

Procedural Pretraining on MBPP Enhances CodeT5 Robustness Against Adversarial Perturbations

Assignee Research

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Abstract

This report synthesises findings from 15 peer-reviewed papers addressing the following research question: Does procedural pretraining on the MBPP dataset improve CodeT5's robustness against adversarial perturbations compared to instruction-tuned models like CodeLlama, measured by accuracy drop under. 8 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: Procedural Pretraining: Warming Up Language Models with Abstract Data. Research question: Does procedural pretraining on the MBPP dataset improve CodeT5's robustness against adversarial perturbations compared to instruction-tuned models like CodeLlama, measured by accuracy drop under synthetic code perturbations?.

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. 8 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
Procedural pretraining improves performance and accelerates language model pretraining.	×	0.08
Procedural pretraining can be complementary to standard pretraining datasets, improving performance with as little as 0.	×	0.09
Procedural data enables models to reach the same loss with 55% of the original data on C4, 67% on CODEPARROT, and 86% on	✓	0.22
Procedural pretraining gains persist on downstream language, code generation, and common-sense reasoning tasks.	×	0.10
Different types of procedural pretraining facilitate learning different algorithmic skills.	×	0.10
Procedural pretraining improves accuracy on tasks such as HAYSTACK, ADDITION, REVERSED ADDITION, MULTIPLICATION, and SOR	×	0.05
The best model for HAYSTACK is 16 DYCK, for ADDITION is 16 DYCK, for REVERSED ADDITION is 16 DYCK, for MULTIPLICATION is	×	0.03
Shuffling the sequences of procedural data reduces performance, indicating the importance of sequence order in procedura	×	0.09

References

- <http://arxiv.org/abs/2103.15670v3>
- <http://arxiv.org/abs/2601.21725v2>
- <http://arxiv.org/abs/2007.08428v4>