

Dimension Reduction and Representation Learning for Improved Estimation of Causal Parameters

S Son - 2026

High-dimensional observational data, including electronic health records and omics measurements, create substantial challenges for causal inference. The growing complexity of such data can hinder both estimation and interpretation. This ...

[PDF] Feedback loops and circular causality: a grammar to restore harmony to physiological systems

FC Argolo - einstein (Sao Paulo)., 2026

Causal inference and its graphical representation using directed acyclic graphs provide invaluable tools for calculating effects and handling confounding in medicine. However, since biological systems involve complex dynamics ...

Spurious Correlations From Supervised Models to Agentic Systems: Detection, Benchmarking, and Mitigation

Y Yang - 2026

Abstract Machine learning systems routinely succeed for the wrong reasons, relying on patterns that are predictive in the training data but incidental to the task, a spurious correlation that holds until it breaks. This dissertation argues that such ...

Quản lý rủi ro động đối với tiến độ thi công xây dựng: Khung lý thuyết tích hợp

NN Hùng, ĐT Ngọc, NH Hải, TQ Đức, NQ Toàn - Tạp chí Vật liệu và Xây dựng-Bộ Xây ..., 2026

Tóm tắt Rủi ro tiến độ thay đổi cùng điều kiện thi công và chịu ảnh hưởng của các biện pháp quản lý đã thực hiện. Bài báo đề xuất khung lý thuyết tích hợp để mô tả quá trình này, dựa trên tổng quan có chủ đích 34 tài liệu và phân tích khái niệm. Sáu ...

[HTML] Antecedents of Ecospirituality Across Cultures

MI Billet, A Baimel - Journal of Environmental Psychology, 2026

The idea that humanity and nature are spiritually connected—ecospirituality—is a core aspect of cultural and religious worldviews around the world. Sociocultural factors, like religion, urbanization, and socioeconomic status, are hypothesized to ...

[PDF] Horizon-aware goal-frontier maximization and the anti-monopolar property

T Lasser - 2026

We extend goal-frontier maximization (GFM) from myopic action evaluation to multi-step planning via a discounted value function over capability-poset trajectories. The self-balancing property transfers: destruction, coercion, and rigidity remain anti ...

[PDF] Regulatory Evolution of TEM β -lactamases through Large-Scale Genomic Analysis Reveals Promoter Diversity and its Impact on β -lactam Resistance in Escherichia ...

S Ramachandran, SA Chandran - 2026

Background: Antimicrobial resistance is a major global health threat, with β -lactamases representing the most prevalent mechanism of resistance to β -lactam antibiotics in Gram-negative bacteria. Among these, TEM β -lactamases (bla TEM) ...

[PDF] A Computational Systems Model of Multi-Level Governance for Human Flourishing Under Bounded Non-Exploitation

H Wang - 2026

Governance operates simultaneously across multiple levels—from local communities to national governments to international institutions—yet most formal governance models treat governance as a single-level phenomenon and permit jurisdictions to ...

[HTML] De la visión a las métricas: validación de los pilares del turismo sostenible en las empresas

I Travar, E Parra-López, VT Díaz-Padilla - PASOS Revista de Turismo y Patrimonio ..., 2027

Este estudio se basa en un enfoque novedoso del turismo sostenible a través del concepto de Cooperativa Turística (CT). Su fundamento teórico reside en la comprensión del mundo natural y del medio ambiente, así como en su interconexión ...

[HTML] The Tropical Order of Causal Sensitivity Domains: Corrected Statements and a Counter-Example to the Newton Polytope Conjecture

A Sabour - 2026

We study the asymptotic behavior of the causal diameter $\Delta_Q(\lambda)$ of a query (Q) under a constraint $(g(\alpha)\leq\lambda)$ on relaxation parameters. The relevant invariant is the tropical order $p_{\text{trop}}(v)$ of (g) in the direction (v) of the query ...

[PDF] Integrating Machine Learning and Reasoning for Clinical and Epidemiological Risk Assessment

P Ciunkiewicz - 2026

The increasing complexity and scale of biomedical data have necessitated the development of advanced computational methods to accurately assess and mitigate risk in various biomedical applications. This doctoral thesis investigates integrating ...

Building AI-Enhanced Decision Support Systems

J Ivković, JL Ivković, E Gurgu - AI and Human Expertise for Strategic Decision-Making

In the coming decade, AI decision support systems (DSSs) built for policy resilience across changing regimes will overtake today's AI-assisted DSSs centred on ever-larger large language models (LLMs) optimized for accuracy in calm conditions. If ...

[TXT] Evaluation of Potential Surrogate Endpoints Erin E. Gabriel A dissertation

PB Gilbert, H Janes, Y Huang

Evaluation of Potential Surrogate Endpoints Erin E. Gabriel A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy University of Washington 2012 Reading Committee: Peter B. Gilbert, Chair Holly Janes Ying Huang ...

[PDF] When Should a VLM Look? Paying Only for Visual Calls That Were Needed and Used

K Peng, J Liu, R He, Q Wang, J Qi, X Liu - arXiv preprint arXiv:2609.22910, 2026

Vision-language agents that crop and zoom are trained with rewards that credit a successful tool call, yet a successful call does not show that the model needed to look or used the pixels it received. On our cold-start checkpoint only 10% to 12% of ...

[Affrontare l'incertezza del mercato: il ruolo dell'innovazione aperta nello sviluppo dei sistemi informativi](#)

[S Tallarico, S Lazzini - Management Control, 2026](#)

In an economic context characterised by increasing turbulence and uncertainty, firms are called upon to develop adaptive strategies to sustain innovation and digital transformation processes. This study analyses the mediating role of Open Innovation ...

[\[HTML\] Complex Network Analysis Reveals Associations Between Physical Activity and Knee Arthroplasty Burden Across Brazilian State Capitals \(2009–2023\)](#)

[FSS Lisboa, IGM Reis, LA Silva, PPM Scariot... - Systems, 2026](#)

Highlights How the Work Links to Systems Science This study integrates demographic, cardiometabolic, behavioral, and socioeconomic indicators with TKA hospital outcomes through an undirected weighted complex network framework. The ...

[\[PDF\] The Evidence Ladder for Reinforcement Learning in Healthcare: From Retrospective Policies to Trusted Interventions](#)

[Y Zhao - arXiv preprint arXiv:2609.23374, 2026](#)

Reinforcement learning (RL) offers a natural language for healthcare decisions whose consequences unfold over time, yet most reported progress remains far from routine intervention. Existing surveys organize the field by algorithm or clinical ...

[\[HTML\] Equity-Aware Planning of Urban Ultra-Fast Electric Vehicle Charging Infrastructure with Spatial Graph Learning and Grid Constraints](#)

[H Wu, L Shi, X Gu, T Qian, M Fang - World Electric Vehicle Journal, 2026](#)

Urban ultra-fast-charging planning must connect equitable user service with physically deliverable charging power. This study formulates a heterogeneous graph linking demand zones, roads, candidate stations, and distribution buses, together ...

[\[PDF\] Hessian Rank Constraint for Learning Structure of Nonlinear Latent Variable Models](#)

[Z Li, R Cai, F Xie, X Dong, H Dai, Y Sun, Y Zheng... - arXiv preprint arXiv ..., 2026](#)

Uncovering latent variables and their causal relations from observed data is a fundamental yet challenging problem. Existing methods often rely on restrictive assumptions, such as linear relations or invertible mixing functions. To better address ...

[\[PDF\] Decoupled Causal Discovery](#)

[Z Guan, F Wu, K Kuang - arXiv preprint arXiv:2609.23535, 2026](#)

Causal discovery from observational data is a fundamental yet challenging task in scientific research. While existing approaches are primarily based on conditional independence tests, structure scores, or restrictive functional assumptions, we ...

[\[PDF\] ITSY: Causal Discovery From Irregular Time-Series Data](#)

[W Xu, Y He, Y Wang, Y Chen, K Kuang - arXiv preprint arXiv:2609.23516, 2026](#)

Structural causal models for time series recover contemporaneous and lagged effects, but most methods require complete observation windows and become misspecified when samples are missing. We introduce ITSY, the first continuous ...

[\[PDF\] Overcoming Model Misspecification in Bayesian Inference of Molecular Signalling Networks](#)

Y Li, H Kanagawa, FR Crucinio, MA Fisher, C Oates - arXiv preprint arXiv ..., 2026

Bayesian inference of molecular signalling networks usually relies on tractability of the marginal likelihood, enabling the set of possible networks to be efficiently explored. As such, linear models with independent errors and conjugate priors are ...

[\[PDF\] Causal Inference with Unobserved Confounding: A Mixture Learning Perspective](#)

M Sood, D Shah - arXiv preprint arXiv:2609.23219, 2026

Unobserved confounding is a fundamental challenge in causal inference from observational data. This article develops a mixture-learning perspective, viewing latent confounders as sources of heterogeneity that induce mixture structure in ...

[\[PDF\] Generating Chest X-Ray Counterfactuals by Specialising Foundation Image Models](#)

X Xing, RR Rasal, JA Meister, S Ghorayeb, G Khara... - arXiv preprint arXiv ..., 2026

Counterfactual image generation answers questions about how a subject would have looked under retrospective, hypothetical scenarios. Recent methods have improved perceptual quality, identity preservation and faithfulness to an underlying ...

[\[PDF\] Concept Drift from a Causal Perspective](#)

EVL Barboza, JP Barddal, R Sabourin, RMO Cruz - arXiv preprint arXiv:2609.25340, 2026

Concept drift is a common phenomenon in real-world data streams, in which changes in the data-generating distribution can degrade predictive model performance. Most existing definitions characterize drift as changes in the joint ...

[\[PDF\] Credit Access is Associated with Improved Food Security in the Horn of Africa](#)

J Cerdà-Bautista, V Sitokonstantinou, JMV López-Peña... - arXiv preprint arXiv ..., 2026

The intensification of climate change poses a growing threat to food security, especially in vulnerable communities. This study employs an observational machine-learning framework to estimate the causal association between access to credit and ...

[\[PDF\] Proxy-Adjusted Causal Discovery from Targeted Interventions](#)

L Chen, W Pan, X Shen - arXiv preprint arXiv:2609.23897, 2026

Randomized perturbations can reveal downstream responses without identifying which causal relationships are direct. Conditioning on intermediate responses may induce associations through unmeasured common causes, even when the source is ...

[\[PDF\] The Online Health Safety Gap: Consensus Alignment Does Not Imply Safety in Peer-to-Peer Health Narratives.](#)

O Clark, K Joshi, Z Ahmed - medRxiv, 2026

Online health information systems evaluate content by its alignment with medical consensus, treating that alignment as a reliable signal of safety. In peer-to-peer health discourse, that assumption fails: advice that is factually accurate is not ...

[\[PDF\] Bounding the Risk Difference Bias Given Incomplete Parameters for Externally Adjusting Uncontrolled Confounding](#)

OA Arah - arXiv preprint arXiv:2609.24999, 2026

Bias due to uncontrolled confounding can be analyzed using several external adjustment formulas. Like other bias expressions, the risk difference bias formula involving an uncontrolled polytomous confounder requires only three externally ...

[\[PDF\] Developing an AI Framework for Multimodal Medical Imaging Diagnostics based on Medical Data](#)

S Duan, MM Alobaedy, MK Chamran - JOURNAL OF SIMULATION, 2026

Artificial intelligence (AI) has been applied in medical diagnostics. There are still some challenges for AI clinical processing that need to be addressed. These challenges exist from the beginning when the AI model is designed. The main ...

[Advanced Analytics and Machine Learning for Strategic Insights: Technological Evolution and Social Transformation in the Era of Industrial and Social 5.0](#)

J Ivković - AI and Human Expertise for Strategic Decision-Making, 2027

How do data become social capital—more than a corporate asset, a measurable public good that improves health, equity, and sustainability? This chapter answers across four arcs. First, it tracks the analytic stack from OLAP and data mining to Big ...

[A Causally Informed CNN-Ensemble Fusion Framework for Reddit-Based Mental Health Using Textual, Temporal, and Metadata Features](#)

U Nazir, NS Kamarudin, MA Majid, R Moraffah... - 2026 IEEE 1st International ..., 2026

Social media offers large-scale textual data on social indicators of distress, support-seeking and disclosure of psychological crises. Nevertheless, most mental health classification systems remain prediction focused and offer little information about ...

[Autonomous AI Decision Control Tower: A Deterministic Multi-Agent Decision Intelligence Framework for Enterprise NoOps](#)

T Singh - 2026 IEEE 1st International Conference on Artificial ..., 2026

The contemporary paradigm shift toward true “NoOps” environments necessitates an epistemological transition from traditional reactive monitoring to a regime of proactive, high-dimensional reasoning. This paper introduces the Autonomous AI ...

[\[PDF\] A Categorical Reconstruction of Meta-Laws: A Philosophical Perspective on the MLO Structure](#)

X Meng - 2026

This paper undertakes a philosophical investigation of the relationship between meta-laws, first-order laws, and observational conditions, and provides a categorical formalization of that relationship. We begin by establishing a four-quadrant ontology ...

[\[PDF\] Towards Self-Healing Networks: AI-Based Log Analytics and Automated Remediation](#)

C Feng - 2026

The rapid growth in network complexity and scale, driven by cloud adoption, IoT proliferation, and hybrid infrastructures, has outpaced traditional, manual network management methodologies. Current approaches exhibit significant shortcomings ...

[PDF] From Biological Mechanisms to Causal Inference: Quantitative Systems Pharmacology and Causal Frameworks in Drug Development

T Klabunde, R Hernandez, PH van der Graaf... - *Clinical Pharmacology & ...*, 2026

Digital patients and in silico clinical trials offer new opportunities to advance pharmacological research, clinical development, and regulatory decision-making by enabling the simulation of treatment effects prior to testing in patients. Among the ...

[HTML] A distributional perspective on Pearl's causal hierarchy: From marginal to joint and individualized potential outcomes

P Wu, L Wang - *Statistical Learning and Data Science*, 2026

Pearl's causal hierarchy is a foundational lens for formulating causal questions and is most often discussed within the framework of structural causal models. We recast the hierarchy in potential outcomes language and make its information ordering ...

[PDF] Visual and Algorithmic Explanations to Fortify AI Safety

S Lee - 2026

As modern AI systems, such as diffusion-based generative models or large language models (LLMs), continue to grow in scale, complexity, and societal impact, understanding and mitigating their risks has become increasingly urgent yet ...

Scientific reliability of physics-informed foundation models for engineering: a critical review, evidence-based assessment framework, and future research roadmap

A Karkadakattil - *Machine Learning for Computational Science and ...*, 2026

Physics-informed foundation models are emerging as a promising approach to engineering artificial intelligence by combining large-scale representation learning with physical knowledge across computational mechanics, materials engineering ...

[HTML] Causal project analytics for open-source software ecosystems: an auditable causal machine learning pipeline for risk identification and decision support

BD Assefa, H Wicaksono - *Journal of Open Innovation: Technology, Market, and ...*, 2026

Software project decisions in distributed and open-source settings often rely on correlations that offer limited guidance for intervention. We propose a causal analytics pipeline that combines literature-informed priors, causal discovery ...

[HTML] BriDGE the gap: Improving behavioral research by integrating DAGs and GAMs into experiments

GA Veltri, S Banerjee - *Behavior Research Methods*, 2026

Understanding the mechanisms through which behavioral interventions work remains a critical challenge in behavioral science. While randomized controlled trials (RCTs) provide reliable evidence for intervention efficacy, they are seldom designed ...

[PDF] Making, Updating, and Querying Causal Models with CausalQueries

T Tietz, L Medina, G Syunyaev, M Humphreys - *Journal of Statistical Software*, 2026

The R package CausalQueries can be used to make, update, and query causal models defined on binary nodes. Users provide a causal statement of the form $X \rightarrow M \leftarrow Y$; $M \leftarrow Y$ which is interpreted as a structural causal model over a collection of ...

Identifying causes of treatment effect heterogeneity across replication studies: Definitions, identification, and estimation of remaining heterogeneity.

S Park, S Pohl, PM Steiner - *Psychological Methods*, 2026

Replication studies are crucial for evaluating treatment efficacy and exploring the conditions that moderate treatment effects. Understanding this treatment effect heterogeneity across studies is essential for building robust theories. However ...

[HTML] Factors Affecting Fish and Amphibian Habitats Under Different Erosion Control Dam Types with Implications for Forested Mountain Stream Management: A Case in a ...

SI Lee, JI Seo, SM Kwon, J Lee - *Forests*, 2026

Erosion control dams (ECDs) in forested mountain streams are key pieces of infrastructure for disaster risk reduction, but they have also been reported to disturb the hydro-geomorphic balance of stream ecosystems. Open-type ECDs have ...

[PDF] From Biological Mechanisms to Causal Inference: Quantitative Systems Pharmacology and Causal Frameworks in Drug Development

T Klabunde, R Hernandez, PH van der Graaf... - *Clinical Pharmacology & ...*, 2026

Digital patients and in silico clinical trials offer new opportunities to advance pharmacological research, clinical development, and regulatory decision-making by enabling the simulation of treatment effects prior to testing in patients. Among the ...

[PDF] What Moves the System: A Factor Map and Ranking for European Digital Sovereignty

S Fermigier - 2026

The instruments deployed for digital-sovereignty policy score nodes: an organisation's resilience, a supplier's posture, an offer's compliance level. The published indices describe levels. Neither says what makes the sovereignty of the ...

[HTML] A distributional perspective on Pearl's causal hierarchy: From marginal to joint and individualized potential outcomes

P Wu, L Wang - *Statistical Learning and Data Science*, 2026

Pearl's causal hierarchy is a foundational lens for formulating causal questions and is most often discussed within the framework of structural causal models. We recast the hierarchy in potential outcomes language and make its information ordering ...

Collaborative Representations for Targeted Causal Inference Under Outcome Selection

J de Aguas - *Joint European Conference on Machine Learning and ...*, 2026

Estimating causal effects with missing outcomes requires learning outcome, exposure, and selection models. Flexible propensity learners can predict treatment or missingness well while worsening target estimation by emphasizing instruments ...

On Causal and Agentic AI: An Integrative Conceptual and Foundational Perspective

J Treur - *International Conference on Computational Collective ...*, 2026

Causal AI and agentic AI currently get much attention to carry a next wave of development for AI. This paper addresses a conceptual and formal analysis of the underlying concepts of causality and agency and how they integrate. It is analysed ...

CAR-MNAR: A Unified Factorial Framework for Robust Causal Discovery Under Self-masking MNAR

M Alinejad, K Hlaváčková-Schindler - ... *Machine Learning and Knowledge Discovery in ...*, 2026

Causal discovery from observational data is fundamental to scientific inference, yet real-world datasets are rarely complete. The Missing Not At Random (MNAR) regime, where missingness probability depends on unobserved values can fatally ...

Reward Optimizing Recommender Systems

D Rohde - *Proceedings of the 20th ACM Conference on ...*, 2026

A quote often (mis) attributed to Einstein states: "If my life depended on solving a difficult problem in one hour, then I would spend fifty-five minutes defining the problem, and only five minutes finding the solution." An implicit consensus ...

Identifying Causal Drivers of Telecommunications Customer Churn: A Double/Debiased Machine Learning and Bayesian Multilevel Approach

NH Chau - *International Conference on Computational Collective ...*, 2026

Customer churn is a critical threat to profitability in the telecommunications sector, yet most existing approaches focus on prediction rather than causal explanation. This paper proposes a framework combining Double/Debiased Machine Learning ...

Navigating the Polycrisis: A Theoretical and Empirical Framework for AI-Augmented Financial Risk Management in Geopolitically Exposed Emerging Markets

AT Karnawat, S Agarwal, R Limbad, S Chachad... - *Global Business Strategy in ...*, 2027

Developing economies are particularly prone to polycrisis risk given their inherent fragilities, volatile capital flows, and exposure to geopolitical events. The financial risk methodologies, such as value at risk modeling and linear econometric ...

Causal-Interventional Robust Beamforming for Ghost Target Mitigation in ISAC Systems

Z Ling, Z Mao, L Shi, S Sun - ... *25th International Symposium on Communications and ...*, 2026

Integrated sensing and communication (ISAC) sensing is vulnerable to multipath-induced ghost targets whose range-angle-Doppler signatures can resemble genuine objects. This paper proposes a causal-interventional robust beamforming framework ...

Interpretable Ensemble Learning Framework for Predictive Maintenance with Causal and Counterfactual Insights

JT Koshy, S Anand, A Mohanty - 2026 International Conference on Computing ..., 2026

Unplanned equipment malfunction within manufacturing environments has considerable economic and safety ramifications, leading to early fault detection being vital. In this paper, we introduce a stacked ensemble method in predictive ...

[PDF] Disability-Inclusive Employment and Company Value Proposition Enactment: A Qualitative Framework from a Sri Lankan Service-Sector Case

NCM Arachchige - Asian Journal of Marketing Management, 2026

Purpose: This study develops a contextually grounded framework explaining how disability-inclusive employment may contribute to company value proposition enactment within a high-contact service organisation in Sri Lanka. It shifts attention ...

[PDF] EVALUATING THE IMPACT OF BIOMANIPULATION ON WATER CLARITY IN LAKE EYMR VIA BAYESIAN INFERENCE

G Aydın - 2026

This study quantified the effect of biomanipulation (benthi-planktivorous fish removal) on water clarity in Lake Eymir, and the pathways transmitting it, using a Bayesian hierarchical model (BHM) structured on a directed acyclic graph (DAG). Accounting ...

[PDF] Structure Learning in Bayesian Networks: From Personality Modeling to Scalable Algorithms

C Fernandopulle - 2026

Bayesian network structure learning provides a powerful framework for uncovering conditional dependency relationships in complex multivariate systems. However, its application presents two major challenges: interpreting dependency structures in ...