Lecture: Vector Space Models

✅ **Video:** Week Introduction
47 sec

✅ **Video:** Vector Space Models
2 min

📖 **Reading:** Vector Space Models
10 min

▶ **Video:** Word by Word and Word by Doc.
4 min

📖 **Reading:** Word by Word and Word by Doc.
10 min

🖥 **Lab:** Linear algebra in Python with Numpy
1h

▶ **Video:** Euclidean Distance
3 min

📖 **Reading:** Euclidian Distance
10 min

▶ **Video:** Cosine Similarity: Intuition
2 min

📖 **Reading:** Cosine Similarity: Intuition
10 min

▶ **Video:** Cosine Similarity
3 min

📖 **Reading:** Cosine Similarity
10 min

Vector Space Models

Vector spaces are fundamental in many applications in NLP. If you were to represent a word, document, tweet, or any form of text, you will probably be encoding it as a vector. These vectors are important in tasks like information extraction, machine translation, and chatbots. Vector spaces could also be used to help you identify relationships between words as follows:

- You eat _cereal_ from a _bowl_

- You _buy_ something and someone else _sells_ it

Information Extraction

Machine Translation

Chatbots

The famous quote by Firth says, **"You shall know a word by the company it keeps".** When learning these vectors, you usually make use of the neighboring words to extract meaning and information about the center word. If you were to cluster these vectors together, as you will see later in this specialization, you will see that adjectives, nouns, verbs, etc. tend to be near one another. Another cool fact, is that synonyms and antonyms are also very close to one another. This is because you can easily interchange them in a sentence and they tend to have similar neighboring words!