



Deep Learning For NLP

(Course Code: 25B1WCI737)

Introduction

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What is Natural Language Processing (NLP)?

Definition

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- Chatbot Response
- Sentiment
- Summary
- Question Answer

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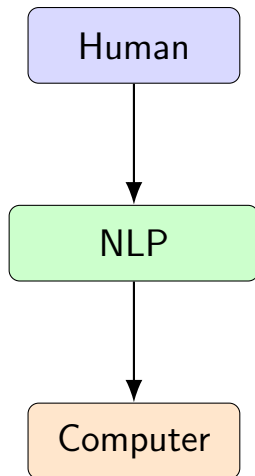
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Simple Example of NLP

Sentence

“Ravi is happy with the new phone.”

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What an NLP System Understands

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- Phone → Object
- Happy → Positive Sentiment
- Topic → Product Review

Why Do We Need Deep Learning in NLP?

Traditional NLP Challenges

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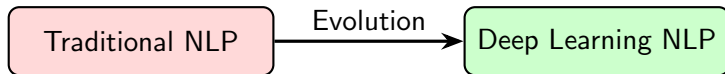
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- Handles large-scale datasets efficiently.
- Achieves state-of-the-art accuracy.



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Key Characteristics

- Automatic feature extraction
- Hierarchical learning
- Large datasets required
- GPU accelerated training
- High prediction accuracy

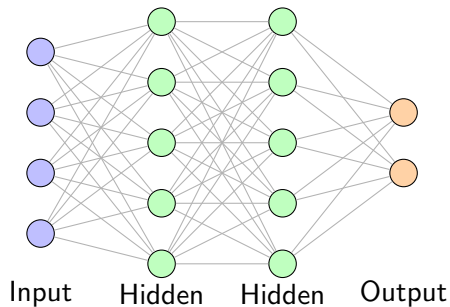
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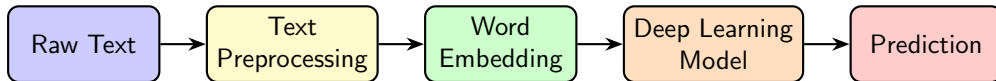
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Deep Learning + NLP

How Deep Learning Processes Text

Deep Learning models transform raw text into numerical representations, learn meaningful language patterns, and generate accurate predictions.



Example Input

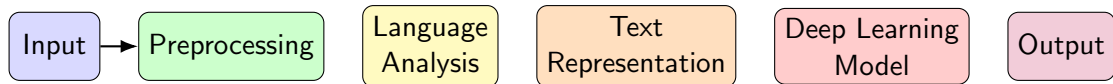
Sentence:

"I love Natural Language Processing."

Possible Applications

- Sentiment Analysis
- Machine Translation
- Chatbots
- Text Classification

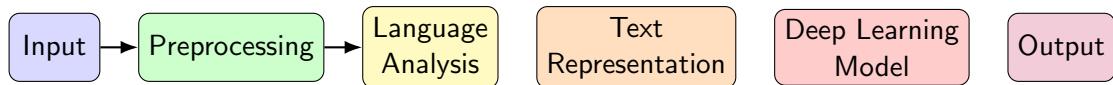
Natural Language Processing Workflow



Examples of Output

- Translation
- Sentiment
- Chatbot Reply
- Text Summary
- Classification

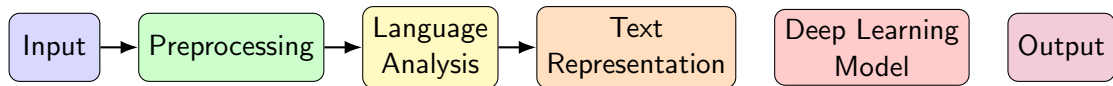
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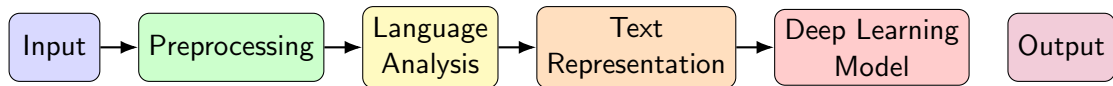
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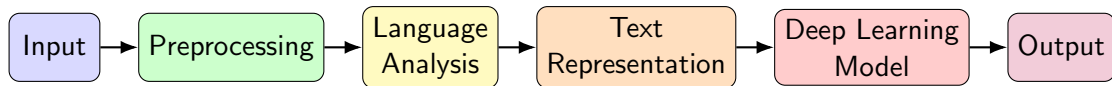
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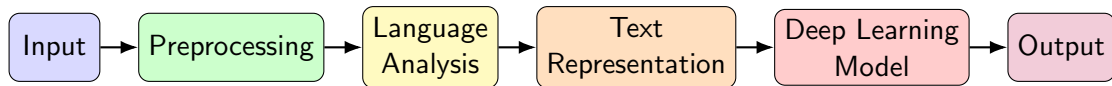
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Major Components of NLP

Natural Language Understanding (NLU)

- Understand text
- Extract meaning
- Identify entities
- Detect sentiment
- Intent recognition

Natural Language Generation (NLG)

- Generate text
- Machine translation
- Text summarization
- Chatbots
- Question answering

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$$\text{NLP} = \text{NLU} + \text{NLG}$$

Real-Life Applications of NLP

Consumer Applications

- Voice Assistants
- Chatbots
- Email Spam Detection
- Auto Complete
- Machine Translation
- Search Engines

Business Applications

- Customer Support
- Medical Diagnosis
- Social Media Analysis
- Fake News Detection
- Recommendation Systems
- Financial Analysis

Summary

Today We Learned

- Introduction to NLP
- Need for NLP
- Human Language vs Computer Language
- NLP Workflow
- NLU and NLG
- Real-world Applications
- Deep Learning in NLP

Next Lecture

Text Preprocessing and Tokenization

Thank You

Questions?