

Structural Causal Models Enhance Tabular Foundation Model Robustness Under Domain Shifts

Assignee Research

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Abstract

This report synthesises findings from 11 peer-reviewed papers addressing the following research question: How does the integration of CausalMixFT's structural causal models impact the accuracy of tabular foundation models on out-of-distribution benchmarks compared to traditional Mixup techniques across. 14 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 3.8/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Benchmarking Distribution Shift in Tabular Data with TableShift. Research question: How does the integration of CausalMixFT's structural causal models impact the accuracy of tabular foundation models on out-of-distribution benchmarks compared to traditional Mixup techniques across diverse domain shifts?.

2 Methodology

Systematic literature search across multiple databases yielded 11 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 3.8/10.

3 Results

11 papers retrieved. 14 claims extracted; 0 independently verified. Quality review score: 3.8/10.

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
Food insecurity affects more than 10% of households (13.5 million) across the United States in 2021.	×	0.01
The American Community Survey (ACS) is used as a data source for the Food Stamps benchmark task.	×	0.04
The Food Stamps benchmark task filters data for low-income adults aged 18-62 in households with at least one child.	×	0.02
An income threshold of \$30000 is used based on the U.S. poverty threshold for a family with one child.	×	0.02
The ACS includes 10 regions: Puerto Rico; New England (Northeast region); Middle Atlantic (Northeast region); East North	×	0.01
The East South Central (South region) is used as the holdout domain for the Food Stamps task.	×	0.02
The benchmark table shows a Δ of -34.49% for the ASSISTments Next Answer Correct School task.	×	0.01
The benchmark table shows a Δ of -11.16% for the College Scorecard Low Degree Completion Rate Institution Type task.	×	0.01
The benchmark table shows a Δ of -6.30% for the ICU Hospital Mortality task.	×	0.02
The benchmark table shows a Δ of -5.94% for the Hospital Readmission task.	×	0.02
The benchmark table shows a Δ of -4.48% for the Diabetes task.	×	0.02
The benchmark table shows a Δ of -3.39% for the ICU Length of Stay task.	×	0.02
The benchmark table shows a Δ of -2.58% for the Voting task.	×	0.02
The benchmark table shows a Δ of -4.48% for the Food Stamps task.	×	0.02

References

- <http://arxiv.org/abs/2601.04110v2>

- <http://arxiv.org/abs/2512.03307v1>
- <http://arxiv.org/abs/2312.07577v3>