

[PDF] **R&D Subsidies and Technological Progress in the Chinese ICT Manufacturing Industry**

J Li - 2022

In the past decades, the Chinese ICT industry has received fiscal, taxation, and financial policy support in technology R&D. This research adopts causal inference methods for mediation analysis with interaction to empirically examine the direct and ...

[PDF] **FedGen: Generalizable Federated Learning**

P Venkateswaran, V Isahagian, V Muthusamy... - arXiv preprint arXiv ..., 2022

Existing federated learning models that follow the standard risk minimization paradigm of machine learning often fail to generalize in the presence of spurious correlations in the training data. In many real-world distributed settings, spurious ...

[PDF] **Bayesian Counterfactual Mean Embeddings and Off-Policy Evaluation**

D Martinez-Taboada, D Sejdinovic - arXiv preprint arXiv:2211.01518, 2022

The counterfactual distribution models the effect of the treatment in the untreated group. While most of the work focuses on the expected values of the treatment effect, one may be interested in the whole counterfactual distribution or other quantities ...

[PDF] **Widening or closing the gap? Exploring heterogenous effects of developmental education on persistence for college for students with learning and attention ...**

R Wells, L Chen - White Paper, 2022

Developmental education (ie, remedial education) has come under scrutiny in the past decade in response to evidence suggesting that it is ineffective for learning or hinders students' progress toward degree completion (eg, Scott-Clayton and ...

[PDF] **A Consistent Estimator for Confounding Strength**

L Rendsburg, LC Vankadara, D Ghoshdastidar... - arXiv preprint arXiv ..., 2022

Regression on observational data can fail to capture a causal relationship in the presence of unobserved confounding. Confounding strength measures this mismatch, but estimating it requires itself additional assumptions. A common ...

[PDF] **Equilibrium Causal Models: Connecting Dynamical Systems Modeling and Cross-Sectional Data Analysis**

O Ryan, F Dablander - 2022

Many psychological phenomena can be understood as systems of causally connected components that evolve over time within an individual. In current empirical practice, researchers frequently study these systems by fitting statistical models to ...

Personalized Recommendation through Disentangled Representation Learning of Consumers' Multiple Digital Footprints

Y Shi, C Wang, X Guo, G Chen - 2022

The pervasiveness of multiple types of digital footprints recorded on e-commerce platforms have added fuel to the design of personalized recommender systems. Despite the abundance, consumers' digital footprints can be confounded with many ...

[PDF] **Causality and Machine Learning Review**

A Rawal, A Raglin, DB Rawat, BM Sadler

Causal inference has likely been a part of science as long as science itself, with the idea of cause and effect having defined the fundamental sciences from Newtons laws to the devastating COVID-19 pandemic. The cause explains the why, whereas ...

[HTML] **Through the looking glass: deep interpretable dynamic directed connectivity in resting fMRI**

U Mahmood, Z Fu, S Ghosh, V Calhoun, S Plis - *NeuroImage*, 2022

Brain network interactions are commonly assessed via functional (network) connectivity, captured as an undirected matrix of Pearson correlation coefficients. Functional connectivity can represent static and dynamic relations, but often these ...

UAMPnet: Unrolled approximate message passing network for nonconvex regularization

H Zhang, S Li, Y Liang, H Zhang, M Du - *Expert Systems with Applications*, 2022

Deep neural networks and model-based methods are both popular for their wide and great success in many inference problems. In this paper, resorting to deep learning, we study the efficient algorithms for two popular nonconvex regularization methods ...

[PDF] **Causal inference on observational data: Opportunities and challenges in earthquake engineering**

H Burton - *Earthquake Spectra*, 2022

Collecting and analyzing observational data are essential to learning and implementing lessons in earthquake engineering. Historically, the methods that have been used to analyze and draw conclusions from empirical data have been limited to ...

[PDF] **Bayesian learning of Causal Structure and Mechanisms with GFlowNets and Variational Bayes**

M Nishikawa-Toomey, T Deleu, J Subramanian... - *arXiv preprint arXiv ...*, 2022

Bayesian causal structure learning aims to learn a posterior distribution over directed acyclic graphs (DAGs), and the mechanisms that define the relationship between parent and child variables. By taking a Bayesian approach, it is possible to reason ...

[PDF] **Pairwise and high-order dependencies in the cryptocurrency trading network**

A Pluchino, A Rapisarda, S Stramaglia - *Scientific Reports*, 2022

In this paper we analyse the effects of information flows in cryptocurrency markets. We first define a cryptocurrency trading network, ie the network made using cryptocurrencies as nodes and the Granger causality among their weekly log returns ...

[PDF] **Deep Causal Learning: Representation, Discovery and Inference**

Z Deng, X Zheng, H Tian, DD Zeng - *arXiv preprint arXiv:2211.03374*, 2022

Causal learning has attracted much attention in recent years because causality reveals the essential relationship between things and indicates how the world progresses. However, there are many problems and bottlenecks in traditional causal ...

[\[PDF\] Deconfounded Imitation Learning](#)

R Vuorio, J Brehmer, H Ackermann, D Dijkman... - arXiv preprint arXiv ..., 2022

Standard imitation learning can fail when the expert demonstrators have different sensory inputs than the imitating agent. This is because partial observability gives rise to hidden confounders in the causal graph. We break down the space of ...

[The Statistics of Interpretable Machine Learning](#)

DS Watson - The 2021 Yearbook of the Digital Ethics Lab, 2022

Statisticians, especially those who do applied work in the natural and social sciences, have long been interested in understanding model parameters and predictions. However, the distinct subfield of interpretable machine learning (IML) ...

[\[PDF\] Evaluating Digital Tools for Sustainable Agriculture using Causal Inference](#)

I Tsoumas, G Giannarakis, V Sitokonstantinou... - arXiv preprint arXiv ..., 2022

In contrast to the rapid digitalization of several industries, agriculture suffers from low adoption of climate-smart farming tools. Even though AI-driven digital agriculture can offer high-performing predictive functionalities, it lacks tangible quantitative evidence ...

[\[PDF\] Personalizing Sustainable Agriculture with Causal Machine Learning](#)

G Giannarakis, V Sitokonstantinou, RS Lorilla... - arXiv preprint arXiv ..., 2022

To fight climate change and accommodate the increasing population, global crop production has to be strengthened. To achieve the "sustainable intensification" of agriculture, transforming it from carbon emitter to carbon sink is a priority, and ...

[\[PDF\] Changes from Classical Statistics to Modern Statistics and Data Science](#)

K Zhang, S Liu, M Xiong - arXiv preprint arXiv:2211.03756, 2022

A coordinate system is a foundation for every quantitative science, engineering, and medicine. Classical physics and statistics are based on the Cartesian coordinate system. The classical probability and hypothesis testing theory can only be applied to ...

[\[PDF\] Modus inversus](#)

I Barukčić - Causation, 2023

Background: A true conclusion follows deductively from true premises. However, what if the premises are not true? Therefore, certain aspects of the relation between premises and conclusions in valid arguments are re-investigated again. Methods ...

[\[PDF\] Conditions and study design](#)

I Barukčić - Causation, 2023

CAUSATION Page 1 CAUSATION \u00d83C\u00df0D International Journal of Science CAUSATION, 18(1): 5–99 DOI:10.5281/zenodo.6816088 Received: July 10, 2022 Accepted: July 10, 2022 Published: July 10, 2022 Deutsche Nationalbibliothek Frankfurt Conditions and ...

[PDF] **Epstein-Barr virus is the cause of human breast cancer**

I Barukčić - Causation, 2022

Background. Epstein-Barr virus has been widely proposed as a possible candidate virus for the viral etiology of human breast cancer, still the most common malignancy affecting females worldwide. Methods. Due to possible problems with PCR analyses ...

[PDF] **Coherent Causal Control: A New Distinction within Causality**

M Weber - 2022

The recent literature on causality has seen the introduction of several distinctions within causality, which are thought to be important for understanding the widespread scientific practice of focusing causal explanations on a subset of the factors that are ...

ИНТЕЛЛЕКТУАЛЬНЫЕ СИСТЕМЫ В ПРОИЗВОДСТВЕ

ПВ ПОЛУХИН - ИНТЕЛЛЕКТУАЛЬНЫЕ СИСТЕМЫ, 2022

В современных условиях развития методов и алгоритмов тестирования особую значимость представляет объединение отдельных компонентов тестирования в виде иерархической модели, отражающей связи и состояния между данными ...

[PDF] **Untersuchung des Effekts der Langzeiteinnahme von Protonenpumpenhemmern auf das Risiko für Herzinfarkt und Schlaganfall**

M Nolde - 2022

This cumulative dissertation deals with the question, whether proton pump inhibitor (PPI) intake affects the risk of myocardial infarction or ischaemic stroke. Observational studies had raised concerns that the intake of PPIs might increase the ...

[PDF] **Modality, expected utility, and hypothesis testing**

WJ Chung, S Mascarenhas

We introduce an expected-value theory of linguistic modality that makes reference to expected utility and a likelihood-based confirmation measure for deontics and epistemics, respectively. The account is a probabilistic semantics for deontics and ...

Knowledge generalization and the costs of multitasking

KG Garner, PE Dux - Nature Reviews Neuroscience, 2022

Humans are able to rapidly perform novel tasks, but show pervasive performance costs when attempting to do two things at once. Traditionally, empirical and theoretical investigations into the sources of such multitasking interference have ...

Our Genes: A Philosophical Perspective on Human Evolutionary Genomics

R Winther - 2022

Situated at the intersection of natural science and philosophy, Our Genes explores historical practices, investigates current trends, and imagines future work in genetic research to answer persistent, political questions about human diversity. Readers ...

[HTML] **The epistemological foundations of data science: a critical review**

J Desai, D Watson, V Wang, M Taddeo, L Floridi - Synthese, 2022

The modern abundance and prominence of data have led to the development of “data science” as a new field of enquiry, along with a body of epistemological reflections upon its foundations, methods, and consequences. This article provides a ...

[PDF] **The associations between depressive symptoms, functional impairment, and quality of life, in patients with major depression: undirected and Bayesian network ...**

J Zhou, J Zhou, L Feng, Y Feng, L Xiao, X Chen... - Psychological Medicine, 2022

Background Depressive symptoms, functional impairment, and decreased quality of life (QOL) are three important domains of major depressive disorder (MDD). However, the possible causal relationship between these factors has yet to be ...

Making individually fair predictions with causal pathways

Y Chikahara, S Sakaue, A Fujino, H Kashima - Data Mining and Knowledge ..., 2022

Abstract Machine learning is being increasingly used to make algorithmic decisions that have strong societal impact on people's lives. Due to their huge societal impact, such algorithmic decisions need to be accurate and fair with respect to sensitive ...

[PDF] **Prognostic Model of COVID-19 Severity and Survival among Hospitalized Patients Using Machine Learning Techniques**

I Lodato, AV Iyer, IZ To, ZY Lai, HSY Chan... - Diagnostics, 2022

We conducted a statistical study and developed a machine learning model to triage COVID-19 patients affected during the height of the COVID-19 pandemic in Hong Kong based on their medical records and test results (features) collected during their ...

[PDF] **Estimating Treatment Effects using Neurosymbolic Program Synthesis**

AG Reddy, VN Balasubramanian - arXiv preprint arXiv:2211.04370, 2022

Estimating treatment effects from observational data is a central problem in causal inference. Methods to solve this problem exploit inductive biases and heuristics from causal inference to design multi-head neural network architectures and regularizers ...

[PDF] **FED-CD: Federated Causal Discovery from Interventional and Observational Data**

A Abyaneh, N Scherrer, P Schwab, S Bauer... - arXiv preprint arXiv ..., 2022

Causal discovery, the inference of causal relations from data, is a core task of fundamental importance in all scientific domains, and several new machine learning methods for addressing the causal discovery problem have been proposed recently ...

[PDF] **Inflation: a Python library for classical and quantum causal compatibility**

EC Boghiu, E Wolfe, A Pozas-Kerstjens - arXiv preprint arXiv:2211.04483, 2022

We introduce Inflation, a Python library for assessing whether an observed probability distribution is compatible with a causal explanation. This is a central problem in both theoretical and applied sciences, which has recently witnessed ...

[PDF] **Hedging as Reward Augmentation in Probabilistic Graphical Models**

D Bhattacharjya, R Marinescu - Annual Conference on Neural Information ..., 2022

Most people associate the term 'hedging' exclusively with financial applications, particularly the use of financial derivatives. We argue that hedging is an activity that human and machine agents should engage in more broadly, even when the agent's ...

[PDF] From Causal Pairs to Causal Graphs

R Rashid, J Chowdhury, G Terejanu - arXiv preprint arXiv:2211.04312, 2022

Causal structure learning from observational data remains a non-trivial task due to various factors such as finite sampling, unobserved confounding factors, and measurement errors. Constraint-based and score-based methods tend to suffer from ...

Integration of AI for Clinical Decision Support

S Visweswaran, AJ King, GF Cooper - Intelligent Systems in Medicine and Health, 2022

Clinical decision support provides clinicians and patients with medical knowledge, information, and inferences that are designed to enhance decision-making in health and healthcare. Artificial intelligence (AI) enables computer systems to perform tasks ...

[PDF] Investigating methods for inferring causality from observational data: an application to longitudinal cohort data

ER John - 2022

In health services research, it is vital to know whether an event, such as treatment or modifiable exposure, has a causal effect on the outcome in order to deliver the best treatments and health policy interventions to patients and the public. Due to limited ...

[PDF] Compatibility of Cyclic Causal Structures with Spacetime in General Theories with Free Interventions

M Grothus - arXiv preprint arXiv:2211.03593, 2022

By relating and ordering events, causality constitutes a pivotal feature of our world. However, we distinguish between information-theoretic causality, covering operational information processing, and relativistic causality, limiting signalling to the ...

FOREIGN EXCHANGE MARKET LINKAGES, 2017-2019.

BD Deaton - International Journal of Accounting, Economics & ..., 2022

Three causal search algorithms are used to find the causal structure underlying the six most widely traded currencies (Australian dollar, Canadian dollar, euro, Great Britain pound sterling, Japanese yen, and United States dollar) in the years 2017 ...

[PDF] Risk Perception in Driving Scenes

N Agarwal, YT Chen

The holy grail of intelligent vehicles is to enable a zero collision mobility experience. This endeavor requires an interdisciplinary effort to understand driver behavior and to assess risks surrounding the vehicle. A driver's perception of risk is a complex ...