

# Effect of Feature Dimensionality on Contrastive Pretraining in Tabular Foundation Models

Assignee Research

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## Abstract

This report synthesises findings from 12 peer-reviewed papers addressing the following research question: What is the effect of varying the feature dimensionality in synthetic datasets on the contrastive pretraining performance of tabular foundation models measured by TabLAM accuracy. 14 claims were extracted from source literature; 1 was independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 4.1/10. This report is a machine-generated literature synthesis and does not constitute original research.

## 1 Introduction

This paper examines: Pretraining Strategies and Scaling for ECG Foundation Models: A Systematic Study. Research question: What is the effect of varying the feature dimensionality in synthetic datasets on the contrastive pretraining performance of tabular foundation models measured by TabLAM accuracy?.

## 2 Methodology

Systematic literature search across multiple databases yielded 12 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 4.1/10.

## 3 Results

12 papers retrieved. 14 claims extracted; 1 independently verified. Quality review score: 4.1/10.

## 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 covers five different pretraining methodologies.	×	0.12
The pretraining corpus used comprises over 11 million samples.	×	0.05
State space models (SSMs) are the superior architecture choice across all pretraining paradigms compared to CNNs and Tra	×	0.10
CPC shows the strongest and most transferable representations across diverse clinical tasks among the five methodologies	×	0.12
data2vec consistently lags behind other methodologies across all evaluation modes and scaling regimes.	×	0.04
Scaling behavior is most clearly identified for CPC and JEPA methodologies.	×	0.09
Lower pretraining loss correlates with small residual errors in downstream tasks.	×	0.04
The S4 backbone with model dimension 512 consistently outperforms larger and alternative configurations in ablation stud	×	0.02
The default backbone adopted is a 4-layer S4 with dimension 512.	×	0.00
All models operate at 240 Hz on 12-lead ECG inputs.	×	0.04
The CNN stem consists of four convolutional layers with batch normalization.	×	0.04
The Transformer backbone uses RoPE positional encoding and GELU activations.	×	0.00
Recent ECG foundation models have been pre-trained on tens of millions of recordings.	×	0.11
Structured state space models have shown superior performance on long sequences in supervised ECG settings compared to t	✓	0.15

## References

- <http://arxiv.org/abs/2504.20900v1>
- <http://arxiv.org/abs/2512.03307v1>
- <http://arxiv.org/abs/2605.12241v1>