Introduction to Natural Language Processing

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Natural Language processing ?

In French : Traitement Automatique du Langage Naturel (TALN)

Crossroads of :

- Artificial Intelligence
- Linguistics
- Machine learning

Natural Language processing ?

Objectives :

- Extract meaning from textual data
- Speech synthesis, natural language generation

https://www.youtube.com/watch?v=Ea_ytY0UDs0 Luc Steels - BREAKING THE WALL TO LIVING ROBOTS. How Artificial Intelligence Research Tries to Build Intelligent Autonomous Systems - 1 min 52

NLP applications

?

NLP applications

- Automatic translation (Google translate)
- Textual data mining/ document classification / information extraction
- Spell-checkers
- Automatic summary
- Human-Computer interactions
- Speech recognition
- Speech synthesis
- Opinion analysis (from social media)

The textual Data

Natural language is everywhere on the web :

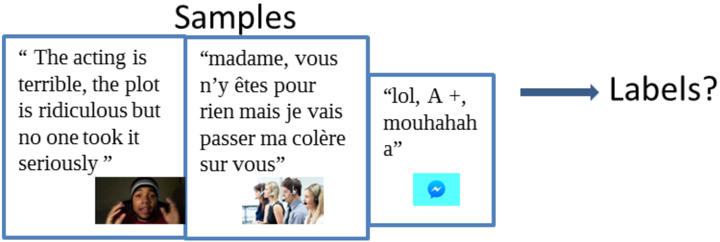
in companies : chatbots, callcentres, mails, etc.
at home : amazon echo, siri, google home

The textual Data and its challenges

First Challenge : build models that represent language that is far from academic writing : spontaneous expressions (abbreviations, hashtags, acronyms, typos/mistakes, oral transcript)

The textual Data and its challenges

Second challenge : build model from small labelled dataset when labels are difficult to obtain (ex : opinions)



The textual Data and its challenges

Third challenge – explainability : build transparent and explainable models

MDI341 and INF344 Pedagogical team

NLP lectures and labs during

- MDI341 (P3) : focus on Machine/Deep learning for NLP
- INF344 (P4) : focus on linguistic approaches

Lectures given by **Matthieu Labeau** and **CLAVEL Chloe**
Labs given by **Matthieu Labeau**

MDI341 : focus on Machine Learning

2 Lectures

- Word embeddings and Deep learning for NLP **CLAVEL Chloe** (hybrid)
- Sequential models for NLP **Matthieu Labeau** (remotely)

2 Labs

- Word embeddings **Matthieu Labeau** (remotely)
- Sequential models **Matthieu Labeau** (remotely)

INF344 : focus on linguistic approaches

2 Lectures (**C. Clavel**)

- Pre-processing, syntactic analysis and resources for Natural Language Processing
- Sentiment Analysis

3 Labs (**M. Labeau**)

- Bert representation for information extraction
- Linguistic approaches for sentiment analysis
- Pre-processing and machine learning for sentiment analysis

At the end of the course...

- You will be able to describe and implement the different methods for text representation into vectors
- You will master the main linguistic issues for NLP
- You will be able to build a text classification framework