CPE 372/641 Natural Language Processing

Conclusion

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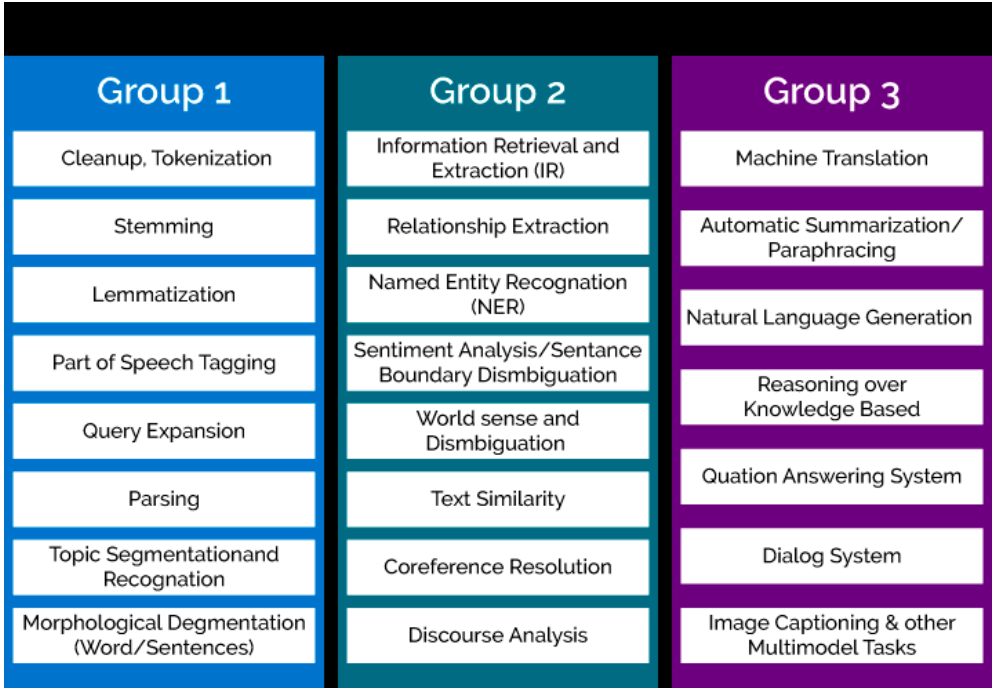
Natural language processing (**NLP**)
is a field of computer science, artificial intelligence, and computational linguistics concerned with the interactions between computers and human (natural) languages

Major applications and tasks in NLP:

- Machine translation
- Named entity recognition
- Part-of-speech tagging
- Parsing
- Question answering
- Sentiment analysis
- Speech recognition
- Information retrieval
- Information extraction
- Automatic summarization

Types of applications in NLP



NLP (NLG) at Google

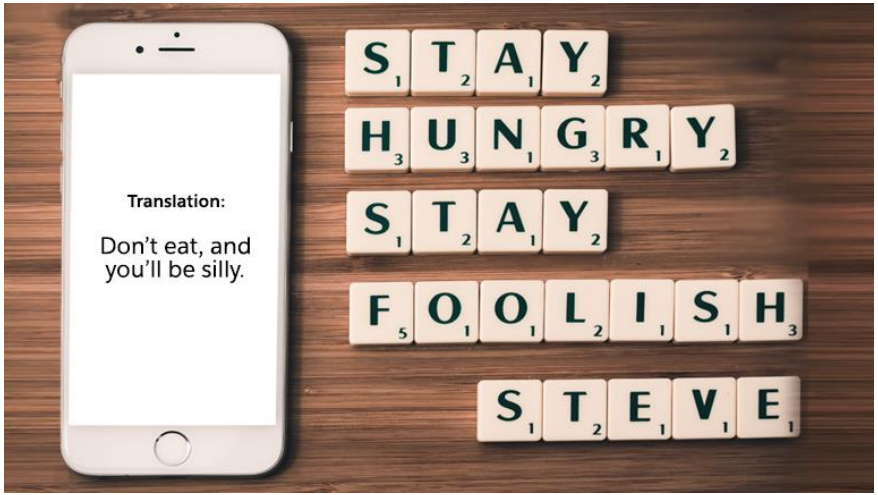
https://youtu.be/MNvT5JekDpg

What have we learned?

- From characters to words to sentences
  - Regular expressions
  - Finite State Machine
  - Minimum Edit Distance
  - Morphological Processing
  - Semantic Representation, FOPC
  - Semantic vectors
  - Syntactic Structures and Parsing
  - Information retrieval
  - Question answering
  - Sentiment analysis
  - Machine Translation

What haven’t we learned?

- Something ‘beyond’ sentence level:
  - Discourse = understanding whole paragraph, text, pronoun resolution
  - Pragmatics = language use
  - Idioms, metaphors
- Analyze ‘tone’ of messages
- Grammar checker



Future Direction

- NLP moves from rules-based towards machine learning/deep learning/neural
- Not much territory left for rule-based

Summary

- Even so, machine learning for NLP can learn from **human knowledge of language (model) (just like what you saw in the video).**
- If you use tools that allow you to create chatbots, but if you don’t add NLP capabilities or knowledge as mentioned above, the conversation with your chatbot is **not** ‘natural’ at all.