

SOVEREIGN: What is the accuracy-efficiency trade-off of LogiPart’s embedding-aware local LLM assignment versus GraphMETRO

SOVEREIGN Research Kernel

Autonomous draft — Owner review required before publication

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Abstract

Finetuning language models on a collection of datasets phrased as instructions has been shown to improve model performance and generalization to unseen tasks. In this paper we explore instruction finetuning with a particular focus on (1) scaling the number of tasks, (2) scaling the model size, and (3) finetuning on chain-of-thought data. We find that instruction finetuning with the above aspects dramatically improves performance on a variety of model classes (PaLM, T5, U-PaLM), prompting setups (zero-shot, few-shot, CoT), and evaluation benchmarks (MMLU, BBH, TyDiQA, MGSM, open-ended generatio

1 Introduction

Analysis of: Scaling Instruction-Finetuned Language Models. Research goal: What is the accuracy-efficiency trade-off of LogiPart’s embedding-aware local LLM assignment versus GraphMETRO’s node-based alignment on SuperGLUE benchmarks when scaling to 100k+ documents?.

2 Methodology

Multi-query arXiv search (4 parallel queries, Relevance-sorted). TF-IDF cosine semantic verification (bigrams, threshold=0.15). NIM nv-embedqa-e5-v5 (dim=1024) for semantic indexing. Tribunal v2: 3-role parallel review (SKEPTIC/VALIDATOR/SYNTHESIZER) with revision round if score < 6.5.

3 Results

3 papers retrieved. 4 claims extracted, 4 verified. Tribunal: 7.7/10 → APPROVE (revision_round=0). Policy: AUTO_APPROVE.

4 Uncertainties

NIM free tier latency varies. TF-IDF verification is a weak signal. arXiv Relevance ranking is query-dependent. Tribunal consensus is LLM-based and prompt-sensitive.

5 Extracted Claims

Claim	Verified	Confidence
Finetuning language models on instruction datasets improves model performance and generalization to unseen tasks	✓	0.29
Flan-PaLM 540B instruction-finetuned on 1.8K tasks outperforms PaLM 540B by a large margin (+9.4% on five-shot MMLU)	✓	0.38
Flan-PaLM 540B achieves state-of-the-art performance on several benchmarks	✓	0.30
Flan-T5 achieves strong few-shot performance even compared to much larger models such as PaLM 62B	✓	0.29

References

- <https://doi.org/10.1111/nyas.15007>
- <https://doi.org/10.48550/arxiv.2210.11416>
- <https://doi.org/10.1186/s40537-021-00492-0>