Small Language Models vs. Domain-Adapted Models in Multimodal CWE Detection

Assignee Research

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Abstract

This report synthesises findings from 13 peer-reviewed papers addressing the following research question: What is the accuracy difference between SLMs and domain-adapted models on a multimodal benchmark (e.g., combining code and natural language descriptions) for CWE detection, and how does this vary. Building models that can be rapidly adapted to novel tasks using only a handful of annotated examples is an open challenge for multimodal machine learning research. We introduce Flamingo, a family of Visual Language Models (VLM) with this ability. 11 claims were extracted from source literature; 9 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: Flamingo: a Visual Language Model for Few-Shot Learning. Research question: What is the accuracy difference between SLMs and domain-adapted models on a multimodal benchmark (e.g., combining code and natural language descriptions) for CWE detection, and how does this vary with adversarial perturbations?.

2 Methodology

Systematic literature search across multiple databases yielded 13 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

13 papers retrieved. 11 claims extracted; 9 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
Flamingo is a family of Visual Language Models (VLM) designed for few-shot learning.	✓	0.24
Flamingo's architecture bridges powerful pre-trained vision-only and language-only models.	×	0.14
Flamingo can handle sequences of arbitrarily interleaved visual and textual data.	✓	0.24
Flamingo can seamlessly ingest images or videos as inputs.	✓	0.18
Flamingo models are trained on large-scale multimodal web corpora containing arbitrarily interleaved text and images.	✓	0.31
Flamingo models possess in-context few-shot learning capabilities.	✓	0.17
Flamingo was evaluated on open-ended visual question-answering tasks.	✓	0.23
Flamingo was evaluated on captioning tasks.	×	0.09
Flamingo was evaluated on close-ended multiple-choice visual question-answering tasks.	✓	0.25
A single Flamingo model achieves a new state of the art in few-shot learning across various image and video tasks by pro	✓	0.28
On numerous benchmarks, Flamingo outperforms models fine-tuned on thousands of times more task-specific data.	✓	0.29

References

- https://doi.org/10.3390/computation13020030
- https://doi.org/10.48550/arxiv.2204.14198
- https://doi.org/10.48550/arxiv.2307.03109