

Clinically-Guided Contrastive Pretraining and Zero-Shot ECG Transfer Performance

Assignee Research

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Abstract

This report synthesises findings from 15 peer-reviewed papers addressing the following research question: What is the impact of varying the number of negative samples in contrastive pretraining on the zero-shot transferability of ECG foundation models to unseen datasets, evaluated using Spearman. 10 claims were extracted from source literature; 1 was independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 4.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: CLEF: Clinically-Guided Contrastive Learning for Electrocardiogram Foundation Models. Research question: What is the impact of varying the number of negative samples in contrastive pretraining on the zero-shot transferability of ECG foundation models to unseen datasets, evaluated using Spearman correlation with clinical scores?.

2 Methodology

Systematic literature search across multiple databases yielded 15 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 4.5/10.

3 Results

15 papers retrieved. 10 claims extracted; 1 independently verified. Quality review score: 4.5/10.

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
CLEF-M achieves an AUROC of 0.8194 on downstream classification tasks.	×	0.09
MOCO (2020) achieves an AUROC of 0.8112 on downstream classification tasks.	×	0.04
SimCLR (2020) achieves an AUROC of 0.8243 on downstream classification tasks.	×	0.04
BYOL (2020) achieves an AUROC of 0.8221 on downstream classification tasks.	×	0.04
The negative weighting loss (Lw) and dissimilarity alignment loss (Ld) are key components of CLEF's framework.	×	0.07
CLEF's framework uses clinically-guided contrastive pretraining.	✓	0.16
Contrastive learning for images is guided by spatial proximity of image viewpoints or content, or by sample identities.	×	0.07
Prior work incorporates subject and signal attributes in contrastive learning but did not incorporate clinical knowledge	×	0.11
Metadata recorded alongside ECGs, such as patient demographics, provides a potential source of contextual data.	×	0.04
Risk scores estimate a person's risk of experiencing an adverse health outcome in a specified time period.	×	0.03

References

- <http://arxiv.org/abs/2512.02180v1>
- <http://arxiv.org/abs/2103.12676v2>
- <http://arxiv.org/abs/2605.12241v1>