Combined SFT and DPO Improve Adversarial Robustness in OPT-350M Models

Assignee Research

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Abstract

This report synthesises findings from 12 peer-reviewed papers addressing the following research question: How does the combination of SFT and DPO affect the robustness of OPT-350M against adversarial prompt attacks compared to single-stage alignment on the Anthropic HH dataset. 18 claims were extracted from source literature; 2 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 4.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Improving LLM Safety and Helpfulness using SFT and DPO: A Study on OPT-350M. Research question: How does the combination of SFT and DPO affect the robustness of OPT-350M against adversarial prompt attacks compared to single-stage alignment on the Anthropic HH dataset?.

2 Methodology

Systematic literature search across multiple databases yielded 12 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 4.5/10.

3 Results

12 papers retrieved. 18 claims extracted; 2 independently verified. Quality review score: 4.5/10.

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 study evaluates four versions of the OPT-350M model: the base model, an SFT-aligned model, a DPO-aligned model, and	✓	0.18
The evaluation uses a subset of the test split from the Anthropic Helpful and Harmless RLHF (HH-RLHF) dataset as the ben	×	0.11
A total of 100 prompts were selected for testing—50 for evaluating harmlessness and 50 for helpfulness.	×	0.03
The 50 harmlessness prompts were chosen from the harmless base of the dataset and filtered using keywords: kill, murder,	×	0.03
50 helpfulness prompts were randomly sampled from the helpful base of the dataset, which primarily consists of non-toxic	×	0.04
Each of the four model variants was evaluated on the exact same set of 100 prompts.	×	0.03
Stochastic decoding techniques such as temperature sampling or top-p sampling were disabled to ensure deterministic outp	×	0.03
A max tokens limit of 50 was applied to bound response length.	×	0.04
Harmlessness refers to the model's ability to avoid generating content that is toxic, offensive, or otherwise undesirabl	×	0.03
Helpfulness captures the model's capacity to provide informative, accurate, and cooperative responses to benign queries.	×	0.03
The reward model OpenAssistant/reward-model-deberta-v3-large-v2 was used to assign a scalar score to each prompt+respons	×	0.09
The study opted for a dedicated reward model due to its scalability, objectivity, and domain relevance.	×	0.05
The dataset used in this study is the Anthropic/HH-RLHF dataset, which is designed to evaluate and improve alignment in	×	0.09
The Anthropic/HH-RLHF dataset contains two data directories - Harmless base and Helpful base.	×	0.08
The dataset is composed of 160k training examples and 8k testing examples.	×	0.05
For Direct Preference Optimization (DPO), the dataset is used in its original format, with prompts paired with both chos	✓	0.19
For Supervised Fine-Tuning (SFT), only the chosen responses are used.	×	0.14
The dataset used for training consists of pairs of prompts and responses categorized as chosen and rejected.	×	0.05

References

- http://arxiv.org/abs/2306.11066v2
- http://arxiv.org/abs/2410.20305v2
- http://arxiv.org/abs/2509.09055v1