Comparative Analysis of Token-Level and Sentence-Level Debiasing on Semantic Textual Similarity Preservation Across Diverse

Assignee Research

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Abstract

Large Language Models (LLMs) are capable of successfully performing many language processing tasks zero-shot (without training data). If zero-shot LLMs can also reliably classify and explain social phenomena like persuasiveness and political ideology, then LLMs could augment the Computational Social Science (CSS) pipeline in important ways. This work provides a road map for using LLMs as CSS tools. Towards this end, we contribute a set of prompting best practices and an extensive evaluation pipeline to measure the zero-shot performance of 13 language models on 25 representative English CSS ben

1 Introduction

This paper examines: Can Large Language Models Transform Computational Social Science?. Research question: How does the semantic textual similarity (STS) preservation of debiased contextualized embeddings compare when applying token-level versus sentence-level debiasing techniques across diverse domain benchmarks like STS-bench or Multi-Genre Natural Language Inference (MNLI)?.

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 9.0/10.

3 Results

10 papers retrieved. 6 claims extracted; 6 independently verified. Quality review score: 9.0/10.

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 capable of successfully performing many language processing tasks zero-shot.	✓	0.33
The study evaluates the zero-shot performance of 13 language models.	✓	0.21
The study evaluates models on 25 representative English Computational Social Science (CSS) benchmarks.	✓	0.26
On taxonomic labeling tasks, LLMs fail to outperform the best fine-tuned models.	✓	0.26
On taxonomic labeling tasks, LLMs achieve fair levels of agreement with humans.	✓	0.22
On free-form coding tasks, LLMs produce explanations that often exceed the quality of crowdworkers' gold references.	✓	0.28

References

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- https://doi.org/10.48550/arxiv.2305.03514
- https://doi.org/10.1080/19312458.2023.2261372