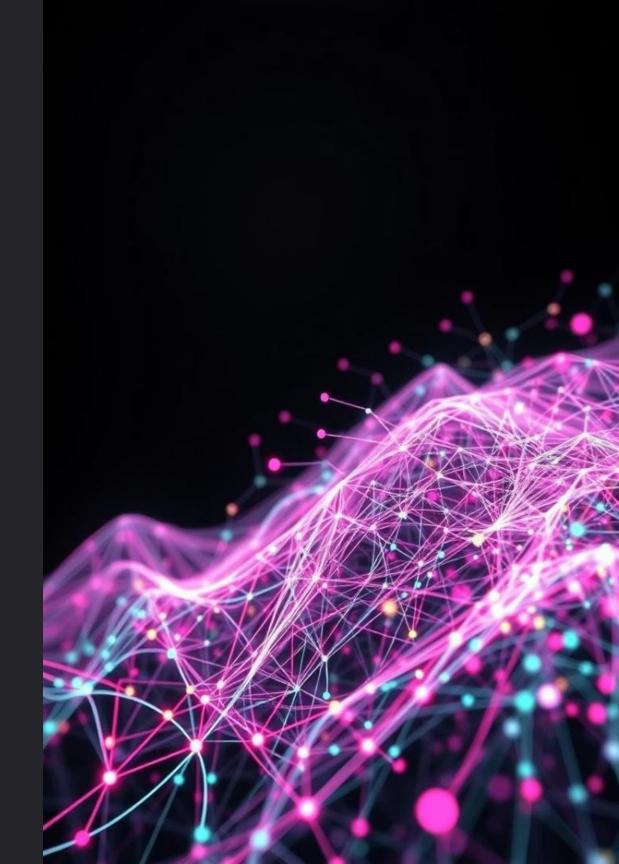
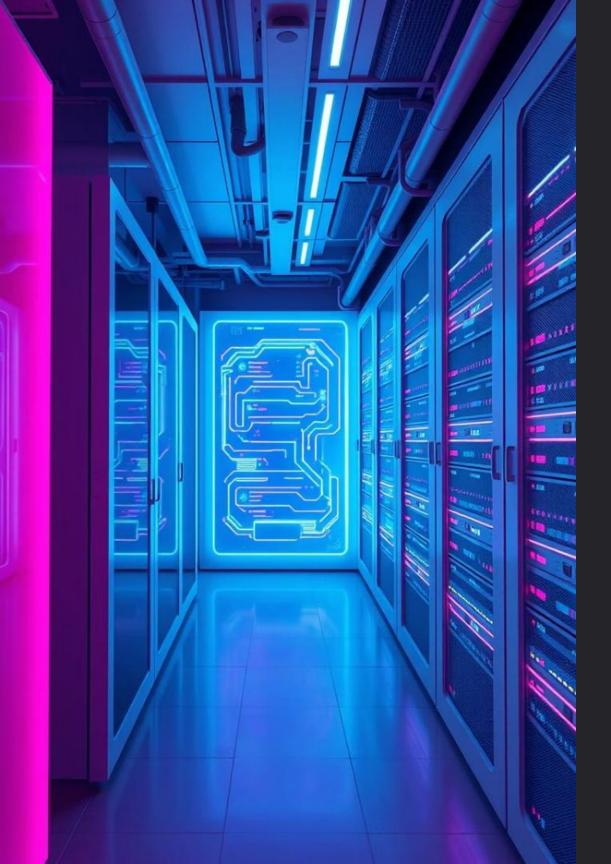
# Vector Stores and Embeddings: The Future of Search

Learn how vector stores and embeddings transform search and recommendations.



by Nisaharan Genhatharan





## What is a Vector Store?

## **Specialized Database**

Designed for fast similarity searches on dense vectors.

## **Optimized Algorithms**

Uses k-Nearest Neighbors (k-NN) for efficient retrieval.

## **Example Systems**

- FAISS
- Pinecone
- Milvus
- Chroma

# Popular Vector Store Technologies

#### **FAISS**

Facebook Al Similarity
Search, high-performance
library.

### Pinecone

Cloud-native vector database, easy to scale and integrate.

### Milvus

Open-source, supports billion-scale vector data.

#### Chroma

Platform focused on embeddings management and search.



# What are Embeddings?

Numerical Representations

Encode text, images, or audio into high-dimensional vectors.

Semantic Meaning

Capture context and meaning beyond simple keywords.

**Similarity Comparisons** 

Enable measuring closeness via cosine similarity.

# How Embeddings are Created

1 Trained Models

BERT, Sentence Transformers, and OpenAl create embeddings. 2 Vector Mapping

Transforms raw data into numerical vectors.

3 Contextual Relationships

Embedding space reflects semantic similarities.

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## Use Case: Semantic Search

## Traditional Search

- Keyword-based
- Limited understanding of meaning
- Exact matches only

## Semantic Search

- Understands intent and context
- Finds related and relevant results
- Boosts accuracy

# Example: Netflix Movie Recommendations

## Plot Embeddings

Netflix encodes movie plots into high-dimensional vectors.

#### **FAISS Search**

Instantly finds movies with similar themes using k-NN.

## **Personalized Suggestions**

Surfaces relevant movies right after you finish watching.



# Example: LinkedIn Job Matching

**Embedding Profiles** 

**Cosine Similarity** 

Résumés and job posts are converted into vectors.

Measures closeness to find suitable job matches.

**Enhanced Matching** 

Improves hiring efficiency and candidate relevance.



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