



# Natural Language Processing (NLP)

## Lecture 1

### Introduction

# What is NLP ?

A subfield of linguistics, computer science and AI concerned with the interactions between computers and human language in particular how to program computers to process and analyze large amounts of natural language data.



# Data flow model



# How important NLP?

- Individuals using internet (2005: 16.8%---2019: 53.6%)
- Mobile phone applications grow up
- Messages, posts, comments, searches processing
- NLP model with accuracy not less than 95%

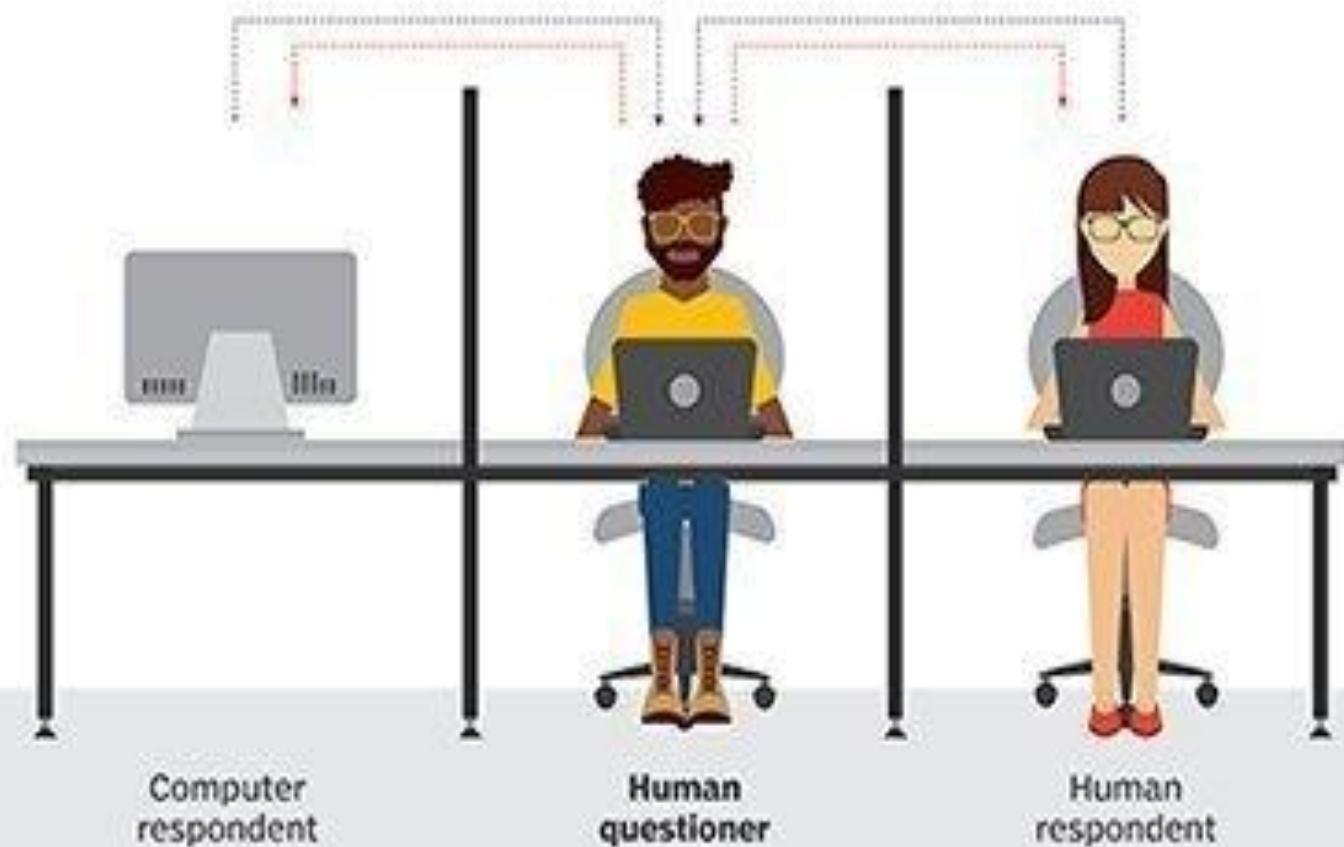
# NLP History

- Philosophers such as Dekart started to put theoretical suggestions such as a way to connect words from different languages.
- In 30's ideas about a translating machine.
- In 1950 Alan Turing founded AI science
- Alan Turing Test

# Turing test

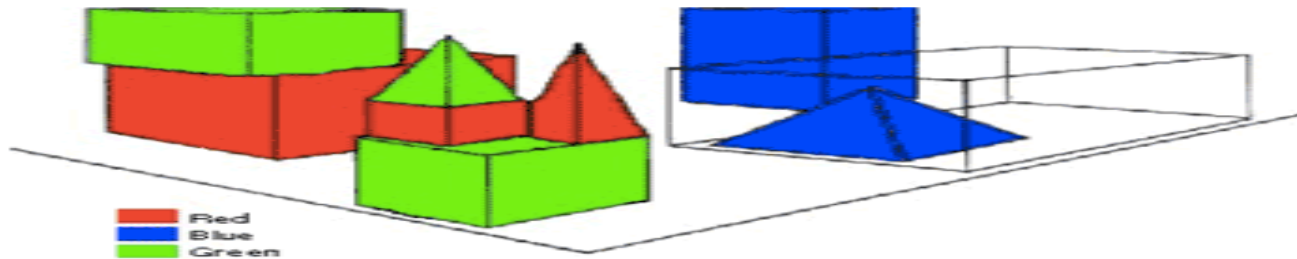
During the Turing test, the human questioner asks a series of questions to both respondents. After the specified time, the questioner tries to decide which terminal is operated by the human respondent and which terminal is operated by the computer.

■ QUESTION TO RESPONDENTS ■ ANSWERS TO QUESTIONER



# NLP History

- In 1968 , SHRDLU by MIT



**Person:** Pick up a big red block.

**Computer:** OK.

**Person:** Grasp the pyramid.

**Computer:** I don't understand which pyramid you mean.

- In 1991, Doctor SBAITSO on DOS

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Dr Sbaitso

Sound Blaster          D R  S B A I T S O          version 2.20
(c) Copyright Creative Labs, Inc. 1992, all rights reserved

>I came to tell you how bored I am
HOW LONG HAVE YOU BEEN

>I have been bored for 10 months
HOW DOES BEEN BORED FOR 10 MONTHS CHANGE YOUR LIFE

>Being bored is boring
REALLY? DOES THAT BOTHER YOU?

>It bothers me how boring you are
DO SUCH QUESTIONS OFTEN COME TO YOUR MIND ?

>It was not a question...
JUST NOW YOU WERE TALKING ABOUT SEXY STUFFS, I WANT TO KNOW MORE ABOUT IT

>I don't want to talk about that anymore.
THAT'S NOT MY PROBLEM

>
```



# NLP History

- In 2006, Watson by IBM



- Starting from 2011 personal assistant has shown up  
2011→ Siri from Apple  
2014→ Alexa and Cortana from Amazon  
2016→ Google assistant  
2017→ Bixby from Samsung



**Alexa vs Siri vs Bixby vs Google Assistant**  
Battle for the Being the Best Virtual Assistant



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[www.pragmatic-voice.com](http://www.pragmatic-voice.com)



# NLP Challenges

## For Example:

All the money he **had had had had** no effect on him

[illegible]

اِنْ اَنْ اَنْ اَنْ اَوْ اَوْ اَوْ



# NLP Challenges

- NLP is considered one of the most complicated DL science
- **Ceiling analysis** : no ML or DL model has an efficiency exceeding the human intelligence
- NLP manages texts (different languages/different accents)
- **Crashed blossoms problem** : miss-understood texts  
➔ Violinist linked to JAL crashed blossoms

A women, without her man, is nothing

A women: without her, man is nothing

- Incorrect typing
- Wrong punctuations

# NLP Applications

- Sentimental analysis (extract positive or negative reviews from comments analysis)
- Machine translation
- Fake news detections
- Classifying E-mails
- Chat Bots and dialogues
- POS tagging
- Para-phrasing detection

THANK YOU ... 😊