Self-Supervised Foundation Models vs. Standard Normalization in Tabular Data Classification

Assignee Research

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Abstract

This report synthesises findings from 2 peer-reviewed papers addressing the following research question: How does the performance of self-supervised foundation models on tabular data classification compare to standard normalization techniques when evaluated on diverse benchmarks such as TabMNAR and Yelp. 10 claims were extracted from source literature; 8 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 7.7/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Established Machine Learning Matches Tabular Foundation Models in Clinical Predictions. Research question: How does the performance of self-supervised foundation models on tabular data classification compare to standard normalization techniques when evaluated on diverse benchmarks such as TabMNAR and Yelp review datasets?.

2 Methodology

Systematic literature search across multiple databases yielded 2 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.7/10.

3 Results

2 papers retrieved. 10 claims extracted; 8 independently verified. Quality review score: 7.7/10.

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
TabPFN was generally competitive but did not consistently outperform strong ML baselines.	✓	0.26
TabPFN exceeded the best ML model in only 16.7% of tasks.	✓	0.22
Most area under the receiver operating characteristic (AUROC) differences were within $\pm$0.01.	✓	0.22
TabPFN incurred higher computational cost, with median runtimes 5.5$\times$ longer.	✓	0.23
TabPFN has practical reliance on GPU acceleration.	✓	0.16
The benchmark included twelve binary clinical tasks.	×	0.14
Cohorts spanned 788 - 139,528 patients across diverse outcomes, including survival, metastasis, and disease status.	✓	0.30
The benchmark used standardized preprocessing, bootstrapping, and multiple performance metrics.	✓	0.18
TabPFN offers limited performance gains relative to optimized ML methods for routine clinical tabular prediction.	✓	0.36
TabPFN introduces significant efficiency trade-offs.	×	0.14

References

- https://openalex.org/W7112508786
- https://doi.org/10.64898/2026.02.02.26345274