BERT (**Devlin et al., 2018**) is a bidirectional contextual embedding model purely relying on Self-Attention by using multiple **Transformer encoder** blocks.

BERT (and its successors) rely on the **Masked Language Modelling objective** during pre-training on huge unlabelled corpora of text.

10/2018

BERT (**Devlin et al., 2018**) is a bidirectional contextual embedding model purely relying on Self-Attention by using multiple **Transformer encoder** blocks.

BERT (and its successors) rely on the **Masked Language Modelling objective** during pre-training on huge unlabelled corpora of text.

10/2018

02/2019

February 2019 - GPT2

Radford et al., 2019 massively scale up their GPT model from 2018 (up to 1.5 billion parameters). Despite the size, there are only smaller architectural changer, thus it remains a unidirectionally contextual model.

Controversial debate about this model, since OpenAI (at first) refuses to make their pre-trained architecture publicly available due to concerns about "malicious applications".

BERT (**Devlin et al., 2018**) is a bidirectional contextual embedding model purely relying on Self-Attention by using multiple **Transformer encoder** blocks.

BERT (and its successors) rely on the **Masked Language Modelling objective** during pre-training on huge unlabelled corpora of text.

June 2019 - XLNet

Yang et al., 2019 design a new pre-training objective in order to overcome some weaknesses they spotted in the one used by BERT.

The use **Permutation Language**| **Modelling** to avoid the discrepancy
| between pre-training and fine-tuning
| introduced by the artificial MASK
| token.

10/2018

02/2019

06/2019

February 2019 - GPT2

Radford et al., 2019 massively scale up their GPT model from 2018 (up to 1.5 billion parameters). Despite the size, there are only smaller architectural changer, thus it remains a unidirectionally contextual model.

Controversial debate about this model, since OpenAI (at first) refuses to make their pre-trained architecture publicly available due to concerns about "malicious applications".

BERT (**Devlin et al., 2018**) is a bidirectional contextual embedding model purely relying on Self-Attention by using multiple **Transformer encoder** blocks.

BERT (and its successors) rely on the **Masked Language Modelling objective** during pre-training on huge unlabelled corpora of text.

June 2019 - XLNet

I Yang et al., 2019 design a new pre-training objective in order to overcome some weaknesses they spotted in the one used by BERT.

The use **Permutation Language**| **Modelling** to avoid the discrepancy
| between pre-training and fine-tuning
| introduced by the artificial MASK
| token.

10/2018

02/2019

06/2019 10/2019

February 2019 - GPT2

Radford et al., 2019 massively scale up their GPT model from 2018 (up to 1.5 billion parameters). Despite the size, there are only smaller architectural changer, thus it remains a unidirectionally contextual model.

Controversial debate about this model, since OpenAI (at first) refuses to make their pre-trained architecture publicly available due to concerns about "malicious applications".

October 2019 - T5

T5 (Raffel et al., 2019) a complete encoder-decoder Transformer based architecture (text-to-text transfer transformer).

They approach transfer learning by transforming all inputs as well as all outputs to strings and fine-tuned their model simultaneously on data sets with multiple different tasks.

BERT (**Devlin et al., 2018**) is a bidirectional contextual embedding model purely relying on Self-Attention by using multiple **Transformer encoder** blocks.

BERT (and its successors) rely on the **Masked Language Modelling objective** during pre-training on huge unlabelled corpora of text.

! June 2019 - XLNet

I Yang et al., 2019 design a new I pre-training objective in order to overcome some weaknesses they spotted in the one used by BERT.

The use **Permutation Language**| **Modelling** to avoid the discrepancy
| between pre-training and fine-tuning
| introduced by the artificial MASK
| token.

March 2020 - ELECTRA

I ELECTRA (Clark et al., 2020)
I introduces a discriminative preI training strategy, allowing for a
I more efficient use of the
I pre-training corpus.

Despite requiring two models, the computational costs, for achieving a similar performance, are reduced to this gain in efficiency.

10/2018

02/2019

06/2019

10/2019 03/2020

February 2019 - GPT2

Radford et al., 2019 massively scale up their GPT model from 2018 (up to 1.5 billion parameters). Despite the size, there are only smaller architectural changer, thus it remains a unidirectionally contextual model.

Controversial debate about this model, since OpenAI (at first) refuses to make their pre-trained architecture publicly available due to concerns about "malicious applications".

October 2019 - T5

T5 (Raffel et al., 2019) a complete encoder-decoder Transformer based architecture (text-to-text transfer transformer).

They approach transfer learning by transforming all inputs as well as all outputs to strings and fine-tuned their model simultaneously on data sets with multiple different tasks.