Feature-conditional alignment for LLM evaluation stability on imbalanced datasets

Assignee Research

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Abstract

Abstract The rapid evolution of large language models (LLMs) has driven a transformative shift in artificial intelligence (AI), reshaping both research paradigms and practical applications. Distinguished from their predecessors by unprecedented scale and advanced capabilities, LLMs necessitate new frameworks for understanding their development, behavior, and societal impact. This survey systematically reviews recent advancements in LLM techniques across four key dimensions: (1) pre-training methodologies, which establish core model capabilities through large-scale self-supervised training, arc

1 Introduction

This paper examines: A Survey of Large Language Models. Research question: Does feature-conditional alignment improve the stability of LLM capability evaluations on imbalanced datasets more effectively than class-conditional methods?.

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 8.3/10.

3 Results

10 papers retrieved. 10 claims extracted; 9 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
The rapid evolution of large language models (LLMs) has driven a transformative shift in artificial intelligence (AI).	✓	0.28
LLMs have reshaped both research paradigms and practical applications in AI.	×	0.12
LLMs are distinguished from their predecessors by unprecedented scale and advanced capabilities.	✓	0.22
The survey reviews advancements in pre-training methodologies, including large-scale self-supervised training, architect	✓	0.29
The survey reviews post-training techniques, including supervised fine-tuning and reinforcement learning.	✓	0.25
Post-training techniques adapt foundational models to downstream tasks and enhance their alignment and safety.	✓	0.27
The survey reviews utilization strategies such as in-context learning, prompt engineering, and agentic reasoning.	✓	0.24
Utilization strategies optimize real-world deployment and enable effective interaction with external environments.	✓	0.25
The survey reviews evaluation methods encompassing benchmarks for core language capabilities, reasoning, and safety.	✓	0.25
The survey identifies critical research issues concerning theoretical foundations, efficient scaling, alignment, and age	✓	0.25

References

- https://doi.org/10.48550/arxiv.2402.06196
- https://doi.org/10.1007/s11704-026-60308-3
- https://doi.org/10.48550/arxiv.2307.03109