[HTML] Anomaly detection and root-cause identification in microservices: a survey

LM Barata, S Sequeira, E Lopes, PRM Inácio… - Cluster Computing, 2026

Microservices Architecture (MSA) has emerged as a dominant paradigm for building scalable and flexible distributed systems. By decomposing applications into loosely coupled services, MSA improves modularity and deployment agility, but also …

[PDF] A semantics for counterfactuals in quantum causal models

A Kooderi Suresh, M Frembs, EG Cavalcanti - New Journal of Physics, 2026

We introduce a formalism for the evaluation of counterfactual queries in the framework of quantum causal models, generalising Pearl's semantics for counterfactuals in classical causal models, thus completing the last rung in the …

[PDF] A Model for the Development of Alzheimer's Disease

Z Huang, X Mu, Q Chen, L Zhong, J Xiao, C Zuo… - Genomics, Proteomics & …, 2025

Intracellular alkalosis and extracellular acidosis are well-established characteristics of Alzheimer's disease (AD). We present a computational analysis and modeling of transcriptomic data of AD tissues, aiming to understand their causes and …

[HTML] Decoding the Conversion Gap in SME Digital Transformation: A Causal AI Framework

J Park - Systems, 2026

Despite the proliferation of digital integration initiatives, many Small and Medium-sized Enterprises (SMEs) remain trapped in a persistent “Conversion Gap,” where digital adoption fails to manifest as tangible financial performance. Grounded in …

Machine learning for prediction of weaning and extubation from mechanical ventilation: a systematic review of methodology, reporting and bias

M Murali, DS Dave, O Serban, M Ni, P Ramnarayan… - BMJ Digital Health & AI, 2026

Objective Systematic review to assess methodology and quality of reporting for studies applying machine learning (ML) to develop prediction models for weaning and extubation from invasive mechanical ventilation. Methods and analysis A …

Fractal Based Diffusion Modeling and Development of Physical Reservoir Computing Performance Metrics

MA Carvajal - 2026

This study first investigates and develops models for fractal based structures. Fractal structures are characterized by the self-similarity they exhibit at different length and time scales. This self-similarity can be characterized using a measure called the …

Hierarchical Nonlinear Flow-based Causal Representation Learning for Diffusion-based Counterfactual Generation

J Zheng - 2026 11th International Conference on Intelligent …, 2026

Causal representation learning aims to recover latent factors that support intervention and counterfactual reasoning. Existing VAE-based causal models are limited in modeling nonlinear causal mechanisms, while diffusion models produce …

Homelessness, Mental and Physical Health as Risk Factors in Labor Trafficking and Exploitation: A Path Analysis With a Sample of US Citizens

FT Hoque - 2026

Research on labor trafficking and exploitation has been highly population-specific, focusing on particular industries, demographic groups, or geographic regions. Drawing on survey data collected from a sample of US citizens located in four US …

[PDF] The Mathematics of Large Language Models I

MN i Alonso - 2026

We identify the exact population log-loss cost of replacing the full context X by a structural projection T= τ (X) in autoregressive next-token prediction. For any measurable T, the excess optimal log loss equals the conditional mutual information I …

[PDF] Canada's Energy Transition and the Role of Computational Consequence Mapping: An Analysis Using the AMuN Decision Intelligence Framework

A Tammam - 2026

Canada faces a multi-dimensional energy crisis characterized by fragmented provincial grid infrastructure, severe energy poverty in remote and Indigenous communities, rapidly escalating data centre electricity and water demand, a …

Синтез субъектно-деятельностного и казуального подходов для осмысления процесса профессионализации современных аспирантов

СВ Пивнева - Bulletin of Pedagogical Sciences, 2026

в статье рассматриваются два принципиально дополняющих друг друга методологических подхода к педагогическому сопровождению и исследованию процесса профессионализации аспирантов: субъектно-деятельностный (activity …

[PDF] The Two-Gap Theory of Irrationality: Evidence Perception, Belief Integrity, and Diagnostic Repair

P Stilwell

The term" irrational" compresses several structurally different epistemic failures into one blunt label. A person may be wrong because they lack access to relevant evidence, misunderstand a base rate, trust a bad source, or use weak inferential …

[TXT] Published as a conference paper at ICLR 2019 GAN DISSECTION: VISUALIZING AND UNDERSTANDING GENERATIVE ADVERSARIAL NETWORKS

D Bau, JY Zhu, H Strobelt, B Zhou, JB Tenenbaum…

Published as a conference paper at ICLR 2019 GAN DISSECTION: VISUALIZING AND UNDERSTANDING GENERATIVE ADVERSARIAL NETWORKS David Bau1,2, Jun-Yan Zhu1, Hendrik Strobelt2,3, Bolei Zhou4, Joshua B. Tenenbaum1, William T …

[PDF] MCSBench: Probing Multimodal Conceptual Structure of Multimodal LLMs

S Zhang, M Fu, K Yu, T Zheng, G Chen, H Jiao, S Khan… - Third Workshop on Visual …

Do multimodal LLMs (MLLMs) understand concepts structurally like humans? Inspired by cognitive principles, we formalize\emph {multimodal conceptual structure}(MCS) as the relational organization grounded in concept-attribute …

[PDF] ABLE: Choosing Perturbation Experiments to Recover Gene Logic

YJ Phua, FW Ten - ICML 2026 AI for Science Workshop

Scientific knowledge requires claims stated formally, checked against evidence, and paired with what remains undecided. Perturb-seq and CRISPR screens promise genome-scale interventional data, yet current machine-learning tools return ranked …

[PDF] Rethinking Intelligence in Machines.

NB Fardeen

It's with great happiness that, I would like to acknowledge a great deal of people that get helped me extremely through the entire difficult, challenging, but a rewarding and interesting path towards some sort of Edited Book without having their help and …

[PDF] Trajectory-Based Anticipation of Hospital Crises via Decision-Oriented Neuro-Symbolic AI

K AL KHATIB, B HUSSEIN, P CAULIER, S CHAABANE

Hospital crises rarely emerge as isolated events; they evolve as progressive trajectories of fragilization in which pressure accumulates, instability increases, and decision windows gradually close. Yet most operational AI remains event-centric …

[PDF] Inside the Visual Mind: Neuroscience-Motivated Concept Circuits for Interpreting and Steering Vision Transformers

T Li, Y Chen, M Ma, X Peng - arXiv preprint arXiv:2606.06664, 2026

Despite high accuracy, Vision Transformer (ViT) predictions can be driven by spurious cues, raising the need to understand their inner workings before safe deployment. Sparse autoencoders (SAEs) provide a promising lens for decomposing …

Beyond shortcuts: Mitigating spurious correlations in radiological diagnosis with causal intervention

X Zeng, J Wang, J Zhang, Y Dong, W Wang, Y Jiang… - Knowledge-Based Systems, 2026

While deep learning models show promise in radiological diagnosis, their clinical utility is limited by a lack of robustness and fairness. This challenge may arise in part from their tendency to exploit shortcut cues associated with sensitive patient …

[PDF] Does Topic Sentiment Cause Perceived Ideology? Comparing Human and LLM Annotations in Political News Articles

U Chatterjee - arXiv preprint arXiv:2606.06715, 2026

We ask whether topic sentiment has a causal effect on perceived political ideology, and whether the answer depends on who assigns the ideology label. Using articles from AllSides, paired with shared sentiment annotations from Llama-3.3-70b …

[HTML] The role of accessibility in mitigating the risk of transport-related social exclusion: Evidence from Fortaleza, Brazil

MFM de Oliveira, CFG Loureiro, DB Tomasiello - Journal of Transport Geography, 2026

Abstract Many Latin American cities are characterized by a scenario of socio-spatial segregation of disadvantaged groups. This segregation prevents them from participating in the social life of their communities due to, notably, reduced or even …

MINE-WD: Dynamic Feature Selection with Stabilized Mutual Information Neural Estimation and Wasserstein Distance Regularization

MZ Amir, J Chu, KB Brohi, MJ Khamis, T Li - Expert Systems with Applications, 2026

The current industrial data is characterized by a more sophisticated interaction, which restricts the use of traditional dynamic feature selection when estimating mutual information is unreliable and inconsistent predictions. In this paper, we …

Koopman–PCE-based confidence-bounded fault diagnosis and recovery for hydrogen demand tracking in a membrane reactor

S Santra - Computers & Chemical Engineering, 2026

Actuator loss-of-effectiveness (LOE) faults and matched disturbances can severely degrade tracking performance in nonlinear control affine systems, especially when the fault severity and disturbance bounds are unknown. This paper develops a fault …

Directed information

D Tsur, O Sabag, N Kashyap, H Permuter, G Kramer - Foundations and Trends® in …, 2026

Directed information (DI) is an information measure that attempts to capture directionality in the flow of information from one random process to another. The definition of DI, in its present form, is due to Massey (1990), but the origins can be …

[PDF] Impostor Syndrome as a driver of burnout: A Bayesian latent trait analysis among early-career researchers

CS Gondos, G Piracci, M Casati, E Castellari… - Q Open, 2026

Work-related burnout is increasingly prevalent in modern society, with certain professionals, such as academics, particularly at risk. Although adverse working conditions are often considered the primary cause, individual psychological factors …

[PDF] polyDAG: Polynomial Acyclicity Constraints for Efficient Continuous Causal Discovery in Visual Semantic Graphs

W Zhang, R Ramezani, T Han, K Hwang, M Guo - arXiv preprint arXiv:2606.06908, 2026

Modern image-analysis pipelines often convert images into structured semantic variables, such as facial attributes, object concepts, and scene descriptors. Learning directed dependencies among these variables can produce interpretable visual …

[PDF] Beyond Post-hoc Explanation: Toward Glassbox AI via Probabilistic Mediation

M Leonelli - arXiv preprint arXiv:2606.07113, 2026

Large language models are rapidly becoming infrastructural components in high-stakes institutional settings, including public administration, legal reasoning, and healthcare, where opacity is not merely inconvenient but institutionally and legally …

[HTML] Integrative Neurobiology and Cultural Context Theory: The Role of Cultural Neurobiological Inheritance Systems

DO Larson, I Sarto-Jackson, B Fischer - Biological Theory, 2026

In this reflection article, we present a new theoretical perspective, which we term integrative neurobiology and cultural context (INCC) theory. Traditionally, social scientists have viewed the human brain as a “black box” of behavior. At the same …

[PDF] CausalAlpha: A Real-Time Geopolitical Risk Index from OSINT Channels for Causal Discovery in Financial Markets

A Azqueta-Gavaldon, B Ureta - arXiv preprint arXiv:2606.07049, 2026

We introduce CausalAlpha, an open-source framework that constructs a high-frequency Geopolitical Risk (GPR) index from Telegram OSINT channels using natural language processing, and applies causal discovery methods to identify the …

[PDF] When seasonal structure dominates: rethinking causal attribution in environmental epidemiology

E Häggström Gunfridsson - Frontiers in Epidemiology, 2026

Reproducibility is widely treated as evidence of reliable causal inference in environmental epidemiology. Yet in environmental time-series studies, exposures, behaviours, and mortality often share strong seasonal structure, making causal …

[PDF] A regime-specific mechanism portfolio for arsenic mobilization in coastal Bangladesh

MR Hasan, S Zubyer, MAK Rupa, FZ Arabi, A Zahid - 2026

Coastal Bangladesh groundwater shows a freshening-plus-anthropogenic-loading paradox: median decadal $\Delta Cl = -42$ mg L^{-1} ($p < 10^{-4}$) while HCO_3, PO_4 and SO_4 rise significantly (+ 65,+ 0.45,+ 2.25 mg L^{-1}; all $p < 10^{-3}$), inverting the …

[PDF] Mobility, Election Administration, and Democracy in America

J Griffiths - 2026

In this dissertation, I examine the relationship between residential mobility, election administration, and political participation. In the first chapter, I provide an overview of the literature on the participatory effects of moving and discuss patterns in residential …

[PDF] Coverage Crystallization and Structural Contradiction: A Naturalized Reconstruction of the Genesis of Dialectical Contradiction

H Cai - 2026

Dialectical logic has long faced a foundational difficulty: how to provide a non-circular, empirically inspectable account of the genesis of dialectical contradiction--one that does not presuppose the very universality it seeks to explain. This paper …

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JW Mueller

Flexible models for understanding and optimizing complex populations by Jonas W. Mueller Submitted to the Department of Electrical Engineering and Computer Science in partial fulfillment of the requirements for the degree of Doctor of …

[TXT] Constrained, Causal, and Knowledge-Grounded Reasoning for Neural Language Generation Lianhui Qin A dissertation

Y Choi, L Zettlemoyer, F Xia, O Etzioni, L Qin

Constrained, Causal, and Knowledge-Grounded Reasoning for Neural Language Generation Lianhui Qin A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy University of Washington 2023 …

[PDF] Structured Behavioral Heterogeneity as Latent Regime Constraints

Y Yan, H Gao, X Chen, Y Fu, S Li - Decision-Making from Offline Datasets to Online …

Sequential decision data often exhibit structured behavioral heterogeneity: similar observed conditions can lead to different actions across trajectories and time. Standard approaches typically attribute this variation to drifting rewards or …

[PDF] Counterfactuals Without Evaluation: Admissibility, Co-satisfiability, and the Structural Source of Instability

D Ito

Counterfactual conditionals occupy a central position in philosophical analysis, yet attempts to provide a stable account of them have repeatedly failed to converge. Refinements of similarity relations, background conditions, causal dependencies …

[TXT] DOCTOR OF PHILOSOPHY at the MASSACHUSETTS INSTITUTE OF TECHNOLOGY September 2024© 2024 Sarah H. Cen. All rights reserved.

SH Cen

Paths to AI Accountability: Design, Measurement, and the Law by Sarah H. Cen BSE, Princeton University (2016) M.Sc. by Research, University of Oxford (2018) Submitted to the Department of Electrical Engineering and Computer Science in partial fulfillment …

[PDF] SwarmProbe: Explainability Analysis of Multi-Agent Systems via Emergent Behavior Probing

Y Zhou, T Xia, L Ren, J Liao, F Chang, X Huang

As large language model (LLM)-based multi-agent systems are increasingly deployed in production environments, understanding how collective behavior patterns develop over the course of agent interactions remains an open challenge …

[PDF] Projective Process Monism: A Geometric Framework for Physics, Measurement, and the Observer

J Wozniak

Phenomenal experience has the geometry of real projective three-space, RP^3, established by phenomenology and supported by psychophysical experiment. This document takes that observation as a physical constraint and works out what reality …

[PDF] Weighting in marginal structural models with intermediate confounder-mediators in longitudinal studies

F Xia, JP Hughes, KCG Chan, D Donnell - Biostatistics & Epidemiology, 2026

In longitudinal settings, conventional regression methods that adjust for confounding may not be directly applicable when treatment and confounders are both time-varying, and some confounders are also in the treatment pathway. Marginal …

[PDF] WorldKernel: A World Model is the Coupling Kernel of Admissible Possible Worlds

F Rovai - arXiv preprint arXiv:2606.10934, 2026

A common assumption holds that enough observational and interventional data, given to a strong enough predictor, suffices. We report a failure mode that contradicts it. Across hundreds of structural causal models, on identified quantities a strong …

[TXT] TEKNILLINEN KORKEAKOULU Tuotantotalouden kirjasto

H Koponen, B Interlocks

Aalto University School of Science Degree Programme in Industrial Engineering and Management Henri Koponen Active Owners, Board Interlocks, and Corporate Governance TEKNILLINEN KORKEAKOULU Tuotantotalouden kirjasto Thesis submitted …

[TXT] c© Copyright 2020 Fan Xia Mediation Analysis with Complex Intermediate Causal Structure Fan Xia A dissertation

KCG Chan, TS Richardson, JP Hughes

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[HTML] The suicidal process after a recent suicide attempt: A combined undirected and directed network approach on cross-sectional data

A Amaro, RC O'Connor, S Cleare, D de Beurs - Behaviour Research and Therapy, 2026

Suicide is a complex phenomenon arising from the interactions of multiple risk factors, with risk particularly elevated following a recent suicide attempt. The Integrated Motivational-Volitional (IMV) model provides a comprehensive theoretical …

[PDF] An Integrated Sample Reweighting and Sparse Feature Learning Method for Frequency Security Assessment in Power Systems

Y Shi, J An, Y Zhou - Journal of Modern Power Systems and Clean Energy, 2026

With the increasing integration of renewable energy sources into power systems, frequency security assessment (FSA) methods based on machine learning has attracted increasing attention. However, such methods are often misled by spurious …

[PDF] Collaborate and explain on-the-fly: knowledge-based reasoning and learning in ad hoc teamwork

H Dodampegama, M Sridharan - Frontiers in Artificial Intelligence, 2026

This paper focuses on ad hoc teamwork, the problem of enabling an AI agent to collaborate with other agents without prior coordination. Methods considered state of the art for ad hoc teamwork formulate it primarily as a learning problem, using a large …

[HTML] Sex-Based Differences in the Physical Capacity Profile of Regional Fencers

J Gaviria Chavarro, ÓH Jiménez Trujillo… - Sports, 2026

Fencing is an intermittent combat sport in which performance depends on the interaction of neuromuscular qualities, aerobic support, and weapon-specific demands. However, evidence on sex-based differences in the physical capacity …

[PDF] Modeling Rare Events and Nonmonotone Nonignorable Missingness of Time-Varying Outcomes and Predictors in Binary Time-Series Daily Diary Data: A Bayesian …

SJ Cho, A Kujawa, C Carlton, Y Long, R Marlowe - Psychometrika, 2026

This study investigates the relationship between daily interpersonal stress (binary, time-varying) and suicidal behavior (binary, time-varying) using 90 days of daily diary data from 106 adolescents assessed immediately after discharge from acute …

[PDF] Towards personalised intervention: A causal-dynamical framework to determine psychological treatment trajectories

L Waldorp, T MÃžrtz, A Jansen, J Haslbeck - arXiv preprint arXiv:2606.09283, 2026

For approximately half of the individuals receiving mental health care, the results are suboptimal, even when treatments align with evidence-based guidelines. These limited effects may partly stem from how clinical decisions on treatment focus are …

[PDF] Beyond Probabilistic Similarity: Structural, Temporal, and Causal Limitations of Retrieval-Augmented Generation in the Legal Domain

H de Martim - arXiv preprint arXiv:2606.09724, 2026

Retrieval-Augmented Generation (RAG) has become a standard architectural response to unreliability in legal AI, yet high-profile failures, including fabricated citations submitted to courts and anachronistic legal content presented as current …

[PDF] Causal Ensemble Agent: Hierarchical Causal Discovery with LLM-guided Expert Reweighting

X Li, Y Wang, H Li, C Zhou, E Gao, B Han, T Liu… - arXiv preprint arXiv …, 2026

Causal discovery aims to uncover causal structures from observational data, which is crucial for real-world decision-making. However, different causal discovery algorithms can produce divergent results that conflict with each other, complicating …

[PDF] Inside the Latent Flow: Causal Deciphering of Attention Dynamics in Audio Separation Foundation Models

Y Chen, H Xu, P He - arXiv preprint arXiv:2606.10046, 2026

Flow-matching transformers achieve strong audio separation, yet their attention dynamics are opaque. We adapt established causal-intervention principles into a deterministic, inference-time probing protocol for SAM Audio. Orthogonal probing …

[PDF] Topological Effective Connectivity Modeling in Brain Networks

A El-Yaagoubi, MK Chung, H Ombao - arXiv preprint arXiv:2606.08407, 2026

Characterizing directed information flow in brain networks is difficult because neural circuits are full of recurrent feedback loops. Many existing tools for directed dependence assume a directed acyclic graph (DAG) structure to resolve directional …

[PDF] Empirical stratification for treatment effect heterogeneity with post-treatment variables

C Cheng, R Wang, Y Zhang - arXiv preprint arXiv:2606.11013, 2026

Post-treatment variables (PVs), such as treatment noncompliance, behavioral responses, intercurrent events, often modify the ultimate treatment effect on the primary outcome. However, existing methods provide limited tools for studying …

[PDF] Limited belief propagation and contingent thinking

A Ellis, R Spiegler - arXiv preprint arXiv:2606.10681, 2026

An agent updates her beliefs over a set of variables after observing some of them. We provide a representation of updated beliefs that captures limited propagation of her observation's implications through the directed acyclic graph that represents the …

[PDF] $100\pm\Delta t $ Years of Quantum Uncertainty: From Origins to Modern Insights

LO Conlon, B Shajilal, J Zhao, TC Ralph, G Leuchs… - arXiv preprint arXiv …, 2026

Heisenberg's uncertainty principle is a cornerstone of quantum mechanics, marking a decisive departure from classical physics. Conceived almost a century ago through a thought experiment showing that measuring an electron's position inevitably …

[PDF] Vector Space of Cycles

MK Chung, AB El-Yaagoubi, H Ombao - arXiv preprint arXiv:2606.08202, 2026

Most statistical and machine learning methods for directed interactions focus on pairwise effects among variables. Even existing cyclic models represent feedback primarily through node-level dependencies, making large-scale recurrent …

[PDF] Observability for Delegated Execution in Agentic AI Systems

A Mishra, K Sharad - arXiv preprint arXiv:2606.09692, 2026

Delegation-scoped execution is not identifiable from standard observables: audit logs and execution traces can be identical under multiple incompatible delegation assignments. This gap is especially acute in LLM-based agentic systems, where …

[PDF] Instrumented data for causal scientific machine learning

DN Wilke - arXiv preprint arXiv:2606.07865, 2026

Scientific machine learning is limited less by model size than by the data it is trained on. Observational data records what happened but not why; template synthetic data has a known generating process but only for the simulator's template, not the case a …

[PDF] Beyond Additivity: Causal Discovery in Location-Scale Noise Models with Hidden Variables

M Khan, S Shimizu, T Pham - arXiv preprint arXiv:2606.08196, 2026

We study causal discovery from observational data when some variables are hidden and the data-generating process follows a location-scale noise model (LSNM). Existing methods that handle hidden confounders typically assume additive noise …

[PDF] WorldKernel: A World Model is the Coupling Kernel of Admissible Possible Worlds

F Rovai - arXiv preprint arXiv:2606.10934, 2026

A common assumption holds that enough observational and interventional data, given to a strong enough predictor, suffices. We report a failure mode that contradicts it. Across hundreds of structural causal models, on identified quantities a strong …

[PDF] Estimate Collapsibility of Causal Effects in Completed Partial DAGs via Strong d-Convex Hulls

Y Deng, Y Sun, Z Li, H Liu - arXiv preprint arXiv:2606.08941, 2026

This paper proposes a collapsible method for estimating causal effects that maintains the estimator's consistency before and after marginalization over some variables in completed partially directed acyclic graphs (CPDAGs). We first introduce the estimate …

[PDF] Global variation in cardiometabolic risk structures: A 48-country comparative Bayesian network analysis in 146,000 participants using WHO STEPS data

MA Babagoli, MJ Beller, M Scutari, JP Gonzalez-Rivas… - medRxiv, 2026

Background Cardiometabolic-based chronic disease (CMBCD) at an individual level results from complex interactions among a multi-tiered network of sociodemographic, behavioral, and metabolic factors. Though a consensus set of risk factors drives …

[PDF] Logical Approaches to Dynamical Structures in Artificial Intelligence

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This PhD thesis studies logical frameworks for interaction and learning, with applications in causal reasoning and learning games, where either the domain of interaction is graphstructured, or the outcome of learning is represented as a graph …

[HTML] Towards Data-Driven Sustainability: The Impact of Data Elements on Urban Green Total Factor Productivity

X Wang, K Wang, Q Tang, S Hu - Systems, 2026

As green and sustainable development has become a central policy objective, identifying new drivers of urban green total factor productivity (GTFP) is of growing importance. This study examines whether data-element development is associated …

[HTML] Evidence-based AI: from trailblazer to trustblazer?

T Luechtefeld, T Hartung - Frontiers in Artificial Intelligence, 2026

Agentic AI systems can plan, call tools, and coordinate specialized sub-agents, enabling multi-step scientific workflows that exceed what single-model text generation can reliably deliver. Yet in high-stakes domains such as regulatory …

Causal-siamese: similarity-based treatment effect estimation with limited data

IE Livieris, N Kiriakidou, C Diou - Evolving Systems, 2026

Nowadays, treatment effects estimation has been the primary objective in various application domains including, for example, healthcare, finance and marketing. Nevertheless, the available data is scarce and the task of obtaining additional …

[HTML] Counterintuitive causal structures in inter-chip photonic quantum computing

Y Wang, Y Wang, D Wang, J Wu - Optics Express, 2026

Causal theory provides a consistent framework for describing relations among events or variables, and has recently been applied to quantum systems. Here, we apply causal analysis to the remote-controlled quantum computing model and …

[PDF] How Requirements Quality Makes (or Breaks) Traceability Link Recovery

T Hey, J Frattini - arXiv preprint arXiv:2606.11834, 2026

Traceability information between requirements and source code greatly benefits the maintenance of a software system. Since manually establishing trace links is cumbersome and error-prone, previous research explored automated traceability link …

[PDF] The Impossibility of Eliciting Latent Knowledge

K Friedl, FR Ward, PY Rapoport, T Everitt, J Richens - arXiv preprint arXiv …, 2026

Advanced AI systems have extensive knowledge of their environments; in fact, their knowledge may (far) exceed that of their developers or users. Consequently, a desirable property for an AI system is that it is honest--that it accurately reports its …

[PDF] Markets Are Not Random, They Are Hard to Predict

MN i Alonso - arXiv preprint arXiv:2606.08209, 2026

Financial returns are often called``random,"but the word conflates ontic chance, epistemic ignorance, strategic feedback, and model instability. This essay argues that financial markets are not random in the ontic sense in which a quantum …

[HTML] Iron intake and cancer risk: an umbrella review with causal methods audit

VJ Vera-Ponce, J Ballena-Caicedo… - Precision Nutrition, 2026

Background: The potential carcinogenic role of iron—particularly heme iron—has been proposed based on its pro-oxidant and nitrosating capacity, but systematic reviews show heterogeneous results. The objective of this study is to synthesize the …

MUNet: A Multi-outcome Uplift Network for Modeling Multi-dimensional Treatment Effects

L Zhang - Pacific-Asia Conference on Knowledge Discovery and …, 2026

Uplift modeling estimates individual-level causal effects, yet most existing methods address only a single outcome, overlooking the fact that real-world interventions often influence multiple correlated outcomes. Independent modeling fails to exploit …

Bayesian network-enhanced surrogate-assisted reliability-based design optimisation for offshore wind turbine support structures

Z Qin - International Journal of Ocean Systems Management, 2026

Offshore wind turbine support structures are subject to significant environmental and structural uncertainties, requiring reliable and efficient design strategies. This study proposes an integrated framework combining Bayesian networks (BN), finite element …

Granger-Inspired Predictive Structure Test for RBG/RNG Evaluation

JH Sylvester, MA Thornton, MA Thornton, EC Larson - 2026 IEEE 19th Dallas Circuits …, 2026

New standards for post-quantum cryptography rely on new methods to evaluate the quality of random bit generators. Existing approaches largely rely on correlation-based tests, which are limited in their ability to capture dependence. In particular …

Preserving What, Removing Where: Dual-Stream Beneficial Feature Pre-Debiasing for HOI Detection

F Li, L Zhang - 2026 8th International Conference on Information …, 2026

Human-object interaction detection is a crucial task in scene understanding, aiming to localize both people and objects and infer their interactive relationships in images. However, existing visual models often rely excessively on background information …

[PDF] Explainable AI for Worker Motivation: Combining Goal-Setting Theory, SHAP Interpretability, and Reinforcement Learning in Online Labor Platforms

C Yolfe, E Page, G Fowe - Global Financial Analytics Research Review, 2026

Online labor platforms increasingly rely on algorithmic management to allocate tasks, set performance targets, and adjust incentives. While such systems optimise for platform-level efficiency, they often neglect the motivational dynamics that sustain …

[PDF] Logical Approaches to Dynamical Structures in Artificial Intelligence

KBP Thoft - 2026

This PhD thesis studies logical frameworks for interaction and learning, with applications in causal reasoning and learning games, where either the domain of interaction is graphstructured, or the outcome of learning is represented as a graph …

[PDF] Сучасні підходи до причинно-наслідкового моделювання у задачах поведінки агентів інтерактивних середовищ

ВГ Ленартович - Наука і техніка сьогодні, 2026

У статті розглянуто сучасні підходи до причинно-наслідкового моделювання у задачах поведінки агентів інтерактивних середовищ. Основну увагу приділено аналізу та порівнянню традиційних методів побудови поведінки агентів …

[PDF] Update-Relevant Support: Hume's Missing Descent

L Bruhacs

The hidden-support account of confounding gives a negative result: the same baseline public law, even augmented by the true average treatment effect, may be compatible with either zero or arbitrarily large update-relevant structural gap. This …

[PDF] Learning Counterfactual Densities via Marginal Contrastive Discrimination

A Ndiaye, K Meziani, M Olteanu

Estimating counterfactual densities provides a richer understanding of causal effects than traditional estimators based for instance on average treatment effects (ATE). However, reliable conditional density estimation remains challenging, especially in …

[HTML] Machine Learning Across Heterogeneous Biomedical Data: Representation, Integration, and Deployable Systems

AA Alecu - Bioengineering, 2026

Biomedical prediction increasingly requires machine learning methods capable of integrating heterogeneous data spanning molecular, physiological, clinical, behavioral, and environmental representations. Yet progress in this area has often …

[PDF] A Tutorial on World Models and Physical AI

IS Oh - arXiv preprint arXiv:2606.12783, 2026

World modeling is emerging as a central principle for building intelligent systems capable of prediction, reasoning, and decision making. A central distinction can be drawn between explicit world models, which learn structured dynamics for rollout …

[PDF] Can Current Agents Close the Discovery-to-Application Gap? A Case Study in Minecraft

Z Ziheng, H Tang, J Zhang, H Lin, B Yang, Q Long… - arXiv preprint arXiv …, 2026

Discovering causal regularities and applying them to build functional systems--the discovery-to-application loop--is a hallmark of general intelligence, yet evaluating this capacity has been hindered by the vast complexity gap between scientific …

[PDF] Causal inference-integrated temporal graph convolutional networks for dynamic prediction and optimization of enterprise total factor productivity

G Fu - Scientific Reports, 2026

Total factor productivity (TFP) serves as a critical indicator for measuring enterprise efficiency and technological progress. However, existing prediction methods often fail to distinguish genuine causal mechanisms from spurious correlations while …

[PDF] How Useful is Causal Invariance for Domain Adaptation in Finite-Sample Settings?

J Kostin, K Jalaldoust, E Bareinboim, S Kpotufe, F Yang - arXiv preprint arXiv …, 2026

Machine learning models often degrade when they are deployed on a target distribution that differs from the source distributions they were trained on. Recent work in causality-based domain generalization has shown how shared causal …

[HTML] Explicit specification of the prior probability of the prosecutor's hypothesis in Bayesian networks

A Sjölander, C Dahlman, G Lindkvist - Law, Probability and Risk, 2026

Bayesian networks are increasingly popular tools to model legal evidence due to their flexibility, transparency, and intuitive causal interpretation. However, an important challenge is that the prior probability of the prosecutor's hypothesis—the …

[PDF] NetCause: Counterfactual Learning for Root Cause Analysis in Large-Scale Networks

F Chraim, J Zhang, D Janzing, X Song, C Faloutsos… - arXiv preprint arXiv …, 2026

Can a learned model capture how faults propagate through a large-scale network and use this knowledge to causally attribute customer impact to its underlying root cause? Existing root cause analysis techniques often rely on static rules, correlation …

[PDF] TerraBench: Can Agents Reason Over Heterogeneous Earth-System Data?

DT Nguyen, T Nguyen, FA Maani, HM Le, MU Sheikh… - arXiv preprint arXiv …, 2026

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J Raynal, P Slangen, E Raynal, J Margerit - arXiv preprint arXiv:2606.13172, 2026

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A Gupta, D Kumar, M Mandal, S Deshpande - arXiv preprint arXiv:2606.12917, 2026

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A Hense, C Kottmeier, P Friederichs, S Buschow… - EGUsphere, 2026

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J Bae - arXiv preprint arXiv:2606.12433, 2026

Synthetic persona datasets cite alignment with official demographics as a basis for trust, yet downstream users consume them as joint structures across age, sex, region, occupation, education, name, and institutional status. Marginal alignment …

Causal Time-Series GNN with XAI for Stock Market Fraud Detection

T Le, B Nguyen, K Le, B Le - Asian Conference on Intelligent Information and …, 2026

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M Borriero, M Lupparelli, GM Marchetti, V Vinciotti - arXiv preprint arXiv:2606.13281, 2026

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E Tadlock, A Reed, M Thornton - 2026 IEEE 56th International Symposium on …, 2026

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