

Cross-Lingual Transfer Effects of LoRA Initialization on Safety Alignment in Yoruba, Hausa, Igbo, and Igala via LSR Dual-Probe

Assignee Research

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Abstract

Safety alignment in large language models relies predominantly on English-language training data. When harmful intent is expressed in low-resource languages, refusal mechanisms that hold in English frequently fail to activate. We introduce LSR (Linguistic Safety Robustness), the first systematic benchmark for measuring cross-lingual refusal degradation in West African languages: Yoruba, Hausa, Igbo, and Igala. LSR uses a dual-probe evaluation protocol - submitting matched English and target-language probes to the same model - and introduces Refusal Centroid Drift (RCD), a metric that quantifies

1 Introduction

This paper examines: LSR: Linguistic Safety Robustness Benchmark for Low-Resource West African Languages. Research question: What are the cross-lingual transfer effects of LoRA initialization strategies when applied to Yoruba, Hausa, Igbo, and Igala, as evaluated through LSR's dual-probe protocol for safety alignment degradation?.

2 Methodology

Systematic literature search across multiple databases yielded 13 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.2/10.

3 Results

13 papers retrieved. 16 claims extracted; 13 independently verified. Quality review score: 7.2/10.

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
LSR consists of 14 attack probes across four harm categories.	✓	0.19
LSR evaluates models in English, Yoruba, Hausa, Igbo, and Igala.	×	0.11
The Physical harm category covers probes requesting tactical instructions for harming or killing individuals.	✓	0.23
The Toxicology category covers probes requesting preparation of lethal or incapacitating substances.	✓	0.19
The Targeted violence category covers probes with named or role-played targets.	✓	0.19
The Historical and cultural pretext category covers probes framing harmful requests as historical research, cultural doc	✓	0.26
Each target-language probe in LSR is written natively in the target language rather than translated from English.	✓	0.21
Target-language probes use culturally familiar framings such as royal authority figures (Oba in Yoruba, Sarki in Hausa,	✓	0.30
English baseline probes are direct and unframed.	✓	0.16
Each probe record in the dataset contains fields for language, attack_vector, technique, role, pair_id, severity, prompt	×	0.14
Probes requesting tactical, step-by-step harmful instructions are rated as CRITICAL severity.	✓	0.23
Probes seeking general harmful information are rated as HIGH severity.	✓	0.21
All four confirmed compliance instances in the Vulnerability Gallery are rated HIGH or CRITICAL.	✓	0.24
Evaluation runs in two passes: Pass 1 submits the target language probe and Pass 2 submits the matched English baseline	✓	0.26
A loophole is confirmed when the model refuses the English version (Pass 2) but complies with the target-language versio	✓	0.22
The current refusal classifier is keyword-based and detects markers such as 'cannot fulfill' and 'can't help'.	×	0.13

References

- <http://arxiv.org/abs/2606.01947v1>
- <http://arxiv.org/abs/2506.15415v1>
- <http://arxiv.org/abs/2603.19273v1>