Reproducibility Meta-Analysis of Divergent Llama-3 Belebele Performance Attributed to Model Checkpoints and Evaluation Protocols

Assignee Research

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Abstract

User-generated content (UGC) on social media can act as a key source of information for emergency responders in crisis situations. However, due to the volume concerned, computational techniques are needed to effectively filter and prioritise this content as it arises during emerging events. In the literature, these techniques are trained using annotated content from previous crises. In this paper, we investigate how this prior knowledge can be best leveraged for new crises by examining the extent to which crisis events of a similar type are more suitable for adaptation to new events (cross-dom

1 Introduction

This paper examines: Crisis Domain Adaptation Using Sequence-to-sequence Transformers. Research question: Reproducibility meta-analysis: 2 independent publications report divergent Llama-3 performance on Belebele with a 54.2 percentage-point spread (range 35.8%–90.0%). Source papers: "Zero-Shot Cross-Lingual Transfer using Prefix-Based Adaptation" (2025, 35.8%); "AraDiCE: Benchmarks for Dialectal and Cultural Capabilities in LLMs" (2024, 90.0%). Preliminary analysis suggests: The discrepancy likely stems from the use of different model checkpoints, where the 90.0% score reflects a fine-tuned or dialect-specific variant optimized for Arabic capabilities in AraDiCE, while the 35.8% result corresponds to a base Llama-3 model evaluated under strict zero-shot cross-lingual conditions without ta\ldots{} Systematically evaluate which evaluation protocol factors (model configuration, inference setup, quantization, tokenization, few-shot count, metric interpretation, or data-split selection) best explain the observed spread; identify the highest-confidence explanation supported by each paper's stated methodology; and assess whether the highest-reported score is reproducible under the conditions described by the lowest-reporting paper..

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 7.7/10.

3 Results

16 papers retrieved. 10 claims extracted; 8 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
The nepal_queensland dataset consists of two crisis events: Nepal Earthquake and Queensland Floods.	✓	0.27
The samples of the nepal_queensland dataset are tweets related to the two events and each tweet is annotated by two well	✓	0.27
The CrisisT6 dataset is a collection of approximately 60,000 tweets posted during six crisis events with approximately 1	✓	0.49
Each tweet in each event of the CrisisT6 dataset is labeled with two classes: on-topic and off-topic.	✓	0.18
The standard scenario for training represents common practice in the literature for fine-tuning seq2seq transformers on	×	0.10
The standard scenario is used as a strong baseline in the experiments due to its state of the art performance on text cl	×	0.07
A seq2seq model consists of an encoder and decoder.	✓	0.21
The encoder learns to encode an input example to a vector that can represent the contextualised linguistic features of t	✓	0.29
The decoder learns to generate the prediction words iteratively, conditional on the input representation.	✓	0.27
The model is trained with the objective function defined as minimizing the cross entropy loss between the ground truth t	✓	0.29

References

- http://arxiv.org/abs/2110.08015v1
- http://arxiv.org/abs/2408.11848v2
- http://arxiv.org/abs/2605.06359v1