

Package ‘transformer’

July 22, 2025

Title Implementation of Transformer Deep Neural Network with Vignettes

Version 0.2.0

Description Transformer is a Deep Neural Network Architecture based i.a. on the Attention mechanism (Vaswani et al. (2017) <[doi:10.48550/arXiv.1706.03762](https://doi.org/10.48550/arXiv.1706.03762)>).

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Encoding UTF-8

RoxygenNote 7.2.3

Imports attention (>= 0.4.0)

Suggests covr, testthat (>= 3.0.0)

Config/testthat/edition 3

NeedsCompilation no

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feed_forward	<i>Feed Forward Layer</i>
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Description

Feed Forward Layer

Usage

```
feed_forward(x, dff, d_model)
```

Arguments

x	inputs
dff	dimensions of feed-forward model
d_model	dimensions of the model

Value

output of the feed-forward layer

layer_norm	<i>Layer Normalization</i>
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Description

Layer Normalization

Usage

```
layer_norm(x, epsilon = 1e-06)
```

Arguments

x	inputs
epsilon	scale

Value

outputs of layer normalization

multi_head	<i>Multi-Headed Attention</i>
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Description

Multi-Headed Attention

Usage

```
multi_head(Q, K, V, d_model, num_heads, mask = NULL)
```

Arguments

Q	queries
K	keys
V	values
d_model	dimensions of the model
num_heads	number of heads
mask	optional mask

Value

multi-headed attention outputs

row_means	<i>Row Means</i>
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Description

Row Means

Usage

```
row_means(x)
```

Arguments

x	matrix
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Value

vector with the mean of each of row of the input matrix

Examples

```
row_means(t(matrix(1:5)))
```

row_vars	<i>Row Variances</i>
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Description

Row Variances

Usage

row_vars(x)

Arguments

x matrix

Value

vector with the variance of each of row of the input matrix

Examples

row_vars(t(matrix(1:5)))

transformer	<i>Transformer</i>
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Description

Transformer

Usage

transformer(x, d_model, num_heads, dff, mask = NULL)

Arguments

x inputs
d_model dimensions of the model
num_heads number of heads
dff dimensions of feed-forward model
mask optional mask

Value

output of the transformer layer

Examples

```
x <- matrix(rnorm(50 * 512), 50, 512)
d_model <- 512
num_heads <- 8
dff <- 2048

output <- transformer(x, d_model, num_heads, dff)
```

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