

[PDF] [Fault Localization Using Interventional Causal Learning for Cloud-Native Applications](#)

S Jha, JR Aliaga, F Bagehorn, L Schwartz, N Abe - Annual IEEE/IFIP International ..., 2024

In this work, we share our experience of using recently proposed fault localization techniques based on interventional causal learning applied in the context of cloud-native applications. We identify several assumptions that prevent successful ...

[PDF] [Counterfactual Graphical Models: Constraints and Inference](#)

J Correa, E Bareinboim - 2024

Graphical models have been widely used as parsimonious encoders of constraints of the underlying probability models. When organized in a structured way, these models can facilitate the derivation of non-trivial constraints, the inference of ...

[PDF] [Methods in causal inference part 3: Measurement error and external validity threats](#)

JA Bulbulia - Evolutionary Human Sciences, 2024

The human sciences should seek generalisations wherever possible. For ethical and scientific reasons, it is desirable to sample more broadly than 'Western, Educated, Industrialised, Rich, and Democratic'(WEIRD) societies. However, restricting the ...

[Temporal-spatial-fusion-based risk assessment on the adjacent building during deep excavation](#)

Y Pan, X Zhou, JJ Chen, Y Hong - Information Fusion, 2024

Foundation pit excavation will inevitably cause uneven ground settlement to pose potential risks to adjacent structures and infrastructures. To better perceive the risk status of adjacent buildings using multi-source information, a temporal-spatial-fusion ...

[Your Neighbor Matters: Towards Fair Decisions Under Networked Interference](#)

W Yang, H Wang, H Li, H Zou, R Jin, K Kuang, P Cui - Proceedings of the 30th ACM ..., 2024

In the era of big data, decision-making in social networks may introduce bias due to interconnected individuals. For instance, in peer-to-peer loan platforms on the Web, considering an individual's attributes along with those of their interconnected ...

[Calibration of Time-Series Forecasting: Detecting and Adapting Context-Driven Distribution Shift](#)

M Chen, L Shen, H Fu, Z Li, J Sun, C Liu - Proceedings of the 30th ACM SIGKDD ..., 2024

Recent years have witnessed the success of introducing deep learning models to time series forecasting. From a data generation perspective, we illustrate that existing models are susceptible to distribution shifts driven by temporal contexts, whether ...

[Causal Estimation of Exposure Shifts with Neural Networks and an Application to Inform Air Quality Standards in the US](#)

M Tec, K Josey, O Mudele, F Dominici - Proceedings of the 30th ACM SIGKDD ..., 2024

A fundamental task in causal inference is estimating the effect of a distribution shift in the treatment variable. We refer to this problem as shift-response function (SRF) estimation. Existing neural network methods for causal inference lack theoretical ...

[Evolution evolving: The developmental origins of adaptation and biodiversity](#)

KN Lala, T Uller, N Feiner, M Feldman, SF Gilbert - 2024

A new account of the central role developmental processes play in evolution A new scientific view of evolution is emerging—one that challenges and expands our understanding of how evolution works. Recent research demonstrates that ...

[PDF] [Understanding, predicting, optimizing business processes using data](#)

B Wiegand - 2024

Companies face a disruptive digital transformation, which forces them to adapt their business model and innovate faster than ever before. Companies that do not transform rapidly enough risk to fall behind and fail in competition. On the other hand ...

[PDF] [Counterfactual Graphical Models: Constraints and Inference](#)

J Correa, E Bareinboim - 2024

Graphical models have been widely used as parsimonious encoders of constraints of the underlying probability models. When organized in a structured way, these models can facilitate the derivation of non-trivial constraints, the inference of ...

[强化学习框架中因果推断研究进展.](#)

刘华玲, 朱建亮, 任青青 - Journal of Zhejiang University (Science Edition), 2024

因果推断在科学领域备受关注. 近年来, 因果关系的确定方法有所创新. 强化学习作为一种机器学习方法, 主要关注智能体如何在环境中采取行动, 以最大化累积奖励. 将因果推断方法嵌套在强化学习框架中的思想是因果推断领域以及 ...

[PDF] [Buku Referensi Strategi Manajemen Sumber Daya Manusia Meningkatkan Kinerja dan Produktivitas Organisasi](#)

ST Friscila, AS ME - 2024

Buku referensi “Strategi Manajemen Sumber Daya Manusia Meningkatkan Kinerja dan Produktivitas Organisasi” ini membahas berbagai aspek manajemen sumber daya manusia yang kritis dalam membangun fondasi yang kuat untuk pencapaian ...

[Is the JAMA opening up their language for causal effects? causal inference](#)

W van Amsterdam

Randomized controlled trials (RCTs) measure the causal effect of interventions, but results from observational studies should be interpreted as mere associations, right? In a great piece in the JAMA, Issa Dehabreh and Kirsten Bibbins-Domingo describe ...

[PDF] [General targeted machine learning for modern causal mediation analysis](#)

R Liu, NT Williams, KE Rudolph, I Díaz - arXiv preprint arXiv:[2408.14620](#), 2024

Causal mediation analyses investigate the mechanisms through which causes exert their effects, and are therefore central to scientific progress. The literature on the non-parametric definition and identification of mediational effects in rigorous causal ...

[PDF] [Localize-and-Stitch: Efficient Model Merging via Sparse Task Arithmetic](#)

Y He, Y Hu, Y Lin, T Zhang, H Zhao - arXiv preprint arXiv:[2408.13656, 2024](#)

Model merging offers an effective strategy to combine the strengths of multiple finetuned models into a unified model that preserves the specialized capabilities of each. Existing methods merge models in a global manner, performing arithmetic ...

[Uncovering the Interpretation of Large Language Models](#)

MS Akter, H Shahriar, A Cuzzocrea, F Wu - 2024 IEEE 48th Annual Computers ..., 2024

Recent research has shown growing interest in the arithmetic reasoning capabilities of large language models (LLMs), especially those built on the Transformer architecture. However, our understanding of the intrinsic processes within these ...

[PDF] [Causal-Guided Active Learning for Debiasing Large Language Models](#)

Z Sun, L Du, X Ding, Y Ma, K Qiu, T Liu, B Qin - arXiv preprint arXiv:[2408.12942, 2024](#)

Although achieving promising performance, recent analyses show that current generative large language models (LLMs) may still capture dataset biases and utilize them for generation, leading to poor generalizability and harmfulness of LLMs ...

[PDF] [Eliater: A Python package for estimating outcomes of perturbations in biomolecular networks](#)

S Mohammad-Taheri, PP Navada, CT Hoyt, J Zucker... - Bioinformatics, 2024

Abstract Summary We introduce Eliater, a Python package for estimating the effect of perturbation of an upstream molecule on a downstream molecule in a biomolecular network. The estimation takes as input a biomolecular network, observational ...

[PDF] [What if? Causal Machine Learning in Supply Chain Risk Management](#)

M Wyrembek, G Baryannis, A Brintrup - arXiv preprint arXiv:[2408.13556, 2024](#)

The penultimate goal for developing machine learning models in supply chain management is to make optimal interventions. However, most machine learning models identify correlations in data rather than inferring causation, making it difficult ...

[PDF] [Causal machine learning for sustainable agroecosystems](#)

V Sitokonstantinou, EDS Porras, JC Bautista, M Piles... - arXiv preprint arXiv ..., 2024

In a changing climate, sustainable agriculture is essential for food security and environmental health. However, it is challenging to understand the complex interactions among its biophysical, social, and economic components. Predictive ...

[PDF] [ALIAS: DAG Learning with Efficient Unconstrained Policies](#)

B Duong, H Le, T Nguyen - arXiv preprint arXiv:[2408.13448, 2024](#)

Recently, reinforcement learning (RL) has proved a promising alternative for conventional local heuristics in score-based approaches to learning directed acyclic causal graphs (DAGs) from observational data. However, the intricate acyclicity ...

[PDF] [Effects Among the Affected](#)

LM Montoya, EH Geng, M Valancius, MR Kosorok... - arXiv preprint arXiv ..., 2024

Many interventions are both beneficial to initiate and harmful to stop. Traditionally, to determine whether to deploy that intervention in a time-limited way depends on if, on average, the increase in the benefits of starting it outweigh the increase in the harms ...

[Uncovering the Interpretation of Large Language Models](#)

MS Akter, H Shahriar, A Cuzzocrea, F Wu – 2024 IEEE 48th Annual Computers ..., 2024

Recent research has shown growing interest in the arithmetic reasoning capabilities of large language models (LLMs), especially those built on the Transformer architecture. However, our understanding of the intrinsic processes within these ...

[PDF] [The Generalized Causal-Effect Score in Databases](#)

F Azua – 2024

The Causal Effect is a numerical measure used to uncover and analyze causal relationships between variables. In particular, it deals with interventions on variables and their effects in the broad areas of observational studies and structural causality ...

[PDF] [Managing Popularity Bias in Expert Recommendation System of CQA with Counterfactual Reasoning](#)

J Li, B Liu, X Shao, E Xu, S Wu – Authorea Preprints, 2024

The core purpose of a recommender system is to provide users with personalized recommendations, not just popular items. The current expert recommendation training paradigm in community Question Answering (CQA) scenarios, ie, fitting a ...

[PDF] [Parliamentary Budget Office](#)

AP Model, A Suzuki – 2024

Are trade-open economies more vulnerable or less so to extreme events? Extreme events, such as natural disasters, financial crises, and war, are infrequent but have large negative effects on economies. This paper presents a new, parsimonious ...

[PDF] [Length-Controlled AlpacaEval: A Simple Debiasing of Automatic Evaluators](#)

Y Dubois, P Liang, T Hashimoto – First Conference on Language Modeling

LLM-based auto-annotators have become a key component of the LLM development process due to their cost-effectiveness and scalability compared to human-based evaluation. However, these auto-annotators can introduce complex biases that are ...

[Spectator in the Cartesian Theater](#)

C Theater

As a student, I found important parts of philosophy difficult and obscure. Much later, I discovered that it was not my fault. This book explains why. I'm not referring to Continental philosophy whose obscurity is notorious but to central parts of Analytical ...

[PDF] [Internship proposal Optimal adjustability of causal effects](#)

S Ferreira, C Assaad

Context: The Pierre Louis Institute of Epidemiology and Public Health (IPLESP), co-accredited by Inserm and Sorbonne University, brings together research strengths in epidemiology and public health within Sorbonne University. IPLESP's main objective ...

[PDF] [Adaptive Weighted Random Isolation \(AWRI\): a simple design to estimate causal effects under network interference](#)

C Shi, H Yang, Y Qin, Y Li - arXiv preprint arXiv:[2408.15670](#), 2024

Recently, causal inference under interference has gained increasing attention in the literature. In this paper, we focus on randomized designs for estimating the total treatment effect (TTE), defined as the average difference in potential outcomes ...

[HTML] [Causal Analysis to Explain the Performance of Algorithms: A Case Study for the Bin Packing Problem](#)

JB Vázquez-Aguirre, G Carmona-Arroyo... - Mathematical and ..., 2024

This work presents a knowledge discovery approach through Causal Bayesian Networks for understanding the conditions under which the performance of an optimization algorithm can be affected by the characteristics of the instances of a ...

[PDF] [Identifying Influential and Vulnerable Nodes in Interaction Networks through Estimation of Transfer Entropy Between Univariate and Multivariate Time Series](#)

J Lee - arXiv preprint arXiv:[2408.15811](#), 2024

Transfer entropy (TE) is a powerful tool for measuring causal relationships within interaction networks. Traditionally, TE and its conditional variants are applied pairwise between dynamic variables to infer these causal relationships. However ...

[PDF] [Industrial Distraction](#)

D Freeborn, C O'Connor - 2024

There are myriad techniques industry actors use to shape the public understanding of science. While a naive view of this sort of influence might assume these techniques typically involve fraud and/or outright deception, the truth is more ...

[PDF] [Inteligencia artificial en apoyo a la inteligencia militar. Eje fundamental del éxito o fracaso en la competición estratégica entre grandes potencias](#)

JLS Sánchez - Cuadernos de estrategia, 2024

La potencia de la inteligencia artificial, IA, en los futuros desarrollos tecnológicos impactará de manera drástica en el predominio mundial y en la competición estratégica entre grandes potencias, la forma de afrontar las crisis y conflictos ...

[HTML] [Look on the bright side: the relation between family values, positive aspects of care and caregiver burden](#)

L Zwar, HH König, A Hajek – European Journal of Ageing, 2024

Family-centered values are important for caregiving. However, findings on their association with burden are inconsistent. We aim to analyze whether positive aspects of caregiving are mediating the effect of familism on burden among informal ...

[Establishing causal inferences from experimental and observational data: A critical review and primer for sport and exercise psychology.](#)

GR Ruissen – Sport, Exercise, and Performance Psychology, 2024

Causal inference is a central goal of research in sport and exercise psychology. However, current norms in sport and exercise psychology privilege experimental designs over observational designs for deriving causal inferences. Causal ...

[PDF] [Causal Priors and Their Influence on Judgements of Causality in Visualized Data](#)

AZ Wang, D Borland, TC Peck, W Wang, D Gotz – arXiv preprint arXiv:[2408.16077](#), 2024

“Correlation does not imply causation” is a famous mantra in statistical and visual analysis. However, consumers of visualizations often draw causal conclusions when only correlations between variables are shown. In this paper, we investigate factors ...

[Embedding cyclic information-theoretic structures in acyclic space-times: No-go results for indefinite causality](#)

V Vilasini, R Renner – Physical Review A, 2024

The notions of causality adopted within the quantum information and space-time physics communities are distinct. Although experience tells us that these notions play together in a compatible manner in physical experiments, their general interplay is ...

[PDF] [Targeted Cause Discovery with Data-Driven Learning](#)

JH Kim, CS Gibbs, S Yun, HO Song, K Cho – arXiv preprint arXiv:[2408.16218](#), 2024

We propose a novel machine learning approach for inferring causal variables of a target variable from observations. Our goal is to identify both direct and indirect causes within a system, thereby efficiently regulating the target variable when the ...

[PDF] [Granger causal inference for climate change attribution](#)

MD Risser, M Ombadi, MF Wehner – arXiv preprint arXiv:[2408.16004](#), 2024

Climate change detection and attribution (D&A) is concerned with determining the extent to which anthropogenic activities have influenced specific aspects of the global climate system. D&A fits within the broader field of causal inference, the ...

[PDF] [Beyond Correlation: Incorporating Counterfactual Guidance to Better Support Exploratory Visual Analysis](#)

AZ Wang, D Borland, D Gotz – arXiv preprint arXiv:[2408.16078, 2024](#)

Providing effective guidance for users has long been an important and challenging task for efficient exploratory visual analytics, especially when selecting variables for visualization in high-dimensional datasets. Correlation is the most widely applied ...

[PDF] [A Gradient Analysis Framework for Rewarding Good and Penalizing Bad Examples in Language Models](#)

YL Tuan, WY Wang – arXiv preprint arXiv:[2408.16751, 2024](#)

Beyond maximum likelihood estimation (MLE), the standard objective of a language model (LM) that optimizes good examples probabilities, many studies have explored ways that also penalize bad examples for enhancing the quality of output distribution ...

[Data-Driven Decision Support for Business Processes: Causal Reasoning and Discovery](#)

AJ Alaei, M Weidlich, A Senderovich – International Conference on Business Process ..., 2024

Various types of decisions influence the execution of a business process, eg, in terms of control-flow and resource assignments. Data recorded during process execution can be used to identify which decisions are informed by data and by ...

[ADR: An Adversarial Approach to Learn Decomposed Representations for Causal Inference](#)

X Zheng, G Tian, S Wang, Z Huang - ... European Conference on Machine Learning and ..., 2024

Estimating the individual treatment effect (ITE) from observational data is an important issue both theoretically and practically. While including all the pre-treatment covariates is the common practice for the inclusion of all possible ...

[PDF] [Seeking the Sufficiency and Necessity Causal Features in Multimodal Representation Learning](#)

B Chen, J Liu, Z Li – arXiv preprint arXiv:[2408.16577, 2024](#)

Learning representations with a high Probability of Necessary and Sufficient Causes (PNS) has been shown to enhance deep learning models' ability. This task involves identifying causal features that are both sufficient (guaranteeing the outcome) and ...

[HTML] [Robust inference for systems under distribution shifts](#)

L Hult – 2024

Not a day goes by without you making decisions, choosing between different options, all with unknown outcomes. Some decisions are less severe, like what to eat for dinner. Others have larger consequences, like what school to put your child in. We ...

[PDF] [Incorporating Aaron Copland's Philosophy of Inclusion in Midwest Rural Band Programs: A Qualitative Study of Attracting and Retaining Students of Low ...](#)

J Laflamme – 2024

The field of music education has established the value of instrumental band music instruction as congruent with students' intellectual, kinesthetic, psychological, and academic success.

However, one should scrutinize the validity of the above data, as ...

[PDF] [Counterfactual Identification Under Monotonicity Constraints](#)

A Maiti, D Plecko, E Bareinboim

Abstract Reasoning with counterfactuals is one of the hallmarks of human cognition, involved in various tasks such as explanation, credit assignment, blame, and responsibility. Counterfactual quantities that are not identifiable in the general ...

[PDF] [Testing Causal Models with Hidden Variables in Polynomial Delay via Conditional Independencies](#)

H Jeong, A Ejaz, J Tian, E Bareinboim

Testing a hypothesized causal model against observational data is a key prerequisite for many causal inference tasks. A natural approach is to test whether the conditional independence relations (Cis) assumed in the model hold in the data ...

[Addressing Heterogeneity in Longitudinal Intervention Effects Using a Causal Mediation Framework](#)

H Kim – 2024

An essential challenge in evaluating the effects of educational practices over time lies in examining the mechanisms through which an intervention operates. Traditional statistical methods, which primarily focus on analyzing average ...

[Beyond Causal Pairs: A Probabilistic Approach to Causal Structure Learning From Cause-Effect Pair Relationships Using Graph Neural Network](#)

MR Rashid – 2024

Abstract Machine learning has risen to the forefront of scientific research due to its unparalleled predictive capabilities. As a result, researchers have become increasingly interested in uncovering the underlying causal structures that govern the ...

[Counterfactual Closeness: How Some Nonactual Events Appear Closer Than Others](#)

M Myers – 2024

Some non-actual events feel closer to having happened than others. Our capacity for counterfactual thought—to reason about events not as they were, but as they could have been—helps inform such closeness intuitions. This dissertation seeks to ...

[Künstliche Intelligenz und autonome Systeme](#)

K Mainzer - Handbuch Technikphilosophie, 2024

Traditionell wurde KI (Künstliche Intelligenz) als Simulation intelligenten menschlichen Denkens und Handelns aufgefasst. Diese Definition krankt daran, dass „intelligentes menschliches Denken“ und „Handeln“ nicht definiert sind. Ferner ...

[Mechanisms for Data Sharing](#)

B Filter, R Möller, ÖL Özçep - KI 2024: Advances in Artificial Intelligence: 47th ...

Collaborative causal inference (CCI) is a federated learning method for pooling data from multiple, often self-interested, parties, to achieve a common learning goal over causal structures, eg estimation and optimization of treatment variables in a medical ...

[PDF] [A Guide and General Method for Estimating Parameters and their Confidence Intervals in Agent-Based Simulations with Stochasticity](#)

C Zosh, N Dhameja, Y Ren, A Pape

While many Agent-Based Models (ABMs) traditionally serve to demonstrate proof of principle type findings, it is becoming increasingly common and desirable for such models to be used directly for estimation. Given the increasing prevalence of ...

[Improving Model Generalization for Short-Term Customer Load Forecasting With Causal Inference](#)

Z Wang, H Zhang, R Yang, Y Chen - IEEE Transactions on Smart Grid, 2024

Short-term customer load forecasting is vital for the normal operation of power systems. Unfortunately, conventional machine learning-based forecasting methods are susceptible to generalization issues (eg, the customer heterogeneity and ...

[PDF] [Causal Artificial Intelligence–driven Approach for HVAC Preventive Maintenance Explanation](#)

M Kiangkhiao, K Haruehansapong, K Yeranee... - IEEE Access, 2024

Preventive maintenance of heating, ventilation, and air conditioning (HVAC) systems aims to monitor and detect early-stage failures, thereby enhancing thermal comfort satisfaction and reducing energy consumption. However, it is a complex and ...