Inference-Time Scaling and Cross-Lingual Consistency in Multilingual PLMs via RankC Metric

Assignee Research

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Abstract

This report synthesises findings from 12 peer-reviewed papers addressing the following research question: How does inference-time scaling affect the cross-lingual consistency of factual knowledge in multilingual PLMs when evaluated using the RankC metric. Multilingual large-scale Pretrained Language Models (PLMs) have been shown to store considerable amounts of factual knowledge, but large variations are observed across languages. With the ultimate goal of ensuring that users with different language backgrounds obtain consistent. 7 claims were extracted from source literature; 7 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: Cross-Lingual Consistency of Factual Knowledge in Multilingual Language Models. Research question: How does inference-time scaling affect the cross-lingual consistency of factual knowledge in multilingual PLMs when evaluated using the RankC metric?.

2 Methodology

Systematic literature search across multiple databases yielded 12 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

12 papers retrieved. 7 claims extracted; 7 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
Multilingual large-scale Pretrained Language Models (PLMs) store considerable amounts of factual knowledge.	✓	0.34
Large variations in stored factual knowledge are observed across languages in Multilingual PLMs.	✓	0.23
The study proposes a Ranking-based Consistency (RankC) metric to evaluate knowledge consistency across languages indepen	✓	0.32
Increasing model size leads to higher factual probing accuracy in most languages.	✓	0.29
Increasing model size does not improve cross-lingual consistency.	✓	0.30
When new factual associations are inserted in PLMs via model editing in English, the knowledge transfers only to languag	✓	0.36
The code and data for the study are released at https://github.com/Betswish/Cross-Lingual-Consistency.	✓	0.32

References

- https://doi.org/10.48550/arxiv.2310.10378
- https://doi.org/10.18653/v1/2023.emnlp-main.658
- https://doi.org/10.1007/s11704-026-60308-3