Package: transformer (via r-universe)

September 5, 2024

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>).

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Encoding UTF-8

Roxygen list(markdown = TRUE)

RoxygenNote 7.2.3

Imports attention (>= 0.4.0)

Suggests covr, testthat (>= 3.0.0)

Config/testthat/edition 3

Repository https://bquast.r-universe.dev

RemoteUrl https://github.com/bquast/transformer

RemoteRef HEAD

RemoteSha 5da363dfa2558bbafa7ac264dcc6e9846bf84c63

Contents

feed_forward *Feed Forward Layer*

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 *Layer Normalization*

Description

Layer Normalization

Usage

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

Arguments

x	inputs
epsilon	scale

Value

outputs of layer normalization

`multi_head` *Multi-Headed Attention*

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` *Row Means*

Description

Row Means

Usage

```
row_means(x)
```

Arguments

`x`	matrix

Value

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

Examples

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

row_vars *Row Variances*

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 *Transformer*

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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