

Text Embedding: Everything You Need to Know

Duration: 3.5 Hours

Target Audience:

Text Embedding: everything you need to know course is designed to empower professionals of all backgrounds, whether you're a seasoned AI researcher, software engineer, data scientist, or tech professional involved in natural language processing projects with basic Python knowledge who wants to learn about text embeddings and how to apply them to common NLP tasks

Prerequisites:

Anyone can attend the course

Course Objectives:

This course equips you with the skills to understand and apply text and embeddings with and dive into real-world case studies that showcase with practical knowledge.

Course Outline

Module 1: What is Artificial Intelligence

- Brief history of AI
- Importance and applications of AI
- Building blocks of AI
- Type of AI

AI in Real-world Applications

- Healthcare applications
- Finance and trading
- Autonomous vehicles
- Natural resource management

AI Tools and Technologies

- AI programming languages (e.g., Python)
- AI libraries and frameworks (e.g., TensorFlow, PyTorch)
- AI development environments

Module 2: Introduction to Text Embeddings

- Definition and Overview
- What are text embeddings?
- Importance in natural language processing (NLP).
- History and Evolution
- Early methods of text representation.
- Transition to embeddings.

Module 3: Fundamental Concepts

- Vector Space Models
- Concept of word representation in vector space.
- Dimensionality and Sparsity
- Challenges of high-dimensional spaces.
- Context and Meaning
- How embeddings capture semantic meaning

Module 4: Types of Text Embedding Techniques

- Count-Based Methods
- Bag of Words (BoW), TF-IDF.
- Prediction-Based Methods
- Word2Vec, GloVe.
- Contextual Embeddings
- ELMo, BERT, GPT.

Module 5: Deep insights about Word2Vec and GloVe

- Architecture: CBOW and Skip-gram.
- Training process and optimization.
- GloVe Theory and implementation.
- Comparison of GloVe with Word2Vec.

Module 6: Contextual Embeddings and Transformers

- Challenges in representing larger text units.
- Bi-directionality and context-specific embeddings.
- Transformers Architecture
- Attention mechanism and its impact.

Module 7: Real World Applications and Case Studies

- Real-World Applications
- Examples in search engines, recommendation systems, sentiment analysis.
- Case Studies
- Specific cases where text embeddings significantly improved performance.

Module 8: Future Directions and Ethical Considerations

- Advancements in Text Embeddings
- Potential future developments.
- Ethical and Bias Considerations

Module 9: Various Advanced Embeddings Methods- Part 1

- Word Embeddings
- Contextual Embeddings
- Sentence Embeddings
- Document Embeddings:
- Multilingual Embeddings

Module 10: Various Advanced Embeddings Methods- Part 2

- Evaluation of Embeddings
- Visual-Text Embeddings
- Multimodal Embeddings
- Cross-Domain Embeddings
- Custom Embedding Models
- Efficient Embedding Techniques

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