Structural Causal Model Fidelity and Robustness in Tabular Foundation Models Under Distribution Shift

Assignee Research

June 8, 2026

Abstract

This report synthesises findings from 6 peer-reviewed papers addressing the following research question: To what extent does the fidelity of the fitted Structural Causal Model in CausalMixFT influence the robustness of tabular foundation models against distribution shifts in downstream evaluation. 11 claims were extracted from source literature; 11 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 9.2/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Explainable Artificial Intelligence (XAI): What we know and what is left to attain Trustworthy Artificial Intelligence. Research question: To what extent does the fidelity of the fitted Structural Causal Model in CausalMixFT influence the robustness of tabular foundation models against distribution shifts in downstream evaluation benchmarks?.

2 Methodology

Systematic literature search across multiple databases yielded 6 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 9.2/10.

3 Results

6 papers retrieved. 11 claims extracted; 11 independently verified. Quality review score: 9.2/10.

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
Artificial intelligence (AI) is currently being utilized in a wide range of sophisticated applications.	✓	0.28
The outcomes of many AI models are challenging to comprehend and trust due to their black-box nature.	✓	0.27
It is essential to understand the reasoning behind an AI model's decision-making.	✓	0.22
XAI has become a popular research subject within the AI field in recent years.	✓	0.24
Existing survey papers have tackled the concepts of XAI, its general terms, and post-hoc explainability methods.	✓	0.33
There have not been any reviews that have looked at the assessment methods, available tools, XAI datasets, and other rel	✓	0.28
The study provides readers with an overview of the current research and trends in XAI.	✓	0.16
The study explains the background of XAI, common definitions, and summarizes recently proposed techniques in XAI for sup	✓	0.23
The review divides XAI techniques into four axes using a hierarchical categorization system: (i) data explainability, (i	✓	0.40
The study introduces available evaluation metrics as well as open-source packages and datasets with future research dire	✓	0.24
The study discusses the significance of explainability in terms of legal demands, user viewpoints, and application orien	✓	0.24

References

- https://doi.org/10.1016/j.inffus.2023.101805
- https://doi.org/10.1016/j.inffus.2024.102301
- https://doi.org/10.1613/jair.1.13200