

2013 - word2vec

Tomas Mikolov et al. publish four papers on vector representations of words constituting the *word2vec* framework

This received very much attention as it revolutionized the way words were encoded for deep learning models in the field of NLP.



2013

2013 - word2vec

Tomas Mikolov et al. publish four papers on vector representations of words constituting the *word2vec* framework.

This received very much attention as it revolutionized the way words were encoded for deep learning models in the field of NLP.

2013

2014

2014 - Attention!

The concept of Attention is introduced by **Bahdanau et al.** as a complement to state-of-the-art neural network architectures.

It is (at first) just used in conjunction with RNNs for machine translation, but will kick-start a completely new path of Deep learning research in NLP in the years to come.

2013 - word2vec

Tomas Mikolov et al. publish four papers on vector representations of words constituting the *word2vec* framework

This received very much attention as it revolutionized the way words were encoded for deep learning models in the field of NLP.

2016 - TPUs

Google developed a processing unit exceptionally suited for deep learning applications.

Its architecture is optimized for performing large matrix multiplications and perfectly integrated to their deep learning library *Tensorflow*.

2013

2014

2016

2014 - Attention!

The concept of Attention is introduced by **Bahdanau et al.** as a complement to state-of-the-art neural network architectures.

It is (at first) just used in conjunction with RNNs for machine translation, but will kick-start a completely new path of Deep learning research in NLP in the years to come.

2013 - word2vec

Tomas Mikolov et al. publish four papers on vector representations of words constituting the *word2vec* framework

This received very much attention as it revolutionized the way words were encoded for deep learning models in the field of NLP.

2016 - TPUs

Google developed a processing unit exceptionally suited for deep learning applications.

Its architecture is optimized for performing large matrix multiplications and perfectly integrated to their deep learning library *Tensorflow*.

2013

2014

2016

2017

2014 - Attention!

The concept of Attention is introduced by **Bahdanau et al.** as a complement to state-of-the-art neural network architectures.

It is (at first) just used in conjunction with RNNs for machine translation, but will kick-start a completely new path of Deep learning research in NLP in the years to come.

2017 - Attention is all you need!

With their *Transformer* architecture **Vaswani et al.** extend the concept of Attention as an additional building block of neural networks to a purely attention-based architecture.

These developments gave rise to faster (i.e. better parallelizable), bigger (up to billions of parameters) and better models for NLP.

2013 - word2vec

Tomas Mikolov et al. publish four papers on vector representations of words constituting the *word2vec* framework

This received very much attention as it revolutionized the way words were encoded for deep learning models in the field of NLP.

2013

2014

2014 - Attention!

The concept of Attention is introduced by **Bahdanau et al.** as a complement to state-of-the-art neural network architectures.

It is (at first) just used in conjunction with RNNs for machine translation, but will kick-start a completely new path of Deep learning research in NLP in the years to come.

2016 - TPUs

Google developed a processing unit exceptionally suited for deep learning applications.

Its architecture is optimized for performing large matrix multiplications and perfectly integrated to their deep learning library *Tensorflow*.

2016

2017

2017 - Attention is all you need!

With their *Transformer* architecture **Vaswani et al.** extend the concept of Attention as an additional building block of neural networks to a purely attention-based architecture.

These developments gave rise to faster (i.e. better parallelizable), bigger (up to billions of parameters) and better models for NLP.

2018 - BERT

BERT (**Devlin et al.**) is a bidirectional contextual embedding model ringing in the new era of transfer learning in NLP.

BERT (and its successors) rely on pre-training on huge unlabelled corpora of text and can afterwards be fine-tuned on many different NLP related tasks.

2018