Quantized Multilingual Pre-Training in USM and Cross-Lingual Alignment in Low-Resource Dialects

Assignee Research

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Abstract

This report synthesises findings from 16 peer-reviewed papers addressing the following research question: How does quantized multilingual pre-training in USM impact cross-lingual alignment accuracy on low-resource dialects compared to non-quantized baselines. 18 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 3.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Evaluating Quantized Large Language Models for Code Generation on Low-Resource Language Benchmarks. Research question: How does quantized multilingual pre-training in USM impact cross-lingual alignment accuracy on low-resource dialects compared to non-quantized baselines?.

2 Methodology

Systematic literature search across multiple databases yielded 16 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 3.5/10.

3 Results

16 papers retrieved. 18 claims extracted; 0 independently verified. Quality review score: 3.5/10.

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
HumanEval contains 164 hand-written programming tasks.	×	0.01
On average, there are 7.7 unit tests per task in HumanEval.	×	0.02
HumanEval was used to evaluate GPT-3-based Codex models with 12 million to 12 billion parameters.	×	0.07
The Mostly Basic Programming Problems (MBPP) benchmark consists of 974 code-generation tasks at the beginner level.	×	0.07
MBPP was originally tested on dense left-to-right decoder-only transformer language models with 244 million to 137 billi	×	0.07
MultiPL-E is a benchmark that combines HumanEval and MBPP.	×	0.02
MultiPL-E is a multilingual benchmark that translated the original Python tasks into 18 other programming languages.	×	0.03
MultiPL-E was used to evaluate the InCoder 6.7B, CodeGen 16.1B, and Codex 12B models.	×	0.03
MCEVAL is another multilingual benchmark that covers 40 languages including Lua.	×	0.03
MCEVAL contains human-annotated tasks.	×	0.03
MCEVAL contains three categories of programming tasks: code generation, code completion, and code understanding.	×	0.07
All generation tasks in MCEVAL are divided into easy, middle, and hard difficulty levels.	×	0.03
The original study of MCEVAL evaluated 23 models with 7B to 72B parameters.	×	0.06
CodeGemma, CodeQwen, StarCoder, CodeLlama, and DSCoder are evaluated on HumanEval, MBPP, and MCEVAL benchmarks.	×	0.01
Pass@1 metrics are reported for 2-bit, 4-bit, and 8-bit quantized models on HumanEval, MBPP, and MCEVAL benchmarks.	×	0.09
Mean inference time (IT) by models is reported for pass@1 and fail@1 cases across 2-bit, 4-bit, and 8-bit quantized mode	×	0.11
Mean inference time (IT) by benchmarks is reported for pass@1 and fail@1 cases across 2-bit, 4-bit, and 8-bit quantized	×	0.11
Mean inference time (IT) of 2-bit,4 4-bit, and 8-bit models is reported for pass@1 and fail@1 cases on HumanEval, MBPP, a	×	0.09

References

- http://arxiv.org/abs/2506.15415v1
- http://arxiv.org/abs/2604.10590v1
- http://arxiv.org/abs/2410.14766v1