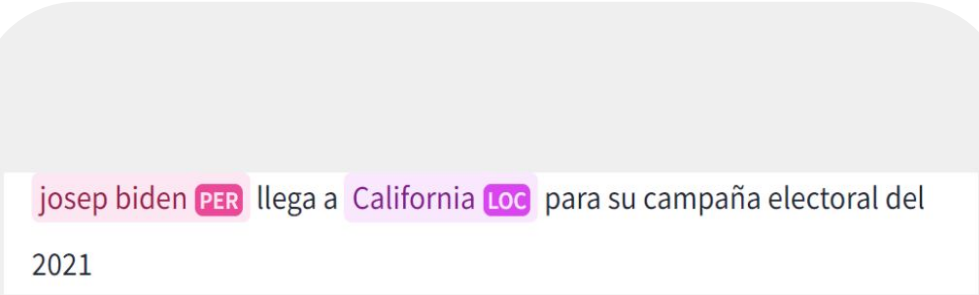
https://psych.fullerton.edu/mbirnbaum/psych101/eliza.htm

Semantics

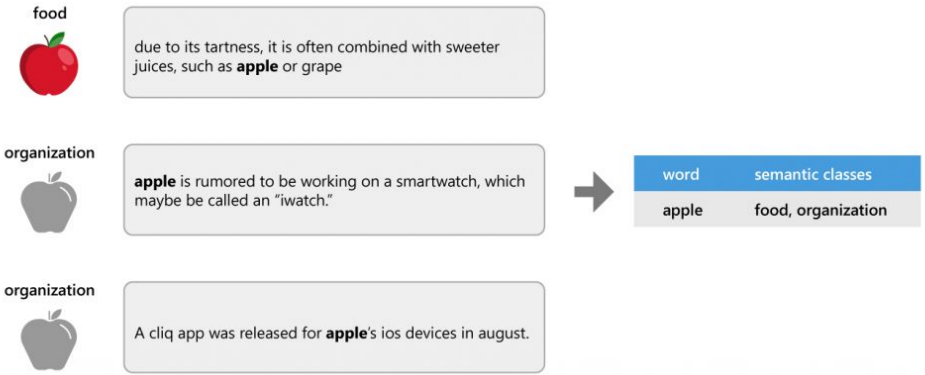
Semantics analysis is one of the biggest tasks in NLP.

Semantics understand the “meaning” of phrases and words.

For example:



Context



Context analysis includes a more sophisticated approach than semantics, this is primarily because it deals with a big human language problem ... **ambiguity** !!!

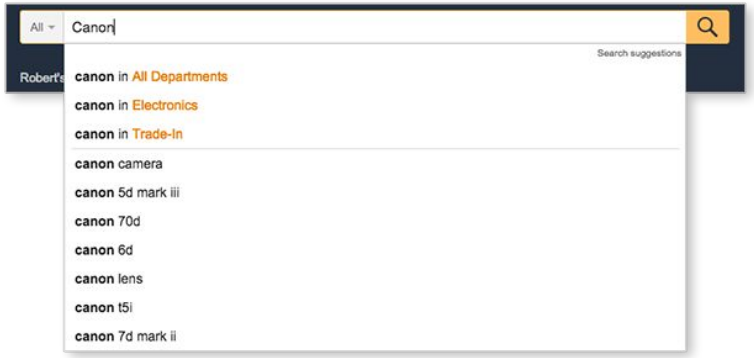
Models and encodings like word2vec helps to understand context as humans, semantic changes depending on the **context we are talking about.**

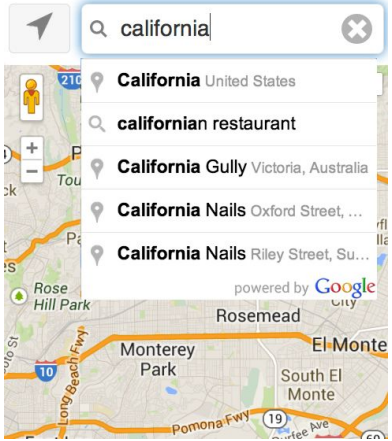
Pragmatics

Finally, pragmatics analysis are fined tuned models that uses real world information to give context.

For example “alexa, would you remind me to take a pill ? “ actually means “alexa, remind me to take a pill in the future”.

The first one is a more human way to communicate than the second one.





Pragmatics also depends on how humans usually ask information for specific tasks so context is important

Thanks

Do you have any questions?

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Slack #module-5-nlp-1