Unlocking NLP with Transformers

Duration: 40 hours

Course Overview

This comprehensive course on Natural Language Processing (NLP) delves into the fundamental principles of text processing, representation, and analysis, equipping learners with both theoretical and practical expertise. Beginning with NLP basics, grammar structures, and sentence boundary detection, the course progresses through text tokenization, normalization, and feature engineering for text representation. It explores cutting-edge advancements in Transformer models, Hugging Face libraries, and billion-parameter architectures while covering multimodal neurons for vision transformers and economic artificial general intelligence (E-AGI). Learners will gain hands-on experience with text classification, summarization, named entity extraction, and text similarity techniques. Additionally, the course introduces chatbot development, the Hugging Face ecosystem, and Python-based data visualization using Seaborn and Plotly. Designed for aspiring AI practitioners, data scientists, and NLP enthusiasts, this course provides a robust foundation for mastering NLP applications in real-world scenarios.

Course Agenda

Module 1: Natural Language Processing Basics

- What is NLP
- Sentence Boundary Detection
- Grammar in NLP and its types
- Constituency Grammar
- Dependency Grammar

Module 2: Processing and Understanding Text

- Text Tokenization
- Text Normalisation
- Data Structures

Module 3: Feature Engineering for Text Representation

- NLP task overview

- Data Clean up with re
- Collocations –Ngram
- Vectorization

Module 4: Transformer

- Introduction to transformer
- Introduction to Hugging Face transformers
- IMDB project Implementation
- Why are Transformers Unique?
- A Developer's View of Transformers
- The Transformer's Architecture
- The Input Sub Layer
- Input Embedding Sub-Layer

Module 5: Experience Billions Transformer of Parameters

- Why Do We Need Billions of Parameters?
- The Flexibility of Transformer Architectures
- Language to Code Generation with OpenAI Codex
- OpenAI Codex to HTML

Module 6: Multimodal Neurons for Vision Transformers

- Multimodal Neurons
- Vision Transformers

Module 7: Economic Artificial General Intelligence (E-AGI)

- Economic AGI: Scope and Perspectives
- Recommender Tasks

Module 8: Text Classification

- Text Classification Blueprint
- Text Normalisation
- Token classification

Module 9: Text Summarization

- Text Summarization and Information Extraction
- Text Summarization Categories
- Stages of Text Summarization
- Feature Matrix
- Single Value Decomposition

Module 10: Analyse text (Named entity extraction)

- Retrieve and process entity information
- Retrieve and process key phrases

Module 11: Text Similarity and Clustering

- Information Retrieval
- Feature Engineering
- Text Similarity

Module 12: ChatBot

- Chatbot
- How do Chatbots Work?
- Types of Chatbots
- Importance of Chatbots
- What is Rasa Chatbot?

Module 13: Hugging Face

- What is a Hugging Face?
- How can you use Hugging FaceEcoSystem ?
- Implementation

Module 14: Python for Data Visualization (Seaborn & Plotly)

- Distribution Plots
- Categorical Plots
- Matrix Plots
- Grids
- Regression Plots
- Geographical Plotting

- Choropleth Maps