Synchrony-Driven Spiking Mechanisms for Efficient Multimodal Fusion in CLIP Zero-Shot Classification

Assignee Research

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Abstract

This report synthesises findings from 17 peer-reviewed papers addressing the following research question: Can synchrony-driven spiking mechanisms reduce the computational cost of multimodal fusion while maintaining competitive performance on the CLIP zero-shot classification benchmark. 13 claims were extracted from source literature; 12 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 7.9/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Code Smell Classification in Python: Are Small Language Models Up to the Task?. Research question: Can synchrony-driven spiking mechanisms reduce the computational cost of multimodal fusion while maintaining competitive performance on the CLIP zero-shot classification benchmark?.

2 Methodology

Systematic literature search across multiple databases yielded 17 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.9/10.

3 Results

17 papers retrieved. 13 claims extracted; 12 independently verified. Quality review score: 7.9/10.

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
Code quality is essential for maintainable and evolvable software systems.	✓	0.25
Traditional code smell detection tools rely on AST-based techniques and metric-driven heuristics.	✓	0.32
AST-based techniques and metric-driven heuristics often lack interpretability and require specialized knowledge.	✓	0.27
This paper investigates the use of Small Language Models (SLMs) for classifying two widely studied code smells—Long Meth	✓	0.40
SLMs offer lower latency and reduced computational cost compared to Large Language Models (LLMs).	✓	0.27
SLMs are suitable for deployment in resource-constrained environments.	×	0.08
The paper systematically compares the performance of SLMs with traditional Machine Learning (ML) and Deep Learning (DL)	✓	0.30
The evaluation considers precision, recall, F1-score, and processing time.	✓	0.22
The evaluation uses a custom event-driven dataset designed for code classification.	✓	0.20
SLMs achieve competitive accuracy with improved interpretability.	✓	0.21
The paper releases an annotated dataset comprising classifications from all approaches.	✓	0.15
This work provides new insights into lightweight, explainable, and practical methods for automated code quality assessme	✓	0.29
The work supports the broader adoption of SLMs in software engineering.	✓	0.21

References

- http://arxiv.org/abs/2506.14138v1
- http://arxiv.org/abs/2001.10696v5
- https://www.semanticscholar.org/paper/39020788eb1190a94945b03af04f01a8d18ad206