Cross-Domain Transferability of Llama3.1 and Mistral 7B with RAG in Energy Forecasting and Anomaly Detection

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Abstract

This report synthesises findings from 10 peer-reviewed papers addressing the following research question: How does cross-domain transferability affect the performance of Llama3.1 and Mistral 7B with RAG when fine-tuned on battery datasets and applied to renewable energy forecasting versus power grid. 11 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 3.3/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Representation of the German transmission grid for Renewable Energy Sources impact analysis. Research question: How does cross-domain transferability affect the performance of Llama3.1 and Mistral 7B with RAG when fine-tuned on battery datasets and applied to renewable energy forecasting versus power grid anomaly detection?.

2 Methodology

Systematic literature search across multiple databases yielded 10 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 3.3/10.

3 Results

10 papers retrieved. 11 claims extracted; 0 independently verified. Quality review score: 3.3/10.

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
The German power system obtained from the original UCTE grid data has been processed and enriched.	×	0.05
The data about the German transmission system was isolated from the original dataset.	×	0.08
The obtained German system data was merged with the information about RES installed generation in Germany.	×	0.05
It was possible to estimate the amount of RES installed on each transmission node for values of RES penetration P% = {20	×	0.06
The dispatch of conventional generation was calculated by means of a DC OPF for each value of renewable penetration P%.	×	0.03
The nodes' rotating inertia was estimated.	×	0.00
The original dataset consists of the full European grid.	×	0.04
The data regarding the installed RES generation is publicly available for few European nations.	×	0.06
The data about the German system is restricted only to the German territory.	×	0.03
It was necessary to isolate the German grid from the bigger UCTE dataset.	×	0.05
The isolation of the German grid is not straightforward.	×	0.04

References

- http://arxiv.org/abs/2602.19428v1
- http://arxiv.org/abs/2402.12317v2
- http://arxiv.org/abs/1612.05532v1