

Embeddings and Deep Learning Overview

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1. WordSpace: A basic embedding model

- Classical distributional semantics
- PPMI and normalization
- Limitations of distributional semantics
- Practice: Building a WordSpace model

2. Embeddings via matrix factorization

- From distributional semantics to embeddings
- Singular value decomposition
- Practice
 - word2vec I
 - Computing embeddings via matrix factorization

3. Deep learning I: Gradient descent

- Some machine learning basics
- Cost function, objective
- Gradient descent
- Practice: word2vec II

4. Embeddings via gradient descent

- Last part of lecture 3
- Gradient descent formalization of word2vec
- Practice: FastText

5. Deep learning II: Neural networks

- Multilayer perceptrons
- Limitations of multilayer perceptrons
- Convolutional neural networks (CNNs)
- Practice: Implementing and running CNNs

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- 3. Deep learning I: Gradient descent
- 4. Embeddings via gradient descent
- 5. Deep learning II: Neural networks