

# NLP/ASR

## Unit 1: Introduction to NLP



# 1.1.2

## Basics of NLP

History of NLP techniques

# Rule-based Systems

- 1960s-1980s: The rise of rule-based systems
- Systems like ELIZA (1966) demonstrated early conversational ability
- Emphasis on hand-crafted linguistic rules and grammars
- Limitations in handling ambiguity and variability of natural language

```
Welcome to

EEEEEE LL      IIII ZZZZZZ  AAAAA
EE      LL      II      ZZ  AA  AA
EEEEEE LL      II      ZZ  AAAAAAA
EE      LL      II      ZZ  AA  AA
EEEEEE LLLLLL  IIII ZZZZZZ  AA  AA

Eliza is a mock Rogerian psychotherapist.
The original program was described by Joseph Weizenbaum in 1966.
This implementation by Norbert Landsteiner 2005.

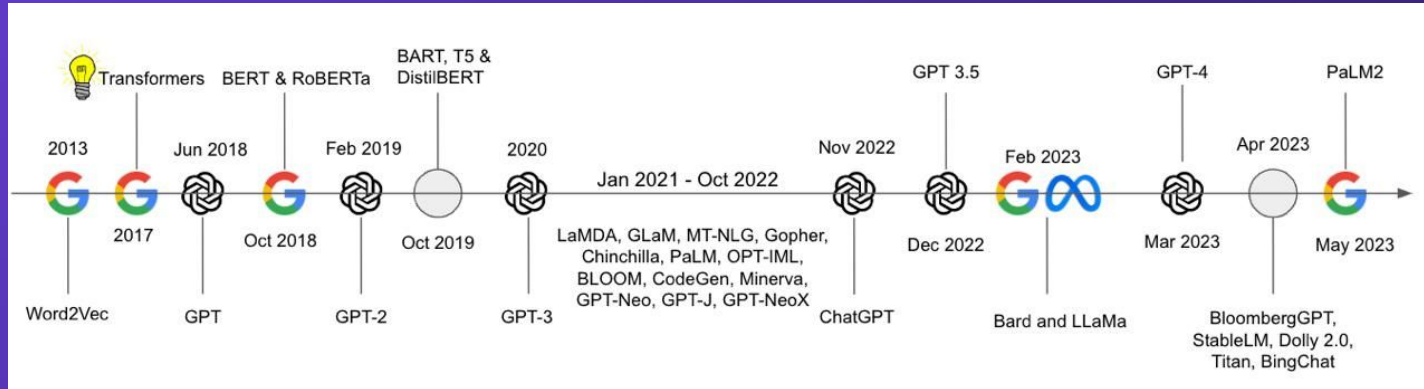
ELIZA: Is something troubling you ?
YOU:   Men are all alike.
ELIZA: What is the connection, do you suppose ?
YOU:   They're always bugging us about something or other.
ELIZA: Can you think of a specific example ?
YOU:   Well, my boyfriend made me come here.
ELIZA: Is it important to you that your boyfriend made you come here ?
YOU:   He says I'm depressed much of the time.
ELIZA: I am sorry to hear that you are depressed.
YOU:   It's true. I am unhappy.
ELIZA: Can you explain what made you unhappy ?
YOU:
```

# Rise of Statistical techniques

- 1990s: Advent of statistical and machine learning approaches
- Algorithms learned language patterns from large datasets (corpora)
- Techniques like Hidden Markov Models (HMMs) powered speech recognition

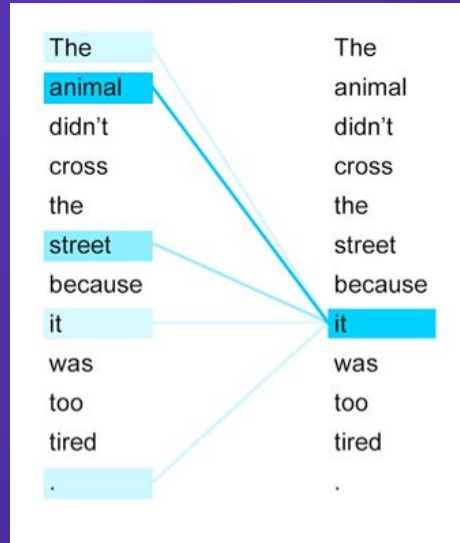
# Deep Learning Era

- 2010s and beyond: deep learning transformed NLP
- Neural networks excelled at complex language tasks
- Breakthroughs in tasks like machine translation, question answering, and text generation



# Transformer Revolution

- Introduced in 2017, Attention mechanism revolutionized NLP
- Transformers excel at capturing relationships between words in a sentence



# Future of NLP

- Pushing boundaries towards seamless human-like communication
- Addressing challenges like bias and explainability
- Potential for even greater personalization and contextual understanding