Interpretable representation spaces for time series

A Preprint

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Abstract

In some machine learning applications it is essential for models to provide interpretable predictions. In domains such as computer vision and natural language processing, there are algorithms for disentanglement of hidden states. Disentangled representations of hidden states contain human-interpretable information about objects, making it easier to describe model predictions using only these representations.

In this paper, we introduce an efficient pipeline for generating interpretable representations from multidimensional time series data. Unlike other disentanglement algorithms for sequential data, the proposed method creates a single constant-dimensional representation for the entire sequence of measurements. This approach enables global changes to time series to be made in a controlled manner, offering greater flexibility and interpretability.

Keywords Few keywords here

1 Introduction

2 Headings: first level

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2.1 Headings: second level

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$$\xi_{ij}(t) = P(x_t = i, x_{t+1} = j | y, v, w; \theta) = \frac{\alpha_i(t) a_{ij}^{w_t} \beta_j(t+1) b_j^{v_{t+1}}(y_{t+1})}{\sum_{i=1}^{N} \sum_{j=1}^{N} \alpha_i(t) a_{ij}^{w_t} \beta_j(t+1) b_j^{v_{t+1}}(y_{t+1})} \tag{1}$$

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*Use footnote for providing further information about author (webpage, alternative address)—not for acknowledging funding agencies.

2.1.1 Headings: third level

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3 Examples of citations, figures, tables, references

3.1 Citations

Citations use `natbib`. The documentation may be found at

http://mirrors.ctan.org/macros/latex/contrib/natbib/natnotes.pdf

Here is an example usage of the two main commands (`citet` and `citep`): Some people thought a thing [??] but other people thought something else [?]. Many people have speculated that if we knew exactly why ? thought this...

3.2 Figures

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3.3 Tables

See awesome Table 1.

The documentation for `booktabs` ('Publication quality tables in LaTeX') is available from:

https://www.ctan.org/pkg/booktabs

3.4 Lists

- Lorem ipsum dolor sit amet
- consectetur adipiscing elit.
- Aliquam dignissim blandit est, in dictum tortor gravida eget. In ac rutrum magna.

Список литературы

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[2] Sample of the first footnote.

../figures/log_reg_cs_exp-eps-converted-to.pdf

Рис. 1: Sample figure caption.

Таблица 1: Sample table title

Part		
Name	Description	Size (μm)
Dendrite	Input terminal	$\sim$100
Axon	Output terminal	$\sim$10
Soma	Cell body	up to 10^6