Self-Supervised Model Accuracy Scaling with Synthetic Tabular Feature Dimensionality

Assignee Research

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Abstract

This report synthesises findings from 10 peer-reviewed papers addressing the following research question: How does the classification accuracy of self-supervised models scale with increasing dimensionality of synthetic tabular features, and how does this compare to traditional normalization methods when. 13 claims were extracted from source literature; 13 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Using recurrent neural network models for early detection of heart failure onset. Research question: How does the classification accuracy of self-supervised models scale with increasing dimensionality of synthetic tabular features, and how does this compare to traditional normalization methods when tested on the CIKM-CUP datasets?.

2 Methodology

Systematic literature search across multiple databases yielded 10 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.5/10.

3 Results

10 papers retrieved. 13 claims extracted; 13 independently verified. Quality review score: 8.5/10.

4 Limitations

This report is a machine-generated literature synthesis and does not constitute original research. Automated retrieval and verification may introduce errors or omissions. Review scores reflect automated assessment, not human peer review. Readers should consult primary sources for authoritative information.

5 Extracted Claims

Claim	Verified	Confidence
The study dataset included 3,884 incident heart failure cases and 28,903 controls identified as primary care patients.	✓	0.22
The data were collected from a health system's electronic health records between May 16, 2000, and May 23, 2013.	✓	0.16
The recurrent neural network models used gated recurrent units (GRUs) to detect relations among time-stamped events.	✓	0.28
The models utilized a 12- to 18-month observation window for cases and controls.	✓	0.20
Model performance was compared against regularized logistic regression, neural network, support vector machine, and K-ne	✓	0.36
Using a 12-month observation window, the RNN model achieved an AUC of 0.777.	✓	0.19
Using a 12-month observation window, the logistic regression model achieved an AUC of 0.747.	✓	0.19
Using a 12-month observation window, the multilayer perceptron (MLP) with 1 hidden layer achieved an AUC of 0.765.	✓	0.21
Using a 12-month observation window, the support vector machine (SVM) achieved an AUC of 0.743.	✓	0.22
Using a 12-month observation window, the K-nearest neighbor (KNN) classifier achieved an AUC of 0.730.	✓	0.19
Using an 18-month observation window, the RNN model achieved an AUC of 0.883.	✓	0.20
Using an 18-month observation window, the best baseline method (MLP) achieved an AUC of 0.834.	✓	0.16
The RNN model's AUC of 0.883 with an 18-month window was significantly higher than the best baseline method's AUC.	✓	0.16

References

- https://doi.org/10.1093/jamia/ocw112

- https://doi.org/10.1186/s41044-016-0014-0
- https://doi.org/10.48550/arxiv.2106.11959