

# Neural Networks

- Catastrophic Interference in Neural Embedding Models (Dachapally & Jones)
- Querying word embeddings for word similarity and relatedness
- Multi-Task Deep Neural Networks for Natural Language Understanding

# Catastrophic Interference in Neural Embedding Models (Dachapally & Jones)

Catastrophic forgetting is the tendency of neural models to have a strong recency bias e.g. more recent training examples are more likely to be predicted.

## DSM

Distributional Semantic Models encompass geometric models like latent dirichlet allocation and svd as well as neural embedding models. Neural embedding models are

## Experiment 1

### Create artificial data

using the following sentence generation patterns

- "Man/woman catch/eat trout/bass"
- "Man/woman play/pluck acoustic/bass"

The idea is to capture the two homophonous meanings of 'bass' and place them in embedding contexts identical to that of a synonym.

# Ordering of data

## Balancing distribution of homophones

- Random sampling
- All 'fish' interpretations first
- All 'musical' interpretations first

## 1/3 of one meaning

## Evaluation

Looked at cosine similarity between word embedding vectors learned

## Experiment 2

Conducted using real data TASSA corpus

# Querying word embeddings for word similarity and relatedness

Word relatedness is sometimes asymmetrical e.g. stork may elicit associations with baby but baby may not generate associations with stork.

Similarity is symmetrical.

# Multi-Task Deep Neural Networks for Natural Language Understanding