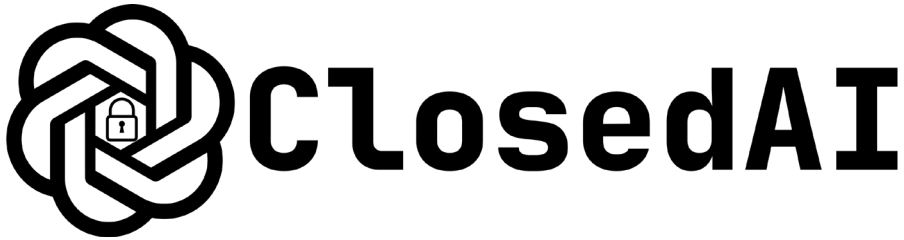
Machine Learning course 2023. Final Project 11.



Contrastive Learning for Event Sequences with Self-Supervision on multiple domains

Replication study

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Irena Gureeva Mikhail Konenkov

Motivation

Learning best algorithms for lifestream data embeddings

Extracting embeddings from event sequences is a useful approach that can be used for learning users preferences, advising customers products based on their clickstream data and many other real-world applications. However, classical methods for analyzing event sequences that are attributed to a person and capture their regular and routine behavior do not capture relationships between single object and its immediate neighborhood very well. Also, it usually requires a labeled data to operate this.
Therefore, new methods for data augmentation and event sequences extraction is needed.

Related work

CoLES: Contrastive Learning for Event Sequences with Self-Supervision

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The paper on which our replication study is based on.

Event sequence metric learning

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Metric learning method for producing embeddings of complex event sequences. The main advantage is that almost no pre-processing is needed for complex even streams to get their compact embedding.

Attributed Sequence Embedding

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Study about extracting data embeddings from attributed sequences.

A Framework For Contrastive Self-Supervised Learning And Designing A New Approach

Technical Report

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Study with analysis of contrastive learning approaches and conceptual framework for Contrastive Learning.

CoLES framework

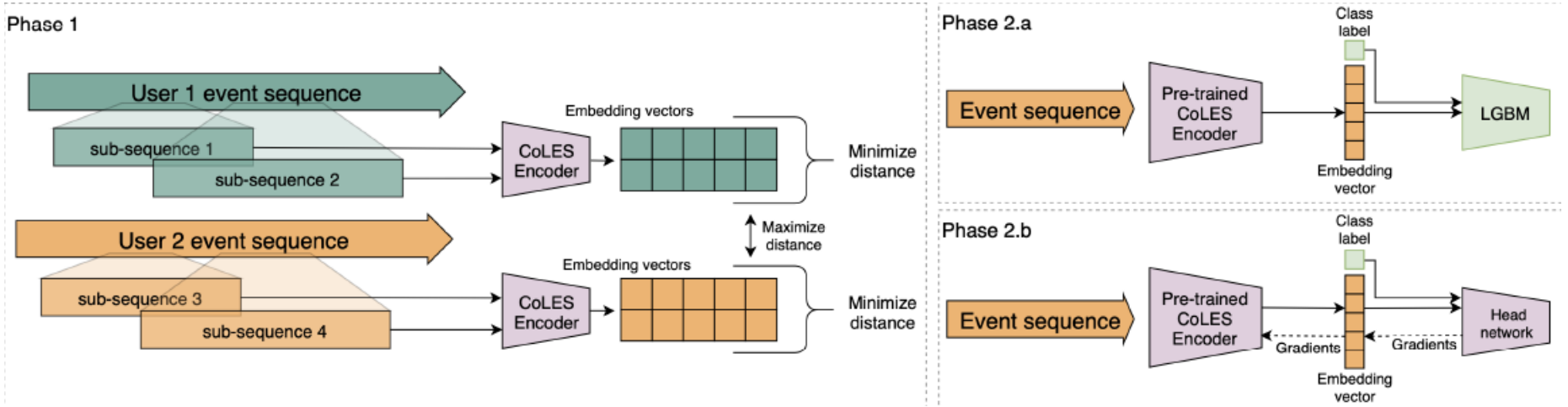

Figure 1: General framework. Phase 1: Self-supervised training. Phase 2.a Self-supervised embeddings as features for supervised model. Phase 2.b: Pre-trained encoder fine-tuning.

DataFusion 2022 datasets

ClosedAI

Hyperparameters

Conducted Experiments

Analyzed methods

ClosedAI

Skoltech

General pipeline

Transactions

Clickstreams. PySpark

ClosedAI

Results

Results

Contribution

Conclusion