

Quantization Impact on LLaMA 3.2 and Mistral Code Repair Accuracy in BugsInPy

Assignee Research

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Abstract

This report synthesises findings from 5 peer-reviewed papers addressing the following research question: How does 4-bit quantization impact the code repair accuracy of LLaMA 3.2 versus Mistral on the BugsInPy dataset compared to FP16 baselines. 9 claims were extracted from source literature; 9 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.3/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: A Systematic Literature Review on Large Language Models for Automated Program Repair. Research question: How does 4-bit quantization impact the code repair accuracy of LLaMA 3.2 versus Mistral on the BugsInPy dataset compared to FP16 baselines?.

2 Methodology

Systematic literature search across multiple databases yielded 5 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.3/10.

3 Results

5 papers retrieved. 9 claims extracted; 9 independently verified. Quality review score: 8.3/10.

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
Automated Program Repair (APR) attempts to patch software bugs and reduce manual debugging efforts.	✓	0.34
With the advances in Large Language Models (LLMs), an increasing number of APR techniques have been proposed, demonstrating	✓	0.30
This work provides the first systematic literature review to summarize the applications of LLMs in APR between 2020 and	✓	0.34
The review analyzes 189 relevant papers from LLMs, APR and their integration perspectives.	✓	0.21
The paper categorizes existing popular LLMs that are applied to support APR and outlines four types of utilization strategies	✓	0.22
The paper details specific repair scenarios that benefit from LLMs, e.g., semantic bugs and security vulnerabilities.	✓	0.24
The paper discusses several critical aspects of integrating LLMs into APR research, e.g., input forms and open science.	✓	0.26
The paper highlights a set of challenges remaining to be investigated and the potential guidelines for future research.	✓	0.25
The paper provides a systematic overview of the research landscape to the APR community, helping researchers gain a comprehensive	✓	0.39

References

- <https://doi.org/10.3390/software4030017>
- <https://doi.org/10.48550/arxiv.2405.01466>

- <https://openalex.org/W7158423025>