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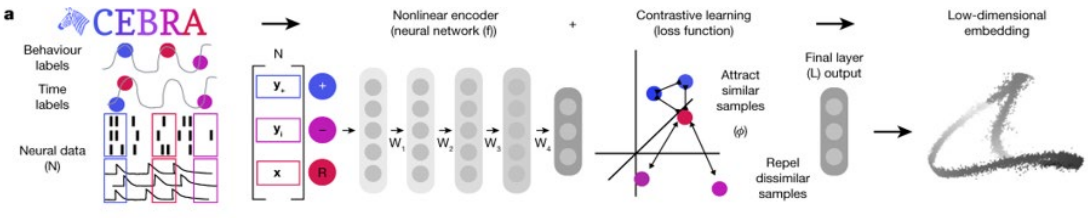
Licensing Opportunity

TTO – Technology Transfer Office

Dimensionality Reduction of Time-Series Data using Contrastive Learning (CEBRA)



CEBRA allows for self-supervised, supervised and hybrid approaches for both hypothesis-and discovery-driven analysis. Overview of pipeline: collect data (for example, pairs of behaviour (or time) and neural data (x,y)), determine positive and negative pairs, train CEBRA and produce embeddings. W1,...4 represent the neural network weights.

Ref. Nr

6.2273

Keywords

CEBRA, brain-machine interface, BCI, neural decoding,embedding, AI

Intellectual Property

US 12,499,131B2

Publications

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Description

Current methods do not allow to extract meaningful patterns from high-dimensional time-series data (e.g., neural signals, sensor streams, behavioral recordings)as the number of variables (dimensions) increases, and the relationships are non-linear.

This technology relates to a self-supervised encoding method for dimensionality reduction of time-series data, leveraging contrastive learning techniques. It enables efficient transformation of multidimensional temporal datasets into a latent embedding preserving essential patterns and relationships.

Advantages

- Enables latent embeddings that are robust to noise, temporal distortions, and sampling variability; ¨
- Reduced dependence on labeled datasets; Superior performance over linear and reconstruction-based methods;
- Robustness to domain shifts.

Applications

- brain-machine interface and neural decoding
- Mapping/modelling behavioural action to neural activity
- kinematics