Comparative Robustness of Qwen2.5 Instruction-Tuned Variants Versus Base Checkpoints on Adversarial Benchmarks

Assignee Research

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Abstract

Large language models (LLMs) are trained on huge datasets, which allow them to answer questions from various domains. However, their expertise is confined to the data that they were trained on. In order to specialize LLMs in niche domains like healthcare, various training methods can be employed. Two of these commonly known approaches are retrieval-augmented Generation and model fine-tuning. Five models-Llama-3.1-8B, Gemma-2-9B, Mistral-7B-Instruct, Qwen2.5-7B, and Phi-3.5-Mini-Instruct-were fine-tuned on healthcare data. These models were trained using three distinct approaches: retrieval-aug

1 Introduction

This paper examines: Medical LLMs: Fine-Tuning vs. Retrieval-Augmented Generation. Research question: What is the comparative robustness of Qwen2.5's instruction-tuned variants versus base checkpoints when evaluated on adversarial benchmarks like TruthfulQA or ANLI?.

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 7.6/10.

3 Results

13 papers retrieved. 8 claims extracted; 7 independently verified. Quality review score: 7.6/10.

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
Large language models (LLMs) are trained on huge datasets, which allow them to answer questions from various domains.	✓	0.30
The expertise of LLMs is confined to the data that they were trained on.	×	0.15
Five models-Llama-3.1-8B, Gemma-2-9B, Mistral-7B-Instruct, Qwen2.5-7B, and Phi-3.5-Mini-Instruct-were fine-tuned on heal	✓	0.39
These models were trained using three distinct approaches: retrieval-augmented generation (RAG) alone, fine-tuning (FT)	✓	0.50
The MedQuAD dataset covers a wide range of medical topics including disease symptoms, treatments, medications, and more.	✓	0.30
RAG and FT+RAG consistently outperformed FT alone across most models, particularly LLAMA and PHI.	✓	0.35
LLAMA and PHI excelled across multiple metrics, with LLAMA showing superior overall performance and PHI demonstrating st	✓	0.42
QWEN lagged behind in most metrics, while GEMMA and MISTRAL showed mixed results.	✓	0.26

References

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- https://doi.org/10.48550/arxiv.2409.12186
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