

Synthetic-to-Real Sample Ratio Effects on CausalMixFT Generalization in Tabular Models

Assignee Research

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Abstract

This report synthesises findings from 7 peer-reviewed papers addressing the following research question: What is the impact of varying the ratio of synthetic-to-real samples in CausalMixFT on the generalization performance of fine-tuned tabular foundation models, measured by accuracy on CINIC-10 and other OOD benchmarks? 11 claims were extracted from source literature; 11 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 9.3/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Symbolic Discovery of Optimization Algorithms. Research question: What is the impact of varying the ratio of synthetic-to-real samples in CausalMixFT on the generalization performance of fine-tuned tabular foundation models, measured by accuracy on CINIC-10 and other OOD benchmarks?.

2 Methodology

Systematic literature search across multiple databases yielded 7 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 9.3/10.

3 Results

7 papers retrieved. 11 claims extracted; 11 independently verified. Quality review score: 9.3/10.

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 method presented in the paper formulates algorithm discovery as program search and applies it to discover optimizations	✓	0.23
The method leverages efficient search techniques to explore an infinite and sparse program space.	✓	0.22
The method introduces program selection and simplification strategies to bridge the large generalization gap between pro	✓	0.24
The method discovers a simple and effective optimization algorithm called Lion (EvoLved Sign Momentum).	✓	0.18
Lion is more memory-efficient than Adam as it only keeps track of the momentum.	✓	0.21
Different from adaptive optimizers, Lion’s update has the same magnitude for each parameter calculated through the sign	✓	0.23
Lion boosts the accuracy of ViT by up to 2% on ImageNet.	✓	0.19
Lion saves up to 5x the pre-training compute on JFT.	✓	0.21
On vision-language contrastive learning, Lion achieves 88.3% zero-shot and 91.1% fine-tuning accuracy on ImageNet, surpa	✓	0.30
On diffusion models, Lion outperforms Adam by achieving a better FID score and reducing the training compute by up to 2.	✓	0.31
For autoregressive, masked language modeling, and fine-tuning, Lion exhibits a similar or better performance compared to	✓	0.32

References

- <https://doi.org/10.1561/22000000071>
- <https://doi.org/10.48550/arxiv.2302.06675>
- <https://doi.org/10.1016/j.csbj.2024.07.005>