arXiv论文分析报告

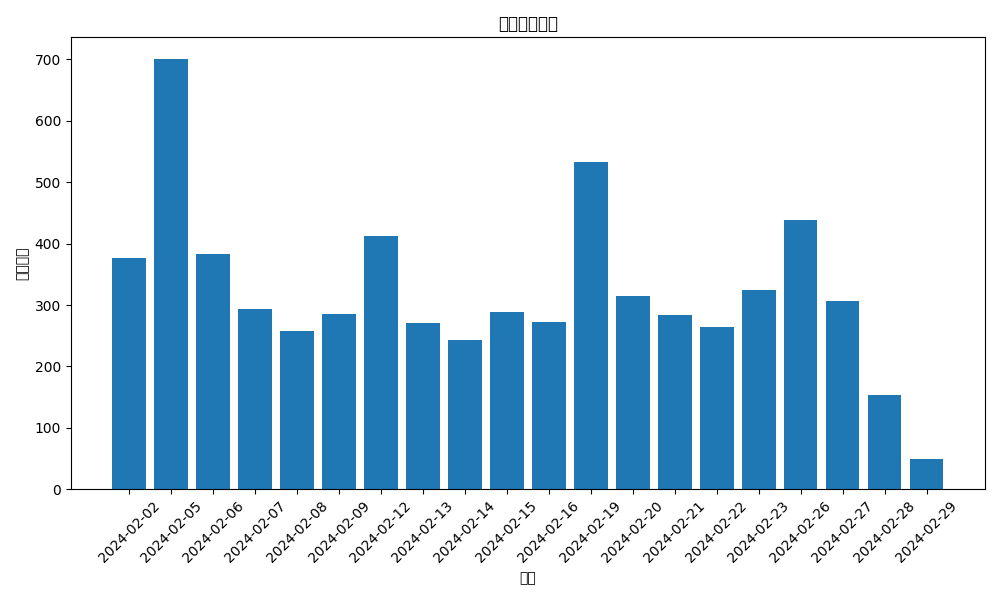
日期范围: 2024-02-01 至 2024-02-29

# 摘要

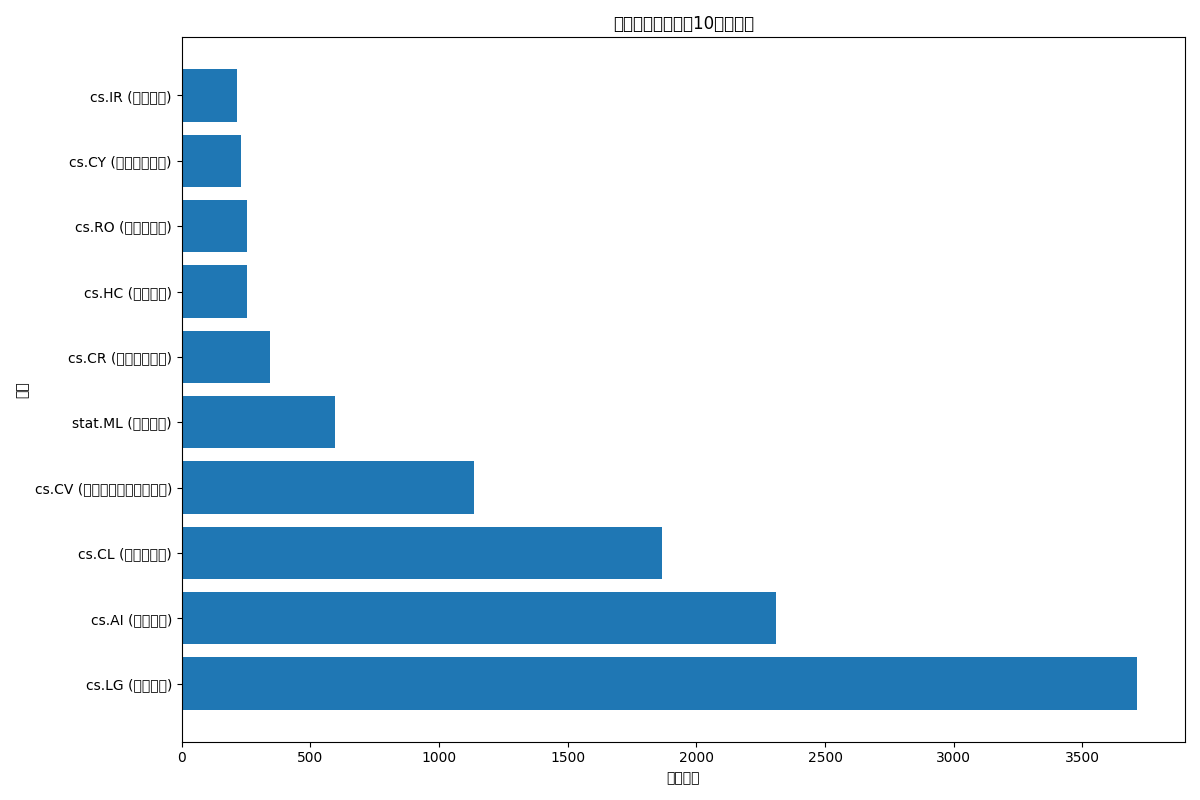
**本报告分析了arXiv上2024-02-01至2024-02-29期间发布的论文。**在此期间，共有6455篇符合条件的论文被收录。

# 数据可视化

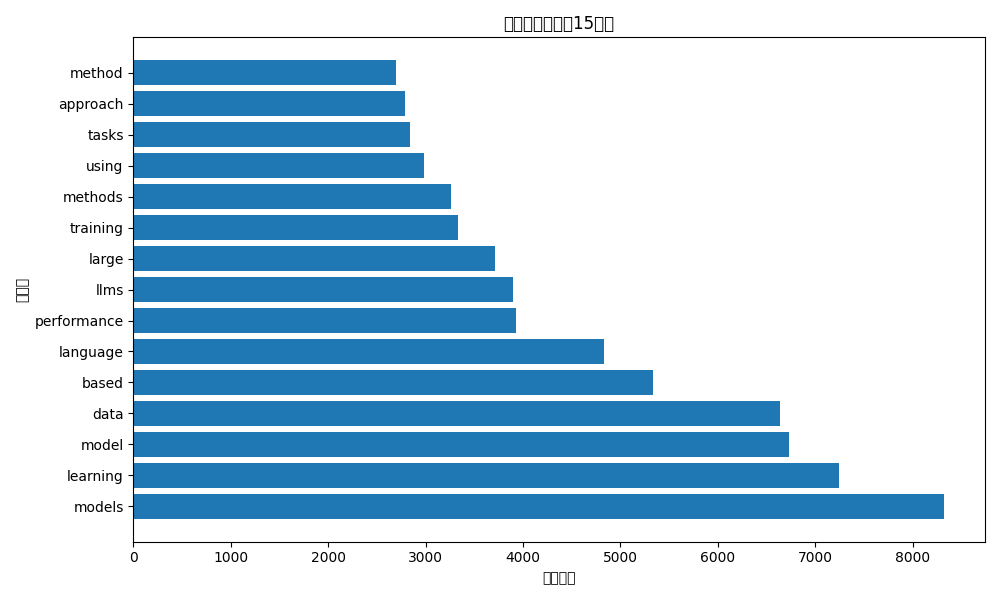
## 论文日期分布



## 论文分类分布



## 热门关键词



## 热门作者

|  |  |
| --- | --- |
| 作者 | 论文数量 |
| Yang Liu | 45 |
| Qi Zhang | 22 |
| Maosong Sun | 21 |
| Xuanjing Huang | 20 |
| Min Zhang | 19 |
| Zhiyuan Liu | 18 |
| Dacheng Tao | 16 |
| Wei Chen | 16 |
| José Alberto Benítez-Andrades | 16 |
| Jun Zhao | 15 |

# 论文阅读推荐

## 必读论文

**1. Training Large Language Models for Reasoning through Reverse Curriculum Reinforcement Learning**  
作者: Zhiheng Xi,Wenxiang Chen,Boyang Hong,Senjie Jin,Rui Zheng,Wei He,Yiwen Ding,Shichun Liu,Xin Guo,Junzhe Wang,Honglin Guo,Wei Shen,Xiaoran Fan,Yuhao Zhou,Shihan Dou,Xiao Wang,Xinbo Zhang,Peng Sun,Tao Gui,Qi Zhang,Xuanjing Huang  
分类: cs.AI, cs.CL, cs.LG  
摘要: In this paper, we propose R$^3$: Learning Reasoning through Reverse Curriculum Reinforcement Learning (RL), a novel method that employs only outcome supervision to achieve the benefits of process supe...  
URL: https://arxiv.org/abs/2402.05808

**2. OMGEval: An Open Multilingual Generative Evaluation Benchmark for Large Language Models**  
作者: Yang Liu,Meng Xu,Shuo Wang,Liner Yang,Haoyu Wang,Zhenghao Liu,Cunliang Kong,Yun Chen,Yang Liu,Maosong Sun,Erhong Yang  
分类: cs.CL  
摘要: Modern large language models (LLMs) should generally benefit individuals from various cultural backgrounds around the world. However, most recent advanced generative evaluation benchmarks tailed for L...  
URL: https://arxiv.org/abs/2402.13524

**3. Unveiling Linguistic Regions in Large Language Models**  
作者: Zhihao Zhang,Jun Zhao,Qi Zhang,Tao Gui,Xuanjing Huang  
分类: cs.CL  
摘要: Large Language Models (LLMs) have demonstrated considerable cross-lingual alignment and generalization ability. Current research primarily focuses on improving LLMs' cross-lingual generalization capab...  
URL: https://arxiv.org/abs/2402.14700

**4. OpenFedLLM: Training Large Language Models on Decentralized Private Data via Federated Learning**  
作者: Rui Ye,Wenhao Wang,Jingyi Chai,Dihan Li,Zexi Li,Yinda Xu,Yaxin Du,Yanfeng Wang,Siheng Chen  
分类: cs.LG, cs.CL, cs.DC, cs.MA  
摘要: Trained on massive publicly available data, large language models (LLMs) have demonstrated tremendous success across various fields. While more data contributes to better performance, a disconcerting ...  
URL: https://arxiv.org/abs/2402.06954

**5. ProSparse: Introducing and Enhancing Intrinsic Activation Sparsity within Large Language Models**  
作者: Chenyang Song,Xu Han,Zhengyan Zhang,Shengding Hu,Xiyu Shi,Kuai Li,Chen Chen,Zhiyuan Liu,Guangli Li,Tao Yang,Maosong Sun  
分类: cs.LG, cs.AI, cs.CL  
摘要: Activation sparsity refers to the existence of considerable weakly-contributed elements among activation outputs. As a prevalent property of the models using the ReLU activation function, activation s...  
URL: https://arxiv.org/abs/2402.13516

## 推荐阅读

**1. Solving Data-centric Tasks using Large Language Models**  
作者: Shraddha Barke,Christian Poelitz,Carina Suzana Negreanu,Benjamin Zorn,José Cambronero,Andrew D. Gordon,Vu Le,Elnaz Nouri,Nadia Polikarpova,Advait Sarkar,Brian Slininger,Neil Toronto,Jack Williams  
分类: cs.PL, cs.AI, cs.SE  
URL: https://arxiv.org/abs/2402.11734

**2. ToolSword: Unveiling Safety Issues of Large Language Models in Tool Learning Across Three Stages**  
作者: Junjie Ye,Sixian Li,Guanyu Li,Caishuang Huang,Songyang Gao,Yilong Wu,Qi Zhang,Tao Gui,Xuanjing Huang  
分类: cs.CL, cs.AI  
URL: https://arxiv.org/abs/2402.10753

**3. Deciphering the Impact of Pretraining Data on Large Language Models through Machine Unlearning**  
作者: Yang Zhao,Li Du,Xiao Ding,Kai Xiong,Zhouhao Sun,Jun Shi,Ting Liu,Bing Qin  
分类: cs.CL, cs.AI  
URL: https://arxiv.org/abs/2402.11537

**4. CodeChameleon: Personalized Encryption Framework for Jailbreaking Large Language Models**  
作者: Huijie Lv,Xiao Wang,Yuansen Zhang,Caishuang Huang,Shihan Dou,Junjie Ye,Tao Gui,Qi Zhang,Xuanjing Huang  
分类: cs.CL, cs.AI, cs.CR  
URL: https://arxiv.org/abs/2402.16717

**5. Shortened LLaMA: Depth Pruning for Large Language Models with Comparison of Retraining Methods**  
作者: Bo-Kyeong Kim,Geonmin Kim,Tae-Ho Kim,Thibault Castells,Shinkook Choi,Junho Shin,Hyoung-Kyu Song  
分类: cs.LG, cs.CL  
URL: https://arxiv.org/abs/2402.02834

... 以及其他 5 篇推荐论文

## 学习路径推荐

**路径 1: cs.CL (计算语言学)**

* **步骤 1:** OMGEval: An Open Multilingual Generative Evaluation Benchmark for Large Language Models (作者: Yang Liu,Meng Xu,Shuo Wang,Liner Yang,Haoyu Wang,Zhenghao Liu,Cunliang Kong,Yun Chen,Yang Liu,Maosong Sun,Erhong Yang)
* **步骤 2:** Unveiling Linguistic Regions in Large Language Models (作者: Zhihao Zhang,Jun Zhao,Qi Zhang,Tao Gui,Xuanjing Huang)
* **步骤 3:** ToolSword: Unveiling Safety Issues of Large Language Models in Tool Learning Across Three Stages (作者: Junjie Ye,Sixian Li,Guanyu Li,Caishuang Huang,Songyang Gao,Yilong Wu,Qi Zhang,Tao Gui,Xuanjing Huang)
* **步骤 4:** Deciphering the Impact of Pretraining Data on Large Language Models through Machine Unlearning (作者: Yang Zhao,Li Du,Xiao Ding,Kai Xiong,Zhouhao Sun,Jun Shi,Ting Liu,Bing Qin)
* **步骤 5:** CodeChameleon: Personalized Encryption Framework for Jailbreaking Large Language Models (作者: Huijie Lv,Xiao Wang,Yuansen Zhang,Caishuang Huang,Shihan Dou,Junjie Ye,Tao Gui,Qi Zhang,Xuanjing Huang)

**路径 2: cs.LG (机器学习)**

* **步骤 1:** OpenFedLLM: Training Large Language Models on Decentralized Private Data via Federated Learning (作者: Rui Ye,Wenhao Wang,Jingyi Chai,Dihan Li,Zexi Li,Yinda Xu,Yaxin Du,Yanfeng Wang,Siheng Chen)
* **步骤 2:** ProSparse: Introducing and Enhancing Intrinsic Activation Sparsity within Large Language Models (作者: Chenyang Song,Xu Han,Zhengyan Zhang,Shengding Hu,Xiyu Shi,Kuai Li,Chen Chen,Zhiyuan Liu,Guangli Li,Tao Yang,Maosong Sun)
* **步骤 3:** Shortened LLaMA: Depth Pruning for Large Language Models with Comparison of Retraining Methods (作者: Bo-Kyeong Kim,Geonmin Kim,Tae-Ho Kim,Thibault Castells,Shinkook Choi,Junho Shin,Hyoung-Kyu Song)

# 按分类的论文列表

## cs.LG (机器学习)

**1. Learning Network Representations with Disentangled Graph Auto-Encoder**  
作者: Di Fan,Chuanhou Gao  
摘要: The (variational) graph auto-encoder is widely used to learn representations for graph-structured data. However, the formation of real-world graphs is a complicated and heterogeneous process influence...  
URL: https://arxiv.org/abs/2402.01143

**2. Root Cause Analysis In Microservice Using Neural Granger Causal Discovery**  
作者: Cheng-Ming Lin,Ching Chang,Wei-Yao Wang,Kuang-Da Wang,Wen-Chih Peng  
摘要: In recent years, microservices have gained widespread adoption in IT operations due to their scalability, maintenance, and flexibility. However, it becomes challenging for site reliability engineers (...  
URL: https://arxiv.org/abs/2402.01140

**3. Double-Dip: Thwarting Label-Only Membership Inference Attacks with Transfer Learning and Randomization**  
作者: Arezoo Rajabi,Reeya Pimple,Aiswarya Janardhanan,Surudhi Asokraj,Bhaskar Ramasubramanian,Radha Poovendran  
摘要: Transfer learning (TL) has been demonstrated to improve DNN model performance when faced with a scarcity of training samples. However, the suitability of TL as a solution to reduce vulnerability of ov...  
URL: https://arxiv.org/abs/2402.01114

**4. Near-Optimal Reinforcement Learning with Self-Play under Adaptivity Constraints**  
作者: Dan Qiao,Yu-Xiang Wang  
摘要: We study the problem of multi-agent reinforcement learning (MARL) with adaptivity constraints -- a new problem motivated by real-world applications where deployments of new policies are costly and the...  
URL: https://arxiv.org/abs/2402.01111

**5. Vaccine: Perturbation-aware Alignment for Large Language Models against Harmful Fine-tuning Attack**  
作者: Tiansheng Huang,Sihao Hu,Ling Liu  
摘要: The new paradigm of finetuning-as-a-service introduces a new attack surface for Large Language Models (LLMs): a few harmful data uploaded by users can easily trick the finetuning to produce an alignme...  
URL: https://arxiv.org/abs/2402.01109

**6. Simulation of Graph Algorithms with Looped Transformers**  
作者: Artur Back de Luca,Kimon Fountoulakis  
摘要: The execution of graph algorithms using neural networks has recently attracted significant interest due to promising empirical progress. This motivates further understanding of how neural networks can...  
URL: https://arxiv.org/abs/2402.01107

**7. A Survey for Foundation Models in Autonomous Driving**  
作者: Haoxiang Gao,Zhongruo Wang,Yaqian Li,Kaiwen Long,Ming Yang,Yiqing Shen  
摘要: The advent of foundation models has revolutionized the fields of natural language processing and computer vision, paving the way for their application in autonomous driving (AD). This survey presents ...  
URL: https://arxiv.org/abs/2402.01105

**8. Compositional Generative Modeling: A Single Model is Not All You Need**  
作者: Yilun Du,Leslie Kaelbling  
摘要: Large monolithic generative models trained on massive amounts of data have become an increasingly dominant approach in AI research. In this paper, we argue that we should instead construct large gener...  
URL: https://arxiv.org/abs/2402.01103

**9. Bayesian Deep Learning for Remaining Useful Life Estimation via Stein Variational Gradient Descent**  
作者: Luca Della Libera,Jacopo Andreoli,Davide Dalle Pezze,Mirco Ravanelli,Gian Antonio Susto  
摘要: A crucial task in predictive maintenance is estimating the remaining useful life of physical systems. In the last decade, deep learning has improved considerably upon traditional model-based and stati...  
URL: https://arxiv.org/abs/2402.01098

**10. Trustworthy Distributed AI Systems: Robustness, Privacy, and Governance**  
作者: Wenqi Wei,Ling Liu  
摘要: Emerging Distributed AI systems are revolutionizing big data computing and data processing capabilities with growing economic and societal impact. However, recent studies have identified new attack su...  
URL: https://arxiv.org/abs/2402.01096

... 以及其他 1912 篇论文

## stat.ML (机器学习)

**1. Online conformal prediction with decaying step sizes**  
作者: Anastasios N. Angelopoulos,Rina Foygel Barber,Stephen Bates  
摘要: We introduce a method for online conformal prediction with decaying step sizes. Like previous methods, ours possesses a retrospective guarantee of coverage for arbitrary sequences. However, unlike pre...  
URL: https://arxiv.org/abs/2402.01139

**2. A Dynamical Model of Neural Scaling Laws**  
作者: Blake Bordelon,Alexander Atanasov,Cengiz Pehlevan  
摘要: On a variety of tasks, the performance of neural networks predictably improves with training time, dataset size and model size across many orders of magnitude. This phenomenon is known as a neural sca...  
URL: https://arxiv.org/abs/2402.01092

**3. Scalable Higher-Order Tensor Product Spline Models**  
作者: David Rügamer  
摘要: In the current era of vast data and transparent machine learning, it is essential for techniques to operate at a large scale while providing a clear mathematical comprehension of the internal workings...  
URL: https://arxiv.org/abs/2402.01090

**4. No Free Prune: Information-Theoretic Barriers to Pruning at Initialization**  
作者: Tanishq Kumar,Kevin Luo,Mark Sellke  
摘要: The existence of "lottery tickets" arXiv:1803.03635 at or near initialization raises the tantalizing question of whether large models are necessary in deep learning, or whether sparse networks can be ...  
URL: https://arxiv.org/abs/2402.01089

**5. Distributed MCMC inference for Bayesian Non-Parametric Latent Block Model**  
作者: Reda Khoufache,Anisse Belhadj,Hanene Azzag,Mustapha Lebbah  
摘要: In this paper, we introduce a novel Distributed Markov Chain Monte Carlo (MCMC) inference method for the Bayesian Non-Parametric Latent Block Model (DisNPLBM), employing the Master/Worker architecture...  
URL: https://arxiv.org/abs/2402.01050

**6. Multivariate Probabilistic Time Series Forecasting with Correlated Errors**  
作者: Vincent Zhihao Zheng,Lijun Sun  
摘要: Accurately modeling the correlation structure of errors is critical for reliable uncertainty quantification in probabilistic time series forecasting. While recent deep learning models for multivariate...  
URL: https://arxiv.org/abs/2402.01000

**7. Spectrally Transformed Kernel Regression**  
作者: Runtian Zhai,Rattana Pukdee,Roger Jin,Maria-Florina Balcan,Pradeep Ravikumar  
摘要: Unlabeled data is a key component of modern machine learning. In general, the role of unlabeled data is to impose a form of smoothness, usually from the similarity information encoded in a base kernel...  
URL: https://arxiv.org/abs/2402.00645

**8. Bayesian Causal Inference with Gaussian Process Networks**  
作者: Enrico Giudice,Jack Kuipers,Giusi Moffa  
摘要: Causal discovery and inference from observational data is an essential problem in statistics posing both modeling and computational challenges. These are typically addressed by imposing strict assumpt...  
URL: https://arxiv.org/abs/2402.00623

**9. Equivalence of the Empirical Risk Minimization to Regularization on the Family of f-Divergences**  
作者: Francisco Daunas,Iñaki Esnaola,Samir M. Perlaza,H. Vincent Poor  
摘要: The solution to empirical risk minimization with $f$-divergence regularization (ERM-$f$DR) is presented under mild conditions on $f$. Under such conditions, the optimal measure is shown to be unique. ...  
URL: https://arxiv.org/abs/2402.00501

**10. Continuous Treatment Effects with Surrogate Outcomes**  
作者: Zhenghao Zeng,David Arbour,Avi Feller,Raghavendra Addanki,Ryan Rossi,Ritwik Sinha,Edward H. Kennedy  
摘要: In many real-world causal inference applications, the primary outcomes (labels) are often partially missing, especially if they are expensive or difficult to collect. If the missingness depends on cov...  
URL: https://arxiv.org/abs/2402.00168

... 以及其他 188 篇论文

## eess.SP (信号处理)

**1. Graph Neural Networks in EEG-based Emotion Recognition: A Survey**  
作者: Chenyu Liu,Xinliang Zhou,Yihao Wu,Ruizhi Yang,Zhongruo Wang,Liming Zhai,Ziyu Jia,Yang Liu  
摘要: Compared to other modalities, EEG-based emotion recognition can intuitively respond to the emotional patterns in the human brain and, therefore, has become one of the most concerning tasks in the brai...  
URL: https://arxiv.org/abs/2402.01138

**2. Simultaneous Calibration and Navigation (SCAN) of Multiple Ultrasonic Local Positioning Systems**  
作者: David Gualda,Jesus Urena,Juan C. Garcia,Enrique Garcia,Jose Alcala  
摘要: This paper proposes a Simultaneous Calibration and Navigation (SCAN) algorithm of a multiple Ultrasonic Local Positioning Systems (ULPSs) that cover an extensive indoor area. The idea is the developme...  
URL: https://arxiv.org/abs/2402.02241

**3. A Scoping Review of Energy Load Disaggregation**  
作者: Balázs András Tolnai,Zheng Ma,Bo Nørregaard Jørgensen  
摘要: Energy load disaggregation can contribute to balancing power grids by enhancing the effectiveness of demand-side management and promoting electricity-saving behavior through increased consumer awarene...  
URL: https://arxiv.org/abs/2402.01654

**4. Multilinear Kernel Regression and Imputation via Manifold Learning**  
作者: Duc Thien Nguyen,Konstantinos Slavakis  
摘要: This paper introduces a novel nonparametric framework for data imputation, coined multilinear kernel regression and imputation via the manifold assumption (MultiL-KRIM). Motivated by manifold learning...  
URL: https://arxiv.org/abs/2402.03648

**5. Weakly supervised covariance matrices alignment through Stiefel matrices estimation for MEG applications**  
作者: Antoine Collas,Rémi Flamary,Alexandre Gramfort  
摘要: This paper introduces a novel domain adaptation technique for time series data, called Mixing model Stiefel Adaptation (MSA), specifically addressing the challenge of limited labeled signals in the ta...  
URL: https://arxiv.org/abs/2402.03345

**6. SDEMG: Score-based Diffusion Model for Surface Electromyographic Signal Denoising**  
作者: Yu-Tung Liu,Kuan-Chen Wang,Kai-Chun Liu,Sheng-Yu Peng,Yu Tsao  
摘要: Surface electromyography (sEMG) recordings can be influenced by electrocardiogram (ECG) signals when the muscle being monitored is close to the heart. Several existing methods use signal-processing-ba...  
URL: https://arxiv.org/abs/2402.03808

**7. Graph Neural Networks for Physical-Layer Security in Multi-User Flexible-Duplex Networks**  
作者: Tharaka Perera,Saman Atapattu,Yuting Fang,Jamie Evans  
摘要: This paper explores Physical-Layer Security (PLS) in Flexible Duplex (FlexD) networks, considering scenarios involving eavesdroppers. Our investigation revolves around the intricacies of the sum secre...  
URL: https://arxiv.org/abs/2402.05378

**8. A Non-Intrusive Neural Quality Assessment Model for Surface Electromyography Signals**  
作者: Cho-Yuan Lee,Kuan-Chen Wang,Kai-Chun Liu,Yu-Te Wang,Xugang Lu,Ping-Cheng Yeh,Yu Tsao  
摘要: In practical scenarios involving the measurement of surface electromyography (sEMG) in muscles, particularly those areas near the heart, one of the primary sources of contamination is the presence of ...  
URL: https://arxiv.org/abs/2402.05482

**9. Compressive Recovery of Signals Defined on Perturbed Graphs**  
作者: Sabyasachi Ghosh,Ajit Rajwade  
摘要: Recovery of signals with elements defined on the nodes of a graph, from compressive measurements is an important problem, which can arise in various domains such as sensor networks, image reconstructi...  
URL: https://arxiv.org/abs/2402.07637

**10. You can monitor your hydration level using your smartphone camera**  
作者: Rose Alaslani,Levina Perzhilla,Muhammad Mahboob Ur Rahman,Taous-Meriem Laleg-Kirati,Tareq Y. Al-Naffouri  
摘要: This work proposes for the first time to utilize the regular smartphone -- a popular assistive gadget -- to design a novel, non-invasive method for self-monitoring of one's hydration level on a scale ...  
URL: https://arxiv.org/abs/2402.07467

... 以及其他 44 篇论文

## cs.IR (信息检索)

**1. A Multi-Agent Conversational Recommender System**  
作者: Jiabao Fang,Shen Gao,Pengjie Ren,Xiuying Chen,Suzan Verberne,Zhaochun Ren  
摘要: Due to strong capabilities in conducting fluent, multi-turn conversations with users, Large Language Models (LLMs) have the potential to further improve the performance of Conversational Recommender S...  
URL: https://arxiv.org/abs/2402.01135

**2. TransFR: Transferable Federated Recommendation with Pre-trained Language Models**  
作者: Honglei Zhang,He Liu,Haoxuan Li,Yidong Li  
摘要: Federated recommendations (FRs), facilitating multiple local clients to collectively learn a global model without disclosing user private data, have emerged as a prevalent architecture for privacy-pre...  
URL: https://arxiv.org/abs/2402.01124

**3. DNS-Rec: Data-aware Neural Architecture Search for Recommender Systems**  
作者: Sheng Zhang,Maolin Wang,Yao Zhao,Chenyi Zhuang,Jinjie Gu,Ruocheng Guo,Xiangyu Zhao,Zijian Zhang,Hongzhi Yin  
摘要: In the era of data proliferation, efficiently sifting through vast information to extract meaningful insights has become increasingly crucial. This paper addresses the computational overhead and resou...  
URL: https://arxiv.org/abs/2402.00390

**4. An Exam-based Evaluation Approach Beyond Traditional Relevance Judgments**  
作者: Naghmeh Farzi,Laura Dietz  
摘要: Current IR evaluation is based on relevance judgments, created either manually or automatically, with decisions outsourced to Large Language Models (LLMs). We offer an alternative paradigm, that never...  
URL: https://arxiv.org/abs/2402.00309

**5. PAP-REC: Personalized Automatic Prompt for Recommendation Language Model**  
作者: Zelong Li,Jianchao Ji,Yingqiang Ge,Wenyue Hua,Yongfeng Zhang  
摘要: Recently emerged prompt-based Recommendation Language Models (RLM) can solve multiple recommendation tasks uniformly. The RLMs make full use of the inherited knowledge learned from the abundant pre-tr...  
URL: https://arxiv.org/abs/2402.00284

**6. Position bias in features**  
作者: Richard Demsyn-Jones  
摘要: The purpose of modeling document relevance for search engines is to rank better in subsequent searches. Document-specific historical click-through rates can be important features in a dynamic ranking ...  
URL: https://arxiv.org/abs/2402.02626

**7. eXplainable Bayesian Multi-Perspective Generative Retrieval**  
作者: EuiYul Song,Philhoon Oh,Sangryul Kim,James Thorne  
摘要: Modern deterministic retrieval pipelines prioritize achieving state-of-the-art performance but often lack interpretability in decision-making. These models face challenges in assessing uncertainty, le...  
URL: https://arxiv.org/abs/2402.02418

**8. Diffusion Cross-domain Recommendation**  
作者: Yuner Xuan  
摘要: It is always a challenge for recommender systems to give high-quality outcomes to cold-start users. One potential solution to alleviate the data sparsity problem for cold-start users in the target dom...  
URL: https://arxiv.org/abs/2402.02182

**9. Position Paper: Why the Shooting in the Dark Method Dominates Recommender Systems Practice; A Call to Abandon Anti-Utopian Thinking**  
作者: David Rohde  
摘要: Applied recommender systems research is in a curious position. While there is a very rigorous protocol for measuring performance by A/B testing, best practice for finding a `B' to test does not explic...  
URL: https://arxiv.org/abs/2402.02152

**10. Clarifying the Path to User Satisfaction: An Investigation into Clarification Usefulness**  
作者: Hossein A. Rahmani,Xi Wang,Mohammad Aliannejadi,Mohammadmehdi Naghiaei,Emine Yilmaz  
摘要: Clarifying questions are an integral component of modern information retrieval systems, directly impacting user satisfaction and overall system performance. Poorly formulated questions can lead to use...  
URL: https://arxiv.org/abs/2402.01934

... 以及其他 106 篇论文

## cs.CV (计算机视觉和模式识别)

**1. DeepAAT: Deep Automated Aerial Triangulation for Fast UAV-based Mapping**  
作者: Zequan Chen,Jianping Li,Qusheng Li,Bisheng Yang,Zhen Dong  
摘要: Automated Aerial Triangulation (AAT), aiming to restore image pose and reconstruct sparse points simultaneously, plays a pivotal role in earth observation. With its rich research heritage spanning sev...  
URL: https://arxiv.org/abs/2402.01134

**2. A Single Simple Patch is All You Need for AI-generated Image Detection**  
作者: Jiaxuan Chen,Jieteng Yao,Li Niu  
摘要: The recent development of generative models unleashes the potential of generating hyper-realistic fake images. To prevent the malicious usage of fake images, AI-generated image detection aims to disti...  
URL: https://arxiv.org/abs/2402.01123

**3. IMUGPT 2.0: Language-Based Cross Modality Transfer for Sensor-Based Human Activity Recognition**  
作者: Zikang Leng,Amitrajit Bhattacharjee,Hrudhai Rajasekhar,Lizhe Zhang,Elizabeth Bruda,Hyeokhyen Kwon,Thomas Plötz  
摘要: One of the primary challenges in the field of human activity recognition (HAR) is the lack of large labeled datasets. This hinders the development of robust and generalizable models. Recently, cross m...  
URL: https://arxiv.org/abs/2402.01049

**4. AI-generated faces influence gender stereotypes and racial homogenization**  
作者: Nouar AlDahoul,Talal Rahwan,Yasir Zaki  
摘要: Text-to-image generative AI models such as Stable Diffusion are used daily by millions worldwide. However, the extent to which these models exhibit racial and gender stereotypes is not yet fully under...  
URL: https://arxiv.org/abs/2402.01002

**5. mmID: High-Resolution mmWave Imaging for Human Identification**  
作者: Sakila S. Jayaweera,Sai Deepika Regani,Yuqian Hu,Beibei Wang,K. J. Ray Liu  
摘要: Achieving accurate human identification through RF imaging has been a persistent challenge, primarily attributed to the limited aperture size and its consequent impact on imaging resolution. The exist...  
URL: https://arxiv.org/abs/2402.00996

**6. A Cost-Efficient Approach for Creating Virtual Fitting Room using Generative Adversarial Networks (GANs)**  
作者: Kirolos Attallah,Girgis Zaky,Nourhan Abdelrhim,Kyrillos Botros,Amjad Dife,Nermin Negied  
摘要: Customers all over the world want to see how the clothes fit them or not before purchasing. Therefore, customers by nature prefer brick-and-mortar clothes shopping so they can try on products before p...  
URL: https://arxiv.org/abs/2402.00994

**7. YOLinO++: Single-Shot Estimation of Generic Polylines for Mapless Automated Diving**  
作者: Annika Meyer,Christoph Stiller  
摘要: In automated driving, highly accurate maps are commonly used to support and complement perception. These maps are costly to create and quickly become outdated as the traffic world is permanently chang...  
URL: https://arxiv.org/abs/2402.00989

**8. Enhanced fringe-to-phase framework using deep learning**  
作者: Won-Hoe Kim,Bongjoong Kim,Hyung-Gun Chi,Jae-Sang Hyun  
摘要: In Fringe Projection Profilometry (FPP), achieving robust and accurate 3D reconstruction with a limited number of fringe patterns remains a challenge in structured light 3D imaging. Conventional metho...  
URL: https://arxiv.org/abs/2402.00977

**9. FuseFormer: A Transformer for Visual and Thermal Image Fusion**  
作者: Aytekin Erdogan,Erdem Akagündüz  
摘要: Due to the lack of a definitive ground truth for the image fusion problem, the loss functions are structured based on evaluation metrics, such as the structural similarity index measure (SSIM). Howeve...  
URL: https://arxiv.org/abs/2402.00971

**10. MUSTAN: Multi-scale Temporal Context as Attention for Robust Video Foreground Segmentation**  
作者: Praveen Kumar Pokala,Jaya Sai Kiran Patibandla,Naveen Kumar Pandey,Balakrishna Reddy Pailla  
摘要: Video foreground segmentation (VFS) is an important computer vision task wherein one aims to segment the objects under motion from the background. Most of the current methods are image-based, i.e., re...  
URL: https://arxiv.org/abs/2402.00918

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## cs.AI (人工智能)

**1. PokeLLMon: A Human-Parity Agent for Pokemon Battles with Large Language Models**  
作者: Sihao Hu,Tiansheng Huang,Ling Liu  
摘要: We introduce PokeLLMon, the first LLM-embodied agent that achieves human-parity performance in tactical battle games, as demonstrated in Pokemon battles. The design of PokeLLMon incorporates three key...  
URL: https://arxiv.org/abs/2402.01118

**2. Real Sparks of Artificial Intelligence and the Importance of Inner Interpretability**  
作者: Alex Grzankowski  
摘要: The present paper looks at one of the most thorough articles on the intelligence of GPT, research conducted by engineers at Microsoft. Although there is a great deal of value in their work, I will arg...  
URL: https://arxiv.org/abs/2402.00901

**3. FM3Q: Factorized Multi-Agent MiniMax Q-Learning for Two-Team Zero-Sum Markov Game**  
作者: Guangzheng Hu,Yuanheng Zhu,Haoran Li,Dongbin Zhao  
摘要: Many real-world applications involve some agents that fall into two teams, with payoffs that are equal within the same team but of opposite sign across the opponent team. The so-called two-team zero-s...  
URL: https://arxiv.org/abs/2402.00738

**4. Intent Assurance using LLMs guided by Intent Drift**  
作者: Kristina Dzeparoska,Ali Tizghadam,Alberto Leon-Garcia  
摘要: Intent-Based Networking (IBN) presents a paradigm shift for network management, by promising to align intents and business objectives with network operations--in an automated manner. However, its prac...  
URL: https://arxiv.org/abs/2402.00715

**5. Learning Planning-based Reasoning by Trajectories Collection and Process Reward Synthesizing**  
作者: Fangkai Jiao,Chengwei Qin,Zhengyuan Liu,Nancy F. Chen,Shafiq Joty  
摘要: Large Language Models (LLMs) have demonstrated significant potential in handling complex reasoning tasks through step-by-step rationale generation. However, recent studies have raised concerns regardi...  
URL: https://arxiv.org/abs/2402.00658

**6. Sandra -- A Neuro-Symbolic Reasoner Based On Descriptions And Situations**  
作者: Nicolas Lazzari,Stefano De Giorgis,Aldo Gangemi,Valentina Presutti  
摘要: This paper presents sandra, a neuro-symbolic reasoner combining vectorial representations with deductive reasoning. Sandra builds a vector space constrained by an ontology and performs reasoning over ...  
URL: https://arxiv.org/abs/2402.00591

**7. EXMOS: Explanatory Model Steering Through Multifaceted Explanations and Data Configurations**  
作者: Aditya Bhattacharya,Simone Stumpf,Lucija Gosak,Gregor Stiglic,Katrien Verbert  
摘要: Explanations in interactive machine-learning systems facilitate debugging and improving prediction models. However, the effectiveness of various global model-centric and data-centric explanations in a...  
URL: https://arxiv.org/abs/2402.00491

**8. A Personalized Framework for Consumer and Producer Group Fairness Optimization in Recommender Systems**  
作者: Hossein A. Rahmani,Mohammadmehdi Naghiaei,Yashar Deldjoo  
摘要: In recent years, there has been an increasing recognition that when machine learning (ML) algorithms are used to automate decisions, they may mistreat individuals or groups, with legal, ethical, or ec...  
URL: https://arxiv.org/abs/2402.00485

**9. RadDQN: a Deep Q Learning-based Architecture for Finding Time-efficient Minimum Radiation Exposure Pathway**  
作者: Biswajit Sadhu,Trijit Sadhu,S. Anand  
摘要: Recent advancements in deep reinforcement learning (DRL) techniques have sparked its multifaceted applications in the automation sector. Managing complex decision-making problems with DRL encourages i...  
URL: https://arxiv.org/abs/2402.00468

**10. Computational Experiments Meet Large Language Model Based Agents: A Survey and Perspective**  
作者: Qun Ma,Xiao Xue,Deyu Zhou,Xiangning Yu,Donghua Liu,Xuwen Zhang,Zihan Zhao,Yifan Shen,Peilin Ji,Juanjuan Li,Gang Wang,Wanpeng Ma  
摘要: Computational experiments have emerged as a valuable method for studying complex systems, involving the algorithmization of counterfactuals. However, accurately representing real social systems in Age...  
URL: https://arxiv.org/abs/2402.00262

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## cs.CL (计算语言学)

**1. DTS-SQL: Decomposed Text-to-SQL with Small Large Language Models**  
作者: Mohammadreza Pourreza,Davood Rafiei  
摘要: Leading models for the text-to-SQL task heavily rely on proprietary Large Language Models (LLMs), posing concerns over data privacy. Closing the performance gap between small open-source models and la...  
URL: https://arxiv.org/abs/2402.01117

**2. Interpretation of Intracardiac Electrograms Through Textual Representations**  
作者: William Jongwon Han,Diana Gomez,Avi Alok,Chaojing Duan,Michael A. Rosenberg,Douglas Weber,Emerson Liu,Ding Zhao  
摘要: Understanding the irregular electrical activity of atrial fibrillation (AFib) has been a key challenge in electrocardiography. For serious cases of AFib, catheter ablations are performed to collect in...  
URL: https://arxiv.org/abs/2402.01115

**3. Reasoning Capacity in Multi-Agent Systems: Limitations, Challenges and Human-Centered Solutions**  
作者: Pouya Pezeshkpour,Eser Kandogan,Nikita Bhutani,Sajjadur Rahman,Tom Mitchell,Estevam Hruschka  
摘要: Remarkable performance of large language models (LLMs) in a variety of tasks brings forth many opportunities as well as challenges of utilizing them in production settings. Towards practical adoption ...  
URL: https://arxiv.org/abs/2402.01108

**4. Reading Between the Tweets: Deciphering Ideological Stances of Interconnected Mixed-Ideology Communities**  
作者: Zihao He,Ashwin Rao,Siyi Guo,Negar Mokhberian,Kristina Lerman  
摘要: Recent advances in NLP have improved our ability to understand the nuanced worldviews of online communities. Existing research focused on probing ideological stances treats liberals and conservatives ...  
URL: https://arxiv.org/abs/2402.01091

**5. Evaluation Methodology for Large Language Models for Multilingual Document Question and Answer**  
作者: Adar Kahana,Jaya Susan Mathew,Said Bleik,Jeremy Reynolds,Oren Elisha  
摘要: With the widespread adoption of Large Language Models (LLMs), in this paper we investigate the multilingual capability of these models. Our preliminary results show that, translating the native langua...  
URL: https://arxiv.org/abs/2402.01065

**6. Plan-Grounded Large Language Models for Dual Goal Conversational Settings**  
作者: Diogo Glória-Silva,Rafael Ferreira,Diogo Tavares,David Semedo,João Magalhães  
摘要: Training Large Language Models (LLMs) to follow user instructions has been shown to supply the LLM with ample capacity to converse fluently while being aligned with humans. Yet, it is not completely c...  
URL: https://arxiv.org/abs/2402.01053

**7. Generation, Distillation and Evaluation of Motivational Interviewing-Style Reflections with a Foundational Language Model**  
作者: Andrew Brown,Jiading Zhu,Mohamed Abdelwahab,Alec Dong,Cindy Wang,Jonathan Rose  
摘要: Large Foundational Language Models are capable of performing many tasks at a high level but are difficult to deploy in many applications because of their size and proprietary ownership. Many will be m...  
URL: https://arxiv.org/abs/2402.01051

**8. Getting the most out of your tokenizer for pre-training and domain adaptation**  
作者: Gautier Dagan,Gabriel Synnaeve,Baptiste Rozière  
摘要: Tokenization is an understudied and often neglected component of modern LLMs. Most published works use a single tokenizer for all experiments, often borrowed from another model, without performing abl...  
URL: https://arxiv.org/abs/2402.01035

**9. Executable Code Actions Elicit Better LLM Agents**  
作者: Xingyao Wang,Yangyi Chen,Lifan Yuan,Yizhe Zhang,Yunzhu Li,Hao Peng,Heng Ji  
摘要: Large Language Model (LLM) agents, capable of performing a broad range of actions, such as invoking tools and controlling robots, show great potential in tackling real-world challenges. LLM agents are...  
URL: https://arxiv.org/abs/2402.01030

**10. Domain-Independent Deception: A New Taxonomy and Linguistic Analysis**  
作者: Rakesh M. Verma,Nachum Dershowitz,Victor Zeng,Dainis Boumber,Xuting Liu  
摘要: Internet-based economies and societies are drowning in deceptive attacks. These attacks take many forms, such as fake news, phishing, and job scams, which we call ``domains of deception.'' Machine-lea...  
URL: https://arxiv.org/abs/2402.01019

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## cs.RO (机器人技术)

**1. Scalable Multi-modal Model Predictive Control via Duality-based Interaction Predictions**  
作者: Hansung Kim,Siddharth H. Nair,Francesco Borrelli  
摘要: We propose a hierarchical architecture designed for scalable real-time Model Predictive Control (MPC) in complex, multi-modal traffic scenarios. This architecture comprises two key components: 1) RAID...  
URL: https://arxiv.org/abs/2402.01116

**2. Learning Which Side to Scan: Multi-View Informed Active Perception with Side Scan Sonar for Autonomous Underwater Vehicles**  
作者: Advaith V. Sethuraman,Philip Baldoni,Katherine A. Skinner,James McMahon  
摘要: Autonomous underwater vehicles often perform surveys that capture multiple views of targets in order to provide more information for human operators or automatic target recognition algorithms. In this...  
URL: https://arxiv.org/abs/2402.01106

**3. Sim-to-Real of Soft Robots with Learned Residual Physics**  
作者: Junpeng Gao,Mike Yan Michelis,Andrew Spielberg,Robert K. Katzschmann  
摘要: Accurately modeling soft robots in simulation is computationally expensive and commonly falls short of representing the real world. This well-known discrepancy, known as the sim-to-real gap, can have ...  
URL: https://arxiv.org/abs/2402.01086

**4. Bio-Inspired Compensatory Strategies for Damage to Flapping Robotic Propulsors**  
作者: Meredith L. Hooper,Isabel Scherl,Morteza Gharib  
摘要: To maintain full autonomy, autonomous robotic systems must have the ability to self-repair. Self-repairing via compensatory mechanisms appears in nature: for example, some fish can lose even 76% of th...  
URL: https://arxiv.org/abs/2402.01062

**5. Neural Style Transfer with Twin-Delayed DDPG for Shared Control of Robotic Manipulators**  
作者: Raul Fernandez-Fernandez,Marco Aggravi,Paolo Robuffo Giordano,Juan G. Victores,Claudio Pacchierotti  
摘要: Neural Style Transfer (NST) refers to a class of algorithms able to manipulate an element, most often images, to adopt the appearance or style of another one. Each element is defined as a combination ...  
URL: https://arxiv.org/abs/2402.00722

**6. WayFASTER: a Self-Supervised Traversability Prediction for Increased Navigation Awareness**  
作者: Mateus Valverde Gasparino,Arun Narenthiran Sivakumar,Girish Chowdhary  
摘要: Accurate and robust navigation in unstructured environments requires fusing data from multiple sensors. Such fusion ensures that the robot is better aware of its surroundings, including areas of the e...  
URL: https://arxiv.org/abs/2402.00683

**7. Real Evaluations Tractability using Continuous Goal-Directed Actions in Smart City Applications**  
作者: Raul Fernandez-Fernandez,Juan G. Victores,David Estevez,Carlos Balaguer  
摘要: One of the most important challenges of Smart City Applications is to adapt the system to interact with non-expert users. Robot imitation frameworks aim to simplify and reduce times of robot programmi...  
URL: https://arxiv.org/abs/2402.00678

**8. Neural Policy Style Transfer**  
作者: Raul Fernandez-Fernandez,Juan G. Victores,Jennifer J. Gago,David Estevez,Carlos Balaguer  
摘要: Style Transfer has been proposed in a number of fields: fine arts, natural language processing, and fixed trajectories. We scale this concept up to control policies within a Deep Reinforcement Learnin...  
URL: https://arxiv.org/abs/2402.00677

**9. Deep Robot Sketching: An application of Deep Q-Learning Networks for human-like sketching**  
作者: Raul Fernandez-Fernandez,Juan G. Victores,Carlos Balaguer  
摘要: The current success of Reinforcement Learning algorithms for its performance in complex environments has inspired many recent theoretical approaches to cognitive science. Artistic environments are stu...  
URL: https://arxiv.org/abs/2402.00676

**10. Transferring human emotions to robot motions using Neural Policy Style Transfer**  
作者: Raul Fernandez-Fernandez,Bartek Łukawski,Juan G. Victores,Claudio Pacchierotti  
摘要: Neural Style Transfer (NST) was originally proposed to use feature extraction capabilities of Neural Networks as a way to perform Style Transfer with images. Pre-trained image classification architect...  
URL: https://arxiv.org/abs/2402.00663

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## cs.CR (密码学和安全)

**1. Salsa Fresca: Angular Embeddings and Pre-Training for ML Attacks on Learning With Errors**  
作者: Samuel Stevens,Emily Wenger,Cathy Li,Niklas Nolte,Eshika Saxena,François Charton,Kristin Lauter  
摘要: Learning with Errors (LWE) is a hard math problem underlying recently standardized post-quantum cryptography (PQC) systems for key exchange and digital signatures. Prior work proposed new machine lear...  
URL: https://arxiv.org/abs/2402.01082

**2. algoXSSF: Detection and analysis of cross-site request forgery (XSRF) and cross-site scripting (XSS) attacks via Machine learning algorithms**  
作者: Naresh Kshetri,Dilip Kumar,James Hutson,Navneet Kaur,Omar Faruq Osama  
摘要: The global rise of online users and online devices has ultimately given rise to the global internet population apart from several cybercrimes and cyberattacks. The combination of emerging new technolo...  
URL: https://arxiv.org/abs/2402.01012

**3. A Review on Blockchain Technologies for an Advanced and Cyber-Resilient Automotive Industry**  
作者: Paula Fraga-Lamas,Tiago M. Fernandez-Carames  
摘要: In the last century the automotive industry has arguably transformed society, being one of the most complex, sophisticated and technologically advanced industries, with innovations ranging from hybrid...  
URL: https://arxiv.org/abs/2402.00954

**4. Deep Learning Approaches for Network Traffic Classification in the Internet of Things (IoT): A Survey**  
作者: Jawad Hussain Kalwar,Sania Bhatti  
摘要: The Internet of Things (IoT) has witnessed unprecedented growth, resulting in a massive influx of diverse network traffic from interconnected devices. Effectively classifying this network traffic is c...  
URL: https://arxiv.org/abs/2402.00920

**5. Institutional Platform for Secure Self-Service Large Language Model Exploration**  
作者: V. K. Cody Bumgardner,Mitchell A. Klusty,W. Vaiden Logan,Samuel E. Armstrong,Caroline N. Leach,Kenneth L. Calvert,Caylin Hickey,Jeff Talbert  
摘要: This paper introduces a user-friendly platform developed by the University of Kentucky Center for Applied AI, designed to make large, customized language models (LLMs) more accessible. By capitalizing...  
URL: https://arxiv.org/abs/2402.00913

**6. BrainLeaks: On the Privacy-Preserving Properties of Neuromorphic Architectures against Model Inversion Attacks**  
作者: Hamed Poursiami,Ihsen Alouani,Maryam Parsa  
摘要: With the mainstream integration of machine learning into security-sensitive domains such as healthcare and finance, concerns about data privacy have intensified. Conventional artificial neural network...  
URL: https://arxiv.org/abs/2402.00906

**7. An Early Categorization of Prompt Injection Attacks on Large Language Models**  
作者: Sippo Rossi,Alisia Marianne Michel,Raghava Rao Mukkamala,Jason Bennett Thatcher  
摘要: Large language models and AI chatbots have been at the forefront of democratizing artificial intelligence. However, the releases of ChatGPT and other similar tools have been followed by growing concer...  
URL: https://arxiv.org/abs/2402.00898

**8. Privacy and Security Implications of Cloud-Based AI Services : A Survey**  
作者: Alka Luqman,Riya Mahesh,Anupam Chattopadhyay  
摘要: This paper details the privacy and security landscape in today's cloud ecosystem and identifies that there is a gap in addressing the risks introduced by machine learning models. As machine learning a...  
URL: https://arxiv.org/abs/2402.00896

**9. Large Language Models in Cybersecurity: State-of-the-Art**  
作者: Farzad Nourmohammadzadeh Motlagh,Mehrdad Hajizadeh,Mehryar Majd,Pejman Najafi,Feng Cheng,Christoph Meinel  
摘要: The rise of Large Language Models (LLMs) has revolutionized our comprehension of intelligence bringing us closer to Artificial Intelligence. Since their introduction, researchers have actively explore...  
URL: https://arxiv.org/abs/2402.00891

**10. Utilizing Large Language Models to Translate RFC Protocol Specifications to CPSA Definitions**  
作者: Martin Duclos,Ivan A. Fernandez,Kaneesha Moore,Sudip Mittal,Edward Zieglar  
摘要: This paper proposes the use of Large Language Models (LLMs) for translating Request for Comments (RFC) protocol specifications into a format compatible with the Cryptographic Protocol Shapes Analyzer ...  
URL: https://arxiv.org/abs/2402.00890

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## eess.IV (图像和视频处理)

**1. Assessing Patient Eligibility for Inspire Therapy through Machine Learning and Deep Learning Models**  
作者: Mohsena Chowdhury,Tejas Vyas,Rahul Alapati,Andrés M Bur,Guanghui Wang  
摘要: Inspire therapy is an FDA-approved internal neurostimulation treatment for obstructive sleep apnea. However, not all patients respond to this therapy, posing a challenge even for experienced otolaryng...  
URL: https://arxiv.org/abs/2402.01067

**2. Unconditional Latent Diffusion Models Memorize Patient Imaging Data: Implications for Openly Sharing Synthetic Data**  
作者: Salman Ul Hassan Dar,Marvin Seyfarth,Isabelle Ayx,Theano Papavassiliu,Stefan O. Schoenberg,Robert Malte Siepmann,Fabian Christopher Laqua,Jannik Kahmann,Norbert Frey,Bettina Baeßler,Sebastian Foersch,Daniel Truhn,Jakob Nikolas Kather,Sandy Engelhardt  
摘要: AI models present a wide range of applications in the field of medicine. However, achieving optimal performance requires access to extensive healthcare data, which is often not readily available. Furt...  
URL: https://arxiv.org/abs/2402.01054

**3. VIS-MAE: An Efficient Self-supervised Learning Approach on Medical Image Segmentation and Classification**  
作者: Zelong Liu,Andrew Tieu,Nikhil Patel,Georgios Soultanidis,Louisa Deyer,Ying Wang,Sean Huver,Alexander Zhou,Yunhao Mei,Zahi A. Fayad,Timothy Deyer,Xueyan Mei  
摘要: Artificial Intelligence (AI) has the potential to revolutionize diagnosis and segmentation in medical imaging. However, development and clinical implementation face multiple challenges including limit...  
URL: https://arxiv.org/abs/2402.01034

**4. Coronary Artery Disease Classification with Different Lesion Degree Ranges based on Deep Learning**  
作者: Ariadna Jiménez-Partinen,Karl Thurnhofer-Hemsi,Esteban J. Palomo,Jorge Rodríguez-Capitán,Ana I. Molina-Ramos  
摘要: Invasive Coronary Angiography (ICA) images are considered the gold standard for assessing the state of the coronary arteries. Deep learning classification methods are widely used and well-developed in...  
URL: https://arxiv.org/abs/2402.00593

**5. CADICA: a new dataset for coronary artery disease detection by using invasive coronary angiography**  
作者: Ariadna Jiménez-Partinen,Miguel A. Molina-Cabello,Karl Thurnhofer-Hemsi,Esteban J. Palomo,Jorge Rodríguez-Capitán,Ana I. Molina-Ramos,Manuel Jiménez-Navarro  
摘要: Coronary artery disease (CAD) remains the leading cause of death globally and invasive coronary angiography (ICA) is considered the gold standard of anatomical imaging evaluation when CAD is suspected...  
URL: https://arxiv.org/abs/2402.00570

**6. Image2Points:A 3D Point-based Context Clusters GAN for High-Quality PET Image Reconstruction**  
作者: Jiaqi Cui,Yan Wang,Lu Wen,Pinxian Zeng,Xi Wu,Jiliu Zhou,Dinggang Shen  
摘要: To obtain high-quality Positron emission tomography (PET) images while minimizing radiation exposure, numerous methods have been proposed to reconstruct standard-dose PET (SPET) images from the corres...  
URL: https://arxiv.org/abs/2402.00376

**7. Disentangled Multimodal Brain MR Image Translation via Transformer-based Modality Infuser**  
作者: Jihoon Cho,Xiaofeng Liu,Fangxu Xing,Jinsong Ouyang,Georges El Fakhri,Jinah Park,Jonghye Woo  
摘要: Multimodal Magnetic Resonance (MR) Imaging plays a crucial role in disease diagnosis due to its ability to provide complementary information by analyzing a relationship between multimodal images on th...  
URL: https://arxiv.org/abs/2402.00375

**8. Detecting Brain Tumors through Multimodal Neural Networks**  
作者: Antonio Curci,Andrea Esposito  
摘要: Tumors can manifest in various forms and in different areas of the human body. Brain tumors are specifically hard to diagnose and treat because of the complexity of the organ in which they develop. De...  
URL: https://arxiv.org/abs/2402.00038

**9. Diffusion MRI with Machine Learning**  
作者: Davood Karimi,Simon K. Warfield  
摘要: \hspace{2mm} Diffusion-weighted magnetic resonance imaging (dMRI) of the brain offers unique capabilities including noninvasive probing of tissue microstructure and structural connectivity. It is wide...  
URL: https://arxiv.org/abs/2402.00019

**10. FDNet: Frequency Domain Denoising Network For Cell Segmentation in Astrocytes Derived From Induced Pluripotent Stem Cells**  
作者: Haoran Li,Jiahua Shi,Huaming Chen,Bo Du,Simon Maksour,Gabrielle Phillips,Mirella Dottori,Jun Shen  
摘要: Artificially generated induced pluripotent stem cells (iPSCs) from somatic cells play an important role for disease modeling and drug screening of neurodegenerative diseases. Astrocytes differentiated...  
URL: https://arxiv.org/abs/2402.02724

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## math.OC (优化与控制)

**1. Weakly Convex Regularisers for Inverse Problems: Convergence of Critical Points and Primal-Dual Optimisation**  
作者: Zakhar Shumaylov,Jeremy Budd,Subhadip Mukherjee,Carola-Bibiane Schönlieb  
摘要: Variational regularisation is the primary method for solving inverse problems, and recently there has been considerable work leveraging deeply learned regularisation for enhanced performance. However,...  
URL: https://arxiv.org/abs/2402.01052

**2. On the $O(\frac{\sqrt{d}}{T^{1/4}})$ Convergence Rate of RMSProp and Its Momentum Extension Measured by $\ell\_1$ Norm**  
作者: Huan Li,Zhouchen Lin  
摘要: Although adaptive gradient methods have been extensively used in deep learning, their convergence rates proved in the literature are all slower than that of SGD, particularly with respect to their dep...  
URL: https://arxiv.org/abs/2402.00389

**3. On the Complexity of Finite-Sum Smooth Optimization under the Polyak-Łojasiewicz Condition**  
作者: Yunyan Bai,Yuxing Liu,Luo Luo  
摘要: This paper considers the optimization problem of the form $\min\_{{\bf x}\in{\mathbb R}^d} f({\bf x})\triangleq \frac{1}{n}\sum\_{i=1}^n f\_i({\bf x})$, where $f(\cdot)$ satisfies the Polyak--Łojasiewicz...  
URL: https://arxiv.org/abs/2402.02569

**4. Neur2BiLO: Neural Bilevel Optimization**  
作者: Justin Dumouchelle,Esther Julien,Jannis Kurtz,Elias B. Khalil  
摘要: Bilevel optimization deals with nested problems in which a leader takes the first decision to minimize their objective function while accounting for a follower's best-response reaction. Constrained bi...  
URL: https://arxiv.org/abs/2402.02552

**5. Incremental Quasi-Newton Methods with Faster Superlinear Convergence Rates**  
作者: Zhuanghua Liu,Luo Luo,Bryan Kian Hsiang Low  
摘要: We consider the finite-sum optimization problem, where each component function is strongly convex and has Lipschitz continuous gradient and Hessian. The recently proposed incremental quasi-Newton meth...  
URL: https://arxiv.org/abs/2402.02359

**6. Decentralized Sum-of-Nonconvex Optimization**  
作者: Zhuanghua Liu,Bryan Kian Hsiang Low  
摘要: We consider the optimization problem of minimizing the sum-of-nonconvex function, i.e., a convex function that is the average of nonconvex components. The existing stochastic algorithms for such a pro...  
URL: https://arxiv.org/abs/2402.02356

**7. Denoising Diffusion-Based Control of Nonlinear Systems**  
作者: Karthik Elamvazhuthi,Darshan Gadginmath,Fabio Pasqualetti  
摘要: We propose a novel approach based on Denoising Diffusion Probabilistic Models (DDPMs) to control nonlinear dynamical systems. DDPMs are the state-of-art of generative models that have achieved success...  
URL: https://arxiv.org/abs/2402.02297

**8. Zeroth-Order primal-dual Alternating Projection Gradient Algorithms for Nonconvex Minimax Problems with Coupled linear Constraints**  
作者: Huiling Zhang,Zi Xu,Yuhong Dai  
摘要: In this paper, we study zeroth-order algorithms for nonconvex minimax problems with coupled linear constraints under the deterministic and stochastic settings, which have attracted wide attention in m...  
URL: https://arxiv.org/abs/2402.03352

**9. Decentralized Bilevel Optimization over Graphs: Loopless Algorithmic Update and Transient Iteration Complexity**  
作者: Boao Kong,Shuchen Zhu,Songtao Lu,Xinmeng Huang,Kun Yuan  
摘要: Stochastic bilevel optimization (SBO) is becoming increasingly essential in machine learning due to its versatility in handling nested structures. To address large-scale SBO, decentralized approaches ...  
URL: https://arxiv.org/abs/2402.03167

**10. Dual Lagrangian Learning for Conic Optimization**  
作者: Mathieu Tanneau,Pascal Van Hentenryck  
摘要: This paper presents Dual Lagrangian Learning (DLL), a principled learning methodology for dual conic optimization proxies. DLL leverages conic duality and the representation power of ML models to prov...  
URL: https://arxiv.org/abs/2402.03086

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## math.PR (可能性)

**1. Fisher information dissipation for time inhomogeneous stochastic differential equations**  
作者: Qi Feng,Xinzhe Zuo,Wuchen Li  
摘要: We provide a Lyapunov convergence analysis for time-inhomogeneous variable coefficient stochastic differential equations (SDEs). Three typical examples include overdamped, irreversible drift, and unde...  
URL: https://arxiv.org/abs/2402.01036

**2. On the resilience of the quadratic Littlewood-Offord problem**  
作者: Elad Aigner-Horev,Daniel Rosenberg,Roi Weiss  
摘要: We study the statistical resilience of the anti-concentration properties of Rademacher polynomials in face of adversarial deterministic noise taking the form of sign-flips. Given a multilinear polynom...  
URL: https://arxiv.org/abs/2402.10504

**3. A Method For Bounding Tail Probabilities**  
作者: Nikola Zlatanov  
摘要: We present a method for upper and lower bounding the right and the left tail probabilities of continuous random variables (RVs). For the right tail probability of RV $X$ with probability density funct...  
URL: https://arxiv.org/abs/2402.13662

## cs.IT (信息论)

**1. End-to-End Deep Learning for TDD MIMO Systems in the 6G Upper Midbands**  
作者: Juseong Park,Foad Sohrabi,Amitava Ghosh,Jeffrey G. Andrews  
摘要: This paper proposes and analyzes novel deep learning methods for downlink (DL) single-user multiple-input multiple-output (SU-MIMO) and multi-user MIMO (MU-MIMO) systems operating in time division dup...  
URL: https://arxiv.org/abs/2402.01033

**2. On the BER vs. Bandwidth-Efficiency Trade-offs in Windowed OTSM Dispensing with Zero-Padding**  
作者: Zeping Sui,Hongming Zhang,Hien Quoc Ngo,Michail Matthaiou,Lajos Hanzo  
摘要: An orthogonal time sequency multiplexing (OTSM) scheme using practical signaling functions is proposed under strong phase noise (PHN) scenarios. By utilizing the transform relationships between the de...  
URL: https://arxiv.org/abs/2402.01024

**3. Cell-Free Massive MIMO SWIPT with Beyond Diagonal Reconfigurable Intelligent Surfaces**  
作者: Thien Duc Hua,Mohammadali Mohammadi,Hien Quoc Ngo,Michail Matthaiou  
摘要: This paper investigates the integration of beyond-diagonal reconfigurable intelligent surfaces (BD-RISs) into cell-free massive multiple-input multiple-output (CF-mMIMO) systems, focusing on applicati...  
URL: https://arxiv.org/abs/2402.00646

**4. Endomorphisms of Linear Block Codes**  
作者: Jonathan Mandelbaum,Sisi Miao,Holger Jäkel,Laurent Schmalen  
摘要: The automorphism groups of various linear codes are extensively studied yielding insights into the respective code structure. This knowledge is used in, e.g., theoretical analysis and in improving dec...  
URL: https://arxiv.org/abs/2402.00562

**5. A Joint Communication and Computation Framework for Digital Twin over Wireless Networks**  
作者: Zhaohui Yang,Mingzhe Chen,Yuchen Liu,Zhaoyang Zhang  
摘要: In this paper, the problem of low-latency communication and computation resource allocation for digital twin (DT) over wireless networks is investigated. In the considered model, multiple physical dev...  
URL: https://arxiv.org/abs/2402.00381

**6. Learning Based Dynamic Cluster Reconfiguration for UAV Mobility Management with 3D Beamforming**  
作者: Irshad A. Meer,Karl-Ludwig Besser,Mustafa Ozger,Dominic Schupke,H. Vincent Poor,Cicek Cavdar  
摘要: In modern cell-less wireless networks, mobility management is undergoing a significant transformation, transitioning from single-link handover management to a more adaptable multi-connectivity cluster...  
URL: https://arxiv.org/abs/2402.00224

**7. Joint Activity and Data Detection for Massive Grant-Free Access Using Deterministic Non-Orthogonal Signatures**  
作者: Nam Yul Yu,Wei Yu  
摘要: Grant-free access is a key enabler for connecting wireless devices with low latency and low signaling overhead in massive machine-type communications (mMTC). For massive grant-free access, user-specif...  
URL: https://arxiv.org/abs/2402.02307

**8. Characterization of the Distortion-Perception Tradeoff for Finite Channels with Arbitrary Metrics**  
作者: Dror Freirich,Nir Weinberger,Ron Meir  
摘要: Whenever inspected by humans, reconstructed signals should not be distinguished from real ones. Typically, such a high perceptual quality comes at the price of high reconstruction error, and vice vers...  
URL: https://arxiv.org/abs/2402.02265

**9. Non-Linear Analog Processing Gains in Task-Based Quantization**  
作者: Marian Temprana Alonso,Farhad Shirani,Neil Irwin Bernardo,Yonina C. Eldar  
摘要: In task-based quantization, a multivariate analog signal is transformed into a digital signal using a limited number of low-resolution analog-to-digital converters (ADCs). This process aims to minimiz...  
URL: https://arxiv.org/abs/2402.01525

**10. Spatially Consistent Air-to-Ground Channel Modeling via Generative Neural Networks**  
作者: Amedeo Giuliani,Rasoul Nikbakht,Giovanni Geraci,Seongjoon Kang,Angel Lozano,Sundeep Rangan  
摘要: This article proposes a generative neural network architecture for spatially consistent air-to-ground channel modeling. The approach considers the trajectories of uncrewed aerial vehicles along typica...  
URL: https://arxiv.org/abs/2402.03517

... 以及其他 42 篇论文

## physics.data-an (数据分析、统计和概率)

**1. Response Theory via Generative Score Modeling**  
作者: Ludovico Theo Giorgini,Katherine Deck,Tobias Bischoff,Andre Souza  
摘要: We introduce an approach for analyzing the responses of dynamical systems to external perturbations that combines score-based generative modeling with the Generalized Fluctuation-Dissipation Theorem (...  
URL: https://arxiv.org/abs/2402.01029

## cs.SE (软件工程)

**1. Towards Understanding the Challenges of Bug Localization in Deep Learning Systems**  
作者: Sigma Jahan,Mehil B. Shah,Mohammad Masudur Rahman  
摘要: Software bugs cost the global economy billions of dollars annually and claim ~50\% of the programming time from software developers. Locating these bugs is crucial for their resolution but challenging...  
URL: https://arxiv.org/abs/2402.01021

**2. Semantic Constraint Inference for Web Form Test Generation**  
作者: Parsa Alian,Noor Nashid,Mobina Shahbandeh,Ali Mesbah  
摘要: Automated test generation for web forms has been a longstanding challenge, exacerbated by the intrinsic human-centric design of forms and their complex, device-agnostic structures. We introduce an inn...  
URL: https://arxiv.org/abs/2402.00950

**3. Fine-Tuning and Prompt Engineering for Large Language Models-based Code Review Automation**  
作者: Chanathip Pornprasit,Chakkrit Tantithamthavorn  
摘要: Context: The rapid evolution of Large Language Models (LLMs) has sparked significant interest in leveraging their capabilities for automating code review processes. Prior studies often focus on develo...  
URL: https://arxiv.org/abs/2402.00905

**4. BIOMERO: BioImage analysis in OMERO**  
作者: Torec T. Luik,Rodrigo Rosas-Bertolini,Eric A. J. Reits,Ron A. Hoebe,Przemek M. Krawczyk  
摘要: In the rapidly evolving field of bioimaging, the integration and orchestration of Findable, Accessible, Interoperable, and Reusable (FAIR) image analysis workflows remains a challenge. We introduce BI...  
URL: https://arxiv.org/abs/2402.00734

**5. PeaTMOSS: A Dataset and Initial Analysis of Pre-Trained Models in Open-Source Software**  
作者: Wenxin Jiang,Jerin Yasmin,Jason Jones,Nicholas Synovic,Jiashen Kuo,Nathaniel Bielanski,Yuan Tian,George K. Thiruvathukal,James C. Davis  
摘要: The development and training of deep learning models have become increasingly costly and complex. Consequently, software engineers are adopting pre-trained models (PTMs) for their downstream applicati...  
URL: https://arxiv.org/abs/2402.00699

**6. Pre-training by Predicting Program Dependencies for Vulnerability Analysis Tasks**  
作者: Zhongxin Liu,Zhijie Tang,Junwei Zhang,Xin Xia,Xiaohu Yang  
摘要: Vulnerability analysis is crucial for software security. This work focuses on using pre-training techniques to enhance the understanding of vulnerable code and boost vulnerability analysis. The code u...  
URL: https://arxiv.org/abs/2402.00657

**7. Towards Summarizing Code Snippets Using Pre-Trained Transformers**  
作者: Antonio Mastropaolo,Matteo Ciniselli,Luca Pascarella,Rosalia Tufano,Emad Aghajani,Gabriele Bavota  
摘要: When comprehending code, a helping hand may come from the natural language comments documenting it that, unfortunately, are not always there. To support developers in such a scenario, several techniqu...  
URL: https://arxiv.org/abs/2402.00519

**8. Large Language Models Based Fuzzing Techniques: A Survey**  
作者: Linghan Huang,Peizhou Zhao,Huaming Chen,Lei Ma  
摘要: In the modern era where software plays a pivotal role, software security and vulnerability analysis have become essential for software development. Fuzzing test, as an efficient software testing metho...  
URL: https://arxiv.org/abs/2402.00350

**9. Towards AI-Assisted Synthesis of Verified Dafny Methods**  
作者: Md Rakib Hossain Misu,Cristina V. Lopes,Iris Ma,James Noble  
摘要: Large language models show great promise in many domains, including programming. A promise is easy to make but hard to keep, and language models often fail to keep their promises, generating erroneous...  
URL: https://arxiv.org/abs/2402.00247

**10. An Architecture for Software Engineering Gamification**  
作者: Óscar Pedreira,Félix García,Mario Piattini,Alejandro Cortiñas,Ana Cerdeira-Pena  
摘要: Gamification has been applied in software engineering to improve quality and results by increasing people's motivation and engagement. A systematic mapping has identified research gaps in the field, o...  
URL: https://arxiv.org/abs/2402.00233

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## cs.DM (离散数学)

**1. RDNF Oriented Analytics to Random Boolean Functions**  
作者: Levon Aslanyan,Irina Arsenyan,Vilik Karakhanyan,Hasmik Sahakyan  
摘要: Dominant areas of computer science and computation systems are intensively linked to the hypercube-related studies and interpretations. This article presents some transformations and analytics for som...  
URL: https://arxiv.org/abs/2402.00999

**2. Independent set reconfiguration in H-free graphs**  
作者: Valentin Bartier,Nicolas Bousquet,Moritz Mühlenthaler  
摘要: Given a graph $G$ and two independent sets of $G$, the independent set reconfiguration problem asks whether one independent set can be transformed into the other by moving a single vertex at a time, s...  
URL: https://arxiv.org/abs/2402.03063

**3. Growth Rate of the Number of Empty Triangles in the Plane**  
作者: Bhaswar B. Bhattacharya,Sandip Das,Sk Samim Islam,Saumya Sen  
摘要: Given a set $P$ of $n$ points in the plane, in general position, denote by $N\_Δ(P)$ the number of empty triangles with vertices in $P$. In this paper we investigate by how much $N\_Δ(P)$ changes if a p...  
URL: https://arxiv.org/abs/2402.07775

**4. Monotonicity of the cops and robber game for bounded depth treewidth**  
作者: Isolde Adler,Eva Fluck  
摘要: We study a variation of the cops and robber game characterising treewidth, where in each play at most q cops can be placed in order to catch the robber, where q is a parameter of the game. We prove th...  
URL: https://arxiv.org/abs/2402.09139

**5. Symbolic Listings as Computation**  
作者: Hamilton Sawczuk,Edinah Gnang  
摘要: We propose an algebraic model of computation which formally relates symbolic listings, complexity of Boolean functions, and low depth arithmetic circuit complexity. In this model algorithms are arithm...  
URL: https://arxiv.org/abs/2402.15885

**6. Box Facets and Cut Facets of Lifted Multicut Polytopes**  
作者: Lucas Fabian Naumann,Jannik Irmai,Shengxian Zhao,Bjoern Andres  
摘要: The lifted multicut problem is a combinatorial optimization problem whose feasible solutions relate one-to-one to the decompositions of a graph $G = (V, E)$. Given an augmentation $\widehat{G} = (V, E...  
URL: https://arxiv.org/abs/2402.16814

## cs.LO (计算机科学中的逻辑)

**1. Multiset Bisimulations as a Common Framework for Ordinary and Probabilistic Bisimulations**  
作者: David de Frutos-Escrig,Miguel Palomino,Ignacio Fábregas  
摘要: Our concrete objective is to present both ordinary bisimulations and probabilistic bisimulations in a common coalgebraic framework based on multiset bisimulations. For that we show how to relate the u...  
URL: https://arxiv.org/abs/2402.00962

**2. Bialgebraic Reasoning on Higher-Order Program Equivalence**  
作者: Sergey Goncharov,Stefan Milius,Stelios Tsampas,Henning Urbat  
摘要: Logical relations constitute a key method for reasoning about contextual equivalence of programs in higher-order languages. They are usually developed on a per-case basis, with a new theory required f...  
URL: https://arxiv.org/abs/2402.00625

**3. The Maude strategy language**  
作者: Steven Eker,Narciso Martí-Oliet,José Meseguer,Rubén Rubio,Alberto Verdejo  
摘要: Rewriting logic is a natural and expressive framework for the specification of concurrent systems and logics. The Maude specification language provides an implementation of this formalism that allows ...  
URL: https://arxiv.org/abs/2402.00275

**4. Efficient compilation of expressive problem space specifications to neural network solvers**  
作者: Matthew L. Daggitt,Wen Kokke,Robert Atkey  
摘要: Recent work has described the presence of the embedding gap in neural network verification. On one side of the gap is a high-level specification about the network's behaviour, written by a domain expe...  
URL: https://arxiv.org/abs/2402.01353

**5. Synthesizing Strongly Equivalent Logic Programs: Beth Definability for Answer Set Programs via Craig Interpolation in First-Order Logic**  
作者: Jan Heuer,Christoph Wernhard  
摘要: We show a projective Beth definability theorem for logic programs under the stable model semantics: For given programs $P$ and $Q$ and vocabulary $V$ (set of predicates) the existence of a program $R$...  
URL: https://arxiv.org/abs/2402.07696

**6. Towards benchmarking of Solidity verification tools**  
作者: Massimo Bartoletti,Fabio Fioravanti,Giulia Matricardi,Roberto Pettinau,Franco Sainas  
摘要: Formal verification of smart contracts has become a hot topic in academic and industrial research, given the growing value of assets managed by decentralized applications and the consequent incentive ...  
URL: https://arxiv.org/abs/2402.10750

**7. Confluence of Logically Constrained Rewrite Systems Revisited**  
作者: Jonas Schöpf,Fabian Mitterwallner,Aart Middeldorp  
摘要: We show that (local) confluence of terminating locally constrained rewrite systems is undecidable, even when the underlying theory is decidable. Several confluence criteria for logically constrained r...  
URL: https://arxiv.org/abs/2402.13552

**8. Effective MSO-Definability for Tree-width Bounded Models of an Inductive Separation Logic of Relations**  
作者: Lucas Bueri,Radu Iosif,Florian Zuleger  
摘要: A class of graph languages is definable in Monadic Second-Order logic (MSO) if and only if it consists of sets of models of MSO formulæ. If, moreover, there is a computable bound on the tree-widths of...  
URL: https://arxiv.org/abs/2402.16150

**9. Equational Bit-Vector Solving via Strong Gröbner Bases**  
作者: Jiaxin Song,Hongfei Fu,Charles Zhang  
摘要: Bit-vectors, which are integers in a finite number of bits, are ubiquitous in software and hardware systems. In this work, we consider the satisfiability modulo theories (SMT) of bit-vectors. Unlike n...  
URL: https://arxiv.org/abs/2402.16314

**10. A Constraint-based Mathematical Modeling Library in Prolog with Answer Constraint Semantics**  
作者: François Fages  
摘要: Constraint logic programming emerged in the late 80's as a highly declarative class of programming languages based on first-order logic and theories with decidable constraint languages, thereby subsum...  
URL: https://arxiv.org/abs/2402.17286

## math.AG (代数几何)

**1. Geometry of Polynomial Neural Networks**  
作者: Kaie Kubjas,Jiayi Li,Maximilian Wiesmann  
摘要: We study the expressivity and learning process for polynomial neural networks (PNNs) with monomial activation functions. The weights of the network parametrize the neuromanifold. In this paper, we stu...  
URL: https://arxiv.org/abs/2402.00949

## hep-th (高能物理 - 理论)

**1. NCoder -- A Quantum Field Theory approach to encoding data**  
作者: David S. Berman,Marc S. Klinger,Alexander G. Stapleton  
摘要: In this paper we present a novel approach to interpretable AI inspired by Quantum Field Theory (QFT) which we call the NCoder. The NCoder is a modified autoencoder neural network whose latent layer is...  
URL: https://arxiv.org/abs/2402.00944

**2. Rigor with Machine Learning from Field Theory to the Poincaré Conjecture**  
作者: Sergei Gukov,James Halverson,Fabian Ruehle  
摘要: Machine learning techniques are increasingly powerful, leading to many breakthroughs in the natural sciences, but they are often stochastic, error-prone, and blackbox. How, then, should they be utiliz...  
URL: https://arxiv.org/abs/2402.13321

## cs.DS (数据结构和算法)

**1. Approximate Nearest Neighbor Search with Window Filters**  
作者: Joshua Engels,Benjamin Landrum,Shangdi Yu,Laxman Dhulipala,Julian Shun  
摘要: We define and investigate the problem of $\textit{c-approximate window search}$: approximate nearest neighbor search where each point in the dataset has a numeric label, and the goal is to find neares...  
URL: https://arxiv.org/abs/2402.00943

**2. Revising Apetrei's bounding volume hierarchy construction algorithm to allow stackless traversal**  
作者: Andrey Prokopenko,Damien Lebrun-Grandié  
摘要: Stackless traversal is a technique to speed up range queries by avoiding usage of a stack during the tree traversal. One way to achieve that is to transform a given binary tree to store a left child a...  
URL: https://arxiv.org/abs/2402.00665

**3. Not All Learnable Distribution Classes are Privately Learnable**  
作者: Mark Bun,Gautam Kamath,Argyris Mouzakis,Vikrant Singhal  
摘要: We give an example of a class of distributions that is learnable in total variation distance with a finite number of samples, but not learnable under $(\varepsilon, δ)$-differential privacy. This refu...  
URL: https://arxiv.org/abs/2402.00267

**4. Decomposable Submodular Maximization in Federated Setting**  
作者: Akbar Rafiey  
摘要: Submodular functions, as well as the sub-class of decomposable submodular functions, and their optimization appear in a wide range of applications in machine learning, recommendation systems, and welf...  
URL: https://arxiv.org/abs/2402.00138

**5. Simple Symmetric Sustainable Sorting -- the greeNsort article**  
作者: Jens Oehlschlägel  
摘要: We explored an uncharted part of the solution space for sorting algorithms: the role of symmetry in divide&conquer algorithms. We found/designed novel simple binary Quicksort and Mergesort algorithms ...  
URL: https://arxiv.org/abs/2402.01816

**6. Algorithms and Complexity of Difference Logic**  
作者: Konrad K. Dabrowski,Peter Jonsson,Sebastian Ordyniak,George Osipov  
摘要: Difference Logic (DL) is a fragment of linear arithmetics where atoms are constraints x+k <= y for variables x,y (ranging over Q or Z) and integer k. We study the complexity of deciding the truth of e...  
URL: https://arxiv.org/abs/2402.03273

**7. Accelerating Matroid Optimization through Fast Imprecise Oracles**  
作者: Franziska Eberle,Felix Hommelsheim,Alexander Lindermayr,Zhenwei Liu,Nicole Megow,Jens Schlöter  
摘要: Querying complex models for precise information (e.g. traffic models, database systems, large ML models) often entails intense computations and results in long response times. Thus, weaker models whic...  
URL: https://arxiv.org/abs/2402.02774

**8. An Effective Branch-and-Bound Algorithm with New Bounding Methods for the Maximum $s$-Bundle Problem**  
作者: Jinghui Xue,Jiongzhi Zheng,Mingming Jin,Kun He  
摘要: The Maximum s-Bundle Problem (MBP) addresses the task of identifying a maximum s-bundle in a given graph. A graph G=(V, E) is called an s-bundle if its vertex connectivity is at least |V|-s, where the...  
URL: https://arxiv.org/abs/2402.03736

**9. ShiftDTW: adapting the DTW metric for cyclic time series clustering**  
作者: Lucas Foulon,Ilyes Korichi,Xavier Millot  
摘要: The elasticity of the DTW metric provides a more flexible comparison between time series and is used in numerous machine learning domains such as classification or clustering. However, it does not ali...  
URL: https://arxiv.org/abs/2402.05631

**10. Low-degree phase transitions for detecting a planted clique in sublinear time**  
作者: Jay Mardia,Kabir Aladin Verchand,Alexander S. Wein  
摘要: We consider the problem of detecting a planted clique of size $k$ in a random graph on $n$ vertices. When the size of the clique exceeds $Θ(\sqrt{n})$, polynomial-time algorithms for detection prolife...  
URL: https://arxiv.org/abs/2402.05451

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## q-bio.GN (基因组学)

**1. A Comparative Analysis of Gene Expression Profiling by Statistical and Machine Learning Approaches**  
作者: Myriam Bontonou,Anaïs Haget,Maria Boulougouri,Benjamin Audit,Pierre Borgnat,Jean-Michel Arbona  
摘要: Many machine learning models have been proposed to classify phenotypes from gene expression data. In addition to their good performance, these models can potentially provide some understanding of phen...  
URL: https://arxiv.org/abs/2402.00926

**2. Unlocking the Power of Multi-institutional Data: Integrating and Harmonizing Genomic Data Across Institutions**  
作者: Yuan Chen,Ronglai Shen,Xiwen Feng,Katherine Panageas  
摘要: Cancer is a complex disease driven by genomic alterations, and tumor sequencing is becoming a mainstay of clinical care for cancer patients. The emergence of multi-institution sequencing data presents...  
URL: https://arxiv.org/abs/2402.00077

**3. Predicting loss-of-function impact of genetic mutations: a machine learning approach**  
作者: Arshmeet Kaur,Morteza Sarmadi  
摘要: The innovation of next-generation sequencing (NGS) techniques has significantly reduced the price of genome sequencing, lowering barriers to future medical research; it is now feasible to apply genome...  
URL: https://arxiv.org/abs/2402.00054

**4. Pairwise Rearrangement is Fixed-Parameter Tractable in the Single Cut-and-Join Model**  
作者: Lora Bailey,Heather Smith Blake,Garner Cochran,Nathan Fox,Michael Levet,Reem Mahmoud,Inne Singgih,Grace Stadnyk,Alexander Wiedemann  
摘要: Genome rearrangement is a common model for molecular evolution. In this paper, we consider the Pairwise Rearrangement problem, which takes as input two genomes and asks for the number of minimum-lengt...  
URL: https://arxiv.org/abs/2402.01942

**5. PhenoLinker: Phenotype-Gene Link Prediction and Explanation using Heterogeneous Graph Neural Networks**  
作者: Jose L. Mellina Andreu,Luis Bernal,Antonio F. Skarmeta,Mina Ryten,Sara Álvarez,Alejandro Cisterna García,Juan A. Botía  
摘要: The association of a given human phenotype to a genetic variant remains a critical challenge for biology. We present a novel system called PhenoLinker capable of associating a score to a phenotype-gen...  
URL: https://arxiv.org/abs/2402.01809

**6. DiscDiff: Latent Diffusion Model for DNA Sequence Generation**  
作者: Zehui Li,Yuhao Ni,William A V Beardall,Guoxuan Xia,Akashaditya Das,Guy-Bart Stan,Yiren Zhao  
摘要: This paper introduces a novel framework for DNA sequence generation, comprising two key components: DiscDiff, a Latent Diffusion Model (LDM) tailored for generating discrete DNA sequences, and Absorb-...  
URL: https://arxiv.org/abs/2402.06079

**7. Machine learning applied to omics data**  
作者: Aida Calviño,Almudena Moreno-Ribera,Silvia Pineda  
摘要: In this chapter we illustrate the use of some Machine Learning techniques in the context of omics data. More precisely, we review and evaluate the use of Random Forest and Penalized Multinomial Logist...  
URL: https://arxiv.org/abs/2402.05543

**8. Highly Accurate Disease Diagnosis and Highly Reproducible Biomarker Identification with PathFormer**  
作者: Zehao Dong,Qihang Zhao,Philip R. O. Payne,Michael A Province,Carlos Cruchaga,Muhan Zhang,Tianyu Zhao,Yixin Chen,Fuhai Li  
摘要: Biomarker identification is critical for precise disease diagnosis and understanding disease pathogenesis in omics data analysis, like using fold change and regression analysis. Graph neural networks ...  
URL: https://arxiv.org/abs/2402.07268

**9. Efficient and Scalable Fine-Tune of Language Models for Genome Understanding**  
作者: Huixin Zhan,Ying Nian Wu,Zijun Zhang  
摘要: Although DNA foundation models have advanced the understanding of genomes, they still face significant challenges in the limited scale and diversity of genomic data. This limitation starkly contrasts ...  
URL: https://arxiv.org/abs/2402.08075

**10. DNABERT-S: Pioneering Species Differentiation with Species-Aware DNA Embeddings**  
作者: Zhihan Zhou,Weimin Wu,Harrison Ho,Jiayi Wang,Lizhen Shi,Ramana V Davuluri,Zhong Wang,Han Liu  
摘要: We introduce DNABERT-S, a tailored genome model that develops species-aware embeddings to naturally cluster and segregate DNA sequences of different species in the embedding space. Differentiating spe...  
URL: https://arxiv.org/abs/2402.08777

... 以及其他 4 篇论文

## cs.SD (声音)

**1. Screening method for early dementia using sound objects as voice biomarkers**  
作者: Adam Pluta,Zbigniew Pioch,Jędrzej Kardach,Piotr Zioło,Tomasz Kręcicki,Elżbieta Trypka  
摘要: Introduction: We present a screening method for early dementia using features based on sound objects as voice biomarkers. Methods: The final dataset used for machine learning models consisted of 266 o...  
URL: https://arxiv.org/abs/2402.00897

**2. EVA-GAN: Enhanced Various Audio Generation via Scalable Generative Adversarial Networks**  
作者: Shijia Liao,Shiyi Lan,Arun George Zachariah  
摘要: The advent of Large Models marks a new era in machine learning, significantly outperforming smaller models by leveraging vast datasets to capture and synthesize complex patterns. Despite these advance...  
URL: https://arxiv.org/abs/2402.00892

**3. BATON: Aligning Text-to-Audio Model with Human Preference Feedback**  
作者: Huan Liao,Haonan Han,Kai Yang,Tianjiao Du,Rui Yang,Zunnan Xu,Qinmei Xu,Jingquan Liu,Jiasheng Lu,Xiu Li  
摘要: With the development of AI-Generated Content (AIGC), text-to-audio models are gaining widespread attention. However, it is challenging for these models to generate audio aligned with human preference ...  
URL: https://arxiv.org/abs/2402.00744

**4. Adversarial Data Augmentation for Robust Speaker Verification**  
作者: Zhenyu Zhou,Junhui Chen,Namin Wang,Lantian Li,Dong Wang  
摘要: Data augmentation (DA) has gained widespread popularity in deep speaker models due to its ease of implementation and significant effectiveness. It enriches training data by simulating real-life acoust...  
URL: https://arxiv.org/abs/2402.02699

**5. Sentiment analysis in non-fixed length audios using a Fully Convolutional Neural Network**  
作者: María Teresa García-Ordás,Héctor Alaiz-Moretón,José Alberto Benítez-Andrades,Isaías García-Rodríguez,Oscar García-Olalla,Carmen Benavides  
摘要: In this work, a sentiment analysis method that is capable of accepting audio of any length, without being fixed a priori, is proposed. Mel spectrogram and Mel Frequency Cepstral Coefficients are used ...  
URL: https://arxiv.org/abs/2402.02184

**6. Natural language guidance of high-fidelity text-to-speech with synthetic annotations**  
作者: Dan Lyth,Simon King  
摘要: Text-to-speech models trained on large-scale datasets have demonstrated impressive in-context learning capabilities and naturalness. However, control of speaker identity and style in these models typi...  
URL: https://arxiv.org/abs/2402.01912

**7. Audio Flamingo: A Novel Audio Language Model with Few-Shot Learning and Dialogue Abilities**  
作者: Zhifeng Kong,Arushi Goel,Rohan Badlani,Wei Ping,Rafael Valle,Bryan Catanzaro  
摘要: Augmenting large language models (LLMs) to understand audio -- including non-speech sounds and non-verbal speech -- is critically important for diverse real-world applications of LLMs. In this paper, ...  
URL: https://arxiv.org/abs/2402.01831

**8. Identification of Cognitive Decline from Spoken Language through Feature Selection and the Bag of Acoustic Words Model**  
作者: Marko Niemelä,Mikaela von Bonsdorff,Sami Äyrämö,Tommi Kärkkäinen  
摘要: Memory disorders are a central factor in the decline of functioning and daily activities in elderly individuals. The confirmation of the illness, initiation of medication to slow its progression, and ...  
URL: https://arxiv.org/abs/2402.01824

**9. SpecDiff-GAN: A Spectrally-Shaped Noise Diffusion GAN for Speech and Music Synthesis**  
作者: Teysir Baoueb,Haocheng Liu,Mathieu Fontaine,Jonathan Le Roux,Gael Richard  
摘要: Generative adversarial network (GAN) models can synthesize highquality audio signals while ensuring fast sample generation. However, they are difficult to train and are prone to several issues includi...  
URL: https://arxiv.org/abs/2402.01753

**10. Spiking Music: Audio Compression with Event Based Auto-encoders**  
作者: Martim Lisboa,Guillaume Bellec  
摘要: Neurons in the brain communicate information via punctual events called spikes. The timing of spikes is thought to carry rich information, but it is not clear how to leverage this in digital systems. ...  
URL: https://arxiv.org/abs/2402.01571

... 以及其他 59 篇论文

## cs.NI (网络和互联网架构)

**1. On the Interplay of Artificial Intelligence and Space-Air-Ground Integrated Networks: A Survey**  
作者: Adilya Bakambekova,Nour Kouzayha,Tareq Al-Naffouri  
摘要: Space-Air-Ground Integrated Networks (SAGINs), which incorporate space and aerial networks with terrestrial wireless systems, are vital enablers of the emerging sixth-generation (6G) wireless networks...  
URL: https://arxiv.org/abs/2402.00881

**2. Graph Representation Learning for Contention and Interference Management in Wireless Networks**  
作者: Zhouyou Gu,Branka Vucetic,Kishore Chikkam,Pasquale Aliberti,Wibowo Hardjawana  
摘要: Restricted access window (RAW) in Wi-Fi 802.11ah networks manages contention and interference by grouping users and allocating periodic time slots for each group's transmissions. We will find the opti...  
URL: https://arxiv.org/abs/2402.00879

**3. Radio Map Estimation -- An Open Dataset with Directive Transmitter Antennas and Initial Experiments**  
作者: Fabian Jaensch,Giuseppe Caire,Begüm Demir  
摘要: Over the last years, several works have explored the application of deep learning algorithms to determine the large-scale signal fading (also referred to as ``path loss'') between transmitter and rece...  
URL: https://arxiv.org/abs/2402.00878

**4. Building Blocks to Empower Cognitive Internet with Hybrid Edge Cloud**  
作者: Siavash Alamouti,Fay Arjomandi,Michel Burger,Bashar Altakrouri  
摘要: As we transition from the mobile internet to the 'Cognitive Internet,' a significant shift occurs in how we engage with technology and intelligence. We contend that the Cognitive Internet goes beyond ...  
URL: https://arxiv.org/abs/2402.00876

**5. A YANG-aided Unified Strategy for Black Hole Detection for Backbone Networks**  
作者: Elif Ak,Kiymet Kaya,Eren Ozaltun,Sule Gunduz Oguducu,Berk Canberk  
摘要: Despite the crucial importance of addressing Black Hole failures in Internet backbone networks, effective detection strategies in backbone networks are lacking. This is largely because previous resear...  
URL: https://arxiv.org/abs/2402.00831

**6. Interference-Aware Emergent Random Access Protocol for Downlink LEO Satellite Networks**  
作者: Chang-Yong Lim,Jihong Park,Jinho Choi,Ju-Hyung Lee,Daesub Oh,Heewook Kim  
摘要: In this article, we propose a multi-agent deep reinforcement learning (MADRL) framework to train a multiple access protocol for downlink low earth orbit (LEO) satellite networks. By improving the exis...  
URL: https://arxiv.org/abs/2402.02350

**7. NetLLM: Adapting Large Language Models for Networking**  
作者: Duo Wu,Xianda Wang,Yaqi Qiao,Zhi Wang,Junchen Jiang,Shuguang Cui,Fangxin Wang  
摘要: Many networking tasks now employ deep learning (DL) to solve complex prediction and optimization problems. However, current design philosophy of DL-based algorithms entails intensive engineering overh...  
URL: https://arxiv.org/abs/2402.02338

**8. Large Multi-Modal Models (LMMs) as Universal Foundation Models for AI-Native Wireless Systems**  
作者: Shengzhe Xu,Christo Kurisummoottil Thomas,Omar Hashash,Nikhil Muralidhar,Walid Saad,Naren Ramakrishnan  
摘要: Large language models (LLMs) and foundation models have been recently touted as a game-changer for 6G systems. However, recent efforts on LLMs for wireless networks are limited to a direct application...  
URL: https://arxiv.org/abs/2402.01748

**9. Knowledge-Driven Deep Learning Paradigms for Wireless Network Optimization in 6G**  
作者: Ruijin Sun,Nan Cheng,Changle Li,Fangjiong Chen,Wen Chen  
摘要: In the sixth-generation (6G) networks, newly emerging diversified services of massive users in dynamic network environments are required to be satisfied by multi-dimensional heterogeneous resources. T...  
URL: https://arxiv.org/abs/2402.01665

**10. Edge Offloading in Smart Grid**  
作者: Gabriel Ioan Arcas,Tudor Cioara,Ionut Anghel,Dragos Lazea,Anca Hangan  
摘要: The energy transition supports the shift towards more sustainable energy alternatives, paving towards decentralized smart grids, where the energy is generated closer to the point of use. The decentral...  
URL: https://arxiv.org/abs/2402.01664

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## cs.CY (计算机与社会)

**1. Common errors in Generative AI systems used for knowledge extraction in the climate action domain**  
作者: Denis Havlik,Marcelo Pias  
摘要: Large Language Models (LLMs) and, more specifically, the Generative Pre-Trained Transformers (GPT) can help stakeholders in climate action explore digital knowledge bases and extract and utilize clima...  
URL: https://arxiv.org/abs/2402.00830

**2. Responsible developments and networking research: a reflection beyond a paper ethical statement**  
作者: Daphne Tuncer,Marc Bruyere  
摘要: Several recent initiatives have proposed new directions for research practices and their operations in the computer science community, from updated codes of conduct that clarify the use of AI-assisted...  
URL: https://arxiv.org/abs/2402.00442

**3. Catalyzing Equity in STEM Teams: Harnessing Generative AI for Inclusion and Diversity**  
作者: Nia Nixon,Yiwen Lin,Lauren Snow  
摘要: Collaboration is key to STEM, where multidisciplinary team research can solve complex problems. However, inequality in STEM fields hinders their full potential, due to persistent psychological barrier...  
URL: https://arxiv.org/abs/2402.00037

**4. Exploring Public Opinion on Responsible AI Through The Lens of Cultural Consensus Theory**  
作者: Necdet Gurkan,Jordan W. Suchow  
摘要: As the societal implications of Artificial Intelligence (AI) continue to grow, the pursuit of responsible AI necessitates public engagement in its development and governance processes. This involvemen...  
URL: https://arxiv.org/abs/2402.00029

**5. Deploying ADVISER: Impact and Lessons from Using Artificial Intelligence for Child Vaccination Uptake in Nigeria**  
作者: Opadele Kehinde,Ruth Abdul,Bose Afolabi,Parminder Vir,Corinne Namblard,Ayan Mukhopadhyay,Abiodun Adereni  
摘要: More than 5 million children under five years die from largely preventable or treatable medical conditions every year, with an overwhelmingly large proportion of deaths occurring in underdeveloped cou...  
URL: https://arxiv.org/abs/2402.00017

**6. No More Trade-Offs. GPT and Fully Informative Privacy Policies**  
作者: Przemysław Pałka,Marco Lippi,Francesca Lagioia,Rūta Liepiņa,Giovanni Sartor  
摘要: The paper reports the results of an experiment aimed at testing to what extent ChatGPT 3.5 and 4 is able to answer questions regarding privacy policies designed in the new format that we propose. In a...  
URL: https://arxiv.org/abs/2402.00013

**7. Choosing the Right Path for AI Integration in Engineering Companies: A Strategic Guide**  
作者: Rimma Dzhusupova,Jan Bosch,Helena Holmstrom Olsson  
摘要: The Engineering, Procurement and Construction (EPC) businesses operating within the energy sector are recognizing the increasing importance of Artificial Intelligence (AI). Many EPC companies and thei...  
URL: https://arxiv.org/abs/2402.00011

**8. Going Viral: An Analysis of Advertising of Technology Products on TikTok**  
作者: Ekansh Agrawal  
摘要: Social media has transformed the advertising landscape, becoming an essential tool for reaching and connecting with consumers. Its sharing and engagement features amplify brand exposure, while its cos...  
URL: https://arxiv.org/abs/2402.00010

**9. The Gig's Up: How ChatGPT Stacks Up Against Quora on Gig Economy Insights**  
作者: Thomas Lancaster  
摘要: Generative AI is changing the way in which humans seek to find answers to questions in different fields including on the gig economy and labour markets, but there is limited information available abou...  
URL: https://arxiv.org/abs/2402.02676

**10. Machine Intelligence in Africa: a survey**  
作者: Allahsera Auguste Tapo,Ali Traore,Sidy Danioko,Hamidou Tembine  
摘要: In the last 5 years, the availability of large audio datasets in African countries has opened unlimited opportunities to build machine intelligence (MI) technologies that are closer to the people and ...  
URL: https://arxiv.org/abs/2402.02218

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## eess.AS (音频和语音处理)

**1. Efficient Fine-tuning of Audio Spectrogram Transformers via Soft Mixture of Adapters**  
作者: Umberto Cappellazzo,Daniele Falavigna,Alessio Brutti  
摘要: Mixture of Experts (MoE) architectures have recently started burgeoning due to their ability to scale model's capacity while maintaining the computational cost affordable. Furthermore, they can be app...  
URL: https://arxiv.org/abs/2402.00828

**2. An Analysis of the Variance of Diffusion-based Speech Enhancement**  
作者: Bunlong Lay,Timo Gerkmann  
摘要: Diffusion models proved to be powerful models for generative speech enhancement. In recent SGMSE+ approaches, training involves a stochastic differential equation for the diffusion process, adding bot...  
URL: https://arxiv.org/abs/2402.00811

**3. PAM: Prompting Audio-Language Models for Audio Quality Assessment**  
作者: Soham Deshmukh,Dareen Alharthi,Benjamin Elizalde,Hannes Gamper,Mahmoud Al Ismail,Rita Singh,Bhiksha Raj,Huaming Wang  
摘要: While audio quality is a key performance metric for various audio processing tasks, including generative modeling, its objective measurement remains a challenge. Audio-Language Models (ALMs) are pre-t...  
URL: https://arxiv.org/abs/2402.00282

**4. Online speaker diarization of meetings guided by speech separation**  
作者: Elio Gruttadauria,Mathieu Fontaine,Slim Essid  
摘要: Overlapped speech is notoriously problematic for speaker diarization systems. Consequently, the use of speech separation has recently been proposed to improve their performance. Although promising, sp...  
URL: https://arxiv.org/abs/2402.00067

**5. Description on IEEE ICME 2024 Grand Challenge: Semi-supervised Acoustic Scene Classification under Domain Shift**  
作者: Jisheng Bai,Mou Wang,Haohe Liu,Han Yin,Yafei Jia,Siwei Huang,Yutong Du,Dongzhe Zhang,Dongyuan Shi,Woon-Seng Gan,Mark D. Plumbley,Susanto Rahardja,Bin Xiang,Jianfeng Chen  
摘要: Acoustic scene classification (ASC) is a crucial research problem in computational auditory scene analysis, and it aims to recognize the unique acoustic characteristics of an environment. One of the c...  
URL: https://arxiv.org/abs/2402.02694

**6. Predicting positive transfer for improved low-resource speech recognition using acoustic pseudo-tokens**  
作者: Nay San,Georgios Paraskevopoulos,Aryaman Arora,Xiluo He,Prabhjot Kaur,Oliver Adams,Dan Jurafsky  
摘要: While massively multilingual speech models like wav2vec 2.0 XLSR-128 can be directly fine-tuned for automatic speech recognition (ASR), downstream performance can still be relatively poor on languages...  
URL: https://arxiv.org/abs/2402.02302

**7. Speech foundation models in healthcare: Effect of layer selection on pathological speech feature prediction**  
作者: Daniela A. Wiepert,Rene L. Utianski,Joseph R. Duffy,John L. Stricker,Leland R. Barnard,David T. Jones,Hugo Botha  
摘要: Accurately extracting clinical information from speech is critical to the diagnosis and treatment of many neurological conditions. As such, there is interest in leveraging AI for automatic, objective ...  
URL: https://arxiv.org/abs/2402.01796

**8. Introduction to speech recognition**  
作者: Gabriel Dauphin  
摘要: This document contains lectures and practical experimentations using Matlab and implementing a system which is actually correctly classifying three words (one, two and three) with the help of a very s...  
URL: https://arxiv.org/abs/2402.01778

**9. Identifying False Content and Hate Speech in Sinhala YouTube Videos by Analyzing the Audio**  
作者: W. A. K. M. Wickramaarachchi,Sameeri Sathsara Subasinghe,K. K. Rashani Tharushika Wijerathna,A. Sahashra Udani Athukorala,Lakmini Abeywardhana,A. Karunasena  
摘要: YouTube faces a global crisis with the dissemination of false information and hate speech. To counter these issues, YouTube has implemented strict rules against uploading content that includes false i...  
URL: https://arxiv.org/abs/2402.01752

**10. BAT: Learning to Reason about Spatial Sounds with Large Language Models**  
作者: Zhisheng Zheng,Puyuan Peng,Ziyang Ma,Xie Chen,Eunsol Choi,David Harwath  
摘要: Spatial sound reasoning is a fundamental human skill, enabling us to navigate and interpret our surroundings based on sound. In this paper we present BAT, which combines the spatial sound perception a...  
URL: https://arxiv.org/abs/2402.01591

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## math.NA (数值分析)

**1. Resolution invariant deep operator network for PDEs with complex geometries**  
作者: Jianguo Huang,Yue Qiu  
摘要: Neural operators (NO) are discretization invariant deep learning methods with functional output and can approximate any continuous operator. NO have demonstrated the superiority of solving partial dif...  
URL: https://arxiv.org/abs/2402.00825

**2. Mesh motion in fluid-structure interaction with deep operator networks**  
作者: Ottar Hellan  
摘要: A mesh motion model based on deep operator networks is presented. The model is trained on and evaluated against a biharmonic mesh motion model on a fluid-structure interaction benchmark problem and fu...  
URL: https://arxiv.org/abs/2402.00774

**3. A practical existence theorem for reduced order models based on convolutional autoencoders**  
作者: Nicola Rares Franco,Simone Brugiapaglia  
摘要: In recent years, deep learning has gained increasing popularity in the fields of Partial Differential Equations (PDEs) and Reduced Order Modeling (ROM), providing domain practitioners with new powerfu...  
URL: https://arxiv.org/abs/2402.00435

**4. Functional SDE approximation inspired by a deep operator network architecture**  
作者: Martin Eigel,Charles Miranda  
摘要: A novel approach to approximate solutions of Stochastic Differential Equations (SDEs) by Deep Neural Networks is derived and analysed. The architecture is inspired by the notion of Deep Operator Netwo...  
URL: https://arxiv.org/abs/2402.03028

**5. Neural Multigrid Architectures**  
作者: Vladimir Fanaskov  
摘要: We propose a convenient matrix-free neural architecture for the multigrid method. The architecture is simple enough to be implemented in less than fifty lines of code, yet it encompasses a large numbe...  
URL: https://arxiv.org/abs/2402.05563

**6. A hybrid iterative method based on MIONet for PDEs: Theory and numerical examples**  
作者: Jun Hu,Pengzhan Jin  
摘要: We propose a hybrid iterative method based on MIONet for PDEs, which combines the traditional numerical iterative solver and the recent powerful machine learning method of neural operator, and further...  
URL: https://arxiv.org/abs/2402.07156

**7. Error Estimation for Physics-informed Neural Networks Approximating Semilinear Wave Equations**  
作者: Beatrice Lorenz,Aras Bacho,Gitta Kutyniok  
摘要: This paper provides rigorous error bounds for physics-informed neural networks approximating the semilinear wave equation. We provide bounds for the generalization and training error in terms of the w...  
URL: https://arxiv.org/abs/2402.07153

**8. Numerical analysis of physics-informed neural networks and related models in physics-informed machine learning**  
作者: Tim De Ryck,Siddhartha Mishra  
摘要: Physics-informed neural networks (PINNs) and their variants have been very popular in recent years as algorithms for the numerical simulation of both forward and inverse problems for partial different...  
URL: https://arxiv.org/abs/2402.10926

**9. Hermite Neural Network Simulation for Solving the 2D Schrodinger Equation**  
作者: Kourosh Parand,Aida Pakniyat  
摘要: The Schrodinger equation is a mathematical equation describing the wave function's behavior in a quantum-mechanical system. It is a partial differential equation that provides valuable insights into t...  
URL: https://arxiv.org/abs/2402.10649

**10. A Predictive Surrogate Model for Heat Transfer of an Impinging Jet on a Concave Surface**  
作者: Sajad Salavatidezfouli,Saeid Rakhsha,Armin Sheidani,Giovanni Stabile,Gianluigi Rozza  
摘要: This paper aims to comprehensively investigate the efficacy of various Model Order Reduction (MOR) and deep learning techniques in predicting heat transfer in a pulsed jet impinging on a concave surfa...  
URL: https://arxiv.org/abs/2402.10641

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## cs.MA (多代理系统)

**1. Learning and Calibrating Heterogeneous Bounded Rational Market Behaviour with Multi-Agent Reinforcement Learning**  
作者: Benjamin Patrick Evans,Sumitra Ganesh  
摘要: Agent-based models (ABMs) have shown promise for modelling various real world phenomena incompatible with traditional equilibrium analysis. However, a critical concern is the manual definition of beha...  
URL: https://arxiv.org/abs/2402.00787

**2. Settling Decentralized Multi-Agent Coordinated Exploration by Novelty Sharing**  
作者: Haobin Jiang,Ziluo Ding,Zongqing Lu  
摘要: Exploration in decentralized cooperative multi-agent reinforcement learning faces two challenges. One is that the novelty of global states is unavailable, while the novelty of local observations is bi...  
URL: https://arxiv.org/abs/2402.02097

**3. A Survey on Context-Aware Multi-Agent Systems: Techniques, Challenges and Future Directions**  
作者: Hung Du,Srikanth Thudumu,Rajesh Vasa,Kon Mouzakis  
摘要: Research interest in autonomous agents is on the rise as an emerging topic. The notable achievements of Large Language Models (LLMs) have demonstrated the considerable potential to attain human-like i...  
URL: https://arxiv.org/abs/2402.01968

**4. LLM Multi-Agent Systems: Challenges and Open Problems**  
作者: Shanshan Han,Qifan Zhang,Yuhang Yao,Weizhao Jin,Zhaozhuo Xu,Chaoyang He  
摘要: This paper explores existing works of multi-agent systems and identifies challenges that remain inadequately addressed. By leveraging the diverse capabilities and roles of individual agents within a m...  
URL: https://arxiv.org/abs/2402.03578

**5. Cooperative Learning with Gaussian Processes for Euler-Lagrange Systems Tracking Control under Switching Topologies**  
作者: Zewen Yang,Songbo Dong,Armin Lederer,Xiaobing Dai,Siyu Chen,Stefan Sosnowski,Georges Hattab,Sandra Hirche  
摘要: This work presents an innovative learning-based approach to tackle the tracking control problem of Euler-Lagrange multi-agent systems with partially unknown dynamics operating under switching communic...  
URL: https://arxiv.org/abs/2402.03048

**6. Joint Intrinsic Motivation for Coordinated Exploration in Multi-Agent Deep Reinforcement Learning**  
作者: Maxime Toquebiau,Nicolas Bredeche,Faïz Benamar,Jae-Yun Jun  
摘要: Multi-agent deep reinforcement learning (MADRL) problems often encounter the challenge of sparse rewards. This challenge becomes even more pronounced when coordination among agents is necessary. As pe...  
URL: https://arxiv.org/abs/2402.03972

**7. CityFlowER: An Efficient and Realistic Traffic Simulator with Embedded Machine Learning Models**  
作者: Longchao Da,Chen Chu,Weinan Zhang,Hua Wei  
摘要: Traffic simulation is an essential tool for transportation infrastructure planning, intelligent traffic control policy learning, and traffic flow analysis. Its effectiveness relies heavily on the real...  
URL: https://arxiv.org/abs/2402.06127

**8. Offline Risk-sensitive RL with Partial Observability to Enhance Performance in Human-Robot Teaming**  
作者: Giorgio Angelotti,Caroline P. C. Chanel,Adam H. M. Pinto,Christophe Lounis,Corentin Chauffaut,Nicolas Drougard  
摘要: The integration of physiological computing into mixed-initiative human-robot interaction systems offers valuable advantages in autonomous task allocation by incorporating real-time features as human s...  
URL: https://arxiv.org/abs/2402.05703

**9. Mixed Q-Functionals: Advancing Value-Based Methods in Cooperative MARL with Continuous Action Domains**  
作者: Yasin Findik,S. Reza Ahmadzadeh  
摘要: Tackling multi-agent learning problems efficiently is a challenging task in continuous action domains. While value-based algorithms excel in sample efficiency when applied to discrete action domains, ...  
URL: https://arxiv.org/abs/2402.07752

**10. Discovering Sensorimotor Agency in Cellular Automata using Diversity Search**  
作者: Gautier Hamon,Mayalen Etcheverry,Bert Wang-Chak Chan,Clément Moulin-Frier,Pierre-Yves Oudeyer  
摘要: The research field of Artificial Life studies how life-like phenomena such as autopoiesis, agency, or self-regulation can self-organize in computer simulations. In cellular automata (CA), a key open-q...  
URL: https://arxiv.org/abs/2402.10236

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## quant-ph (量子物理学)

**1. Hybrid Quantum Vision Transformers for Event Classification in High Energy Physics**  
作者: Eyup B. Unlu,Marçal Comajoan Cara,Gopal Ramesh Dahale,Zhongtian Dong,Roy T. Forestano,Sergei Gleyzer,Daniel Justice,Kyoungchul Kong,Tom Magorsch,Konstantin T. Matchev,Katia Matcheva  
摘要: Models based on vision transformer architectures are considered state-of-the-art when it comes to image classification tasks. However, they require extensive computational resources both for training ...  
URL: https://arxiv.org/abs/2402.00776

**2. Coherent Feed Forward Quantum Neural Network**  
作者: Utkarsh Singh,Aaron Z. Goldberg,Khabat Heshami  
摘要: Quantum machine learning, focusing on quantum neural networks (QNNs), remains a vastly uncharted field of study. Current QNN models primarily employ variational circuits on an ansatz or a quantum feat...  
URL: https://arxiv.org/abs/2402.00653

**3. Adversarial Quantum Machine Learning: An Information-Theoretic Generalization Analysis**  
作者: Petros Georgiou,Sharu Theresa Jose,Osvaldo Simeone  
摘要: In a manner analogous to their classical counterparts, quantum classifiers are vulnerable to adversarial attacks that perturb their inputs. A promising countermeasure is to train the quantum classifie...  
URL: https://arxiv.org/abs/2402.00176

**4. Variational Quantum Circuits Enhanced Generative Adversarial Network**  
作者: Runqiu Shu,Xusheng Xu,Man-Hong Yung,Wei Cui  
摘要: Generative adversarial network (GAN) is one of the widely-adopted machine-learning frameworks for a wide range of applications such as generating high-quality images, video, and audio contents. Howeve...  
URL: https://arxiv.org/abs/2402.01791

**5. Big data applications on small quantum computers**  
作者: Boniface Yogendran,Daniel Charlton,Miriam Beddig,Ioannis Kolotouros,Petros Wallden  
摘要: Current quantum hardware prohibits any direct use of large classical datasets. Coresets allow for a succinct description of these large datasets and their solution in a computational task is competiti...  
URL: https://arxiv.org/abs/2402.01529

**6. Curriculum reinforcement learning for quantum architecture search under hardware errors**  
作者: Yash J. Patel,Akash Kundu,Mateusz Ostaszewski,Xavier Bonet-Monroig,Vedran Dunjko,Onur Danaci  
摘要: The key challenge in the noisy intermediate-scale quantum era is finding useful circuits compatible with current device limitations. Variational quantum algorithms (VQAs) offer a potential solution by...  
URL: https://arxiv.org/abs/2402.03500

**7. Unleashing the Expressive Power of Pulse-Based Quantum Neural Networks**  
作者: Han-Xiao Tao,Jiaqi Hu,Re-Bing Wu  
摘要: Quantum machine learning (QML) based on Noisy Intermediate-Scale Quantum (NISQ) devices hinges on the optimal utilization of limited quantum resources. While gate-based QML models are user-friendly fo...  
URL: https://arxiv.org/abs/2402.02880

**8. Quantum Normalizing Flows for Anomaly Detection**  
作者: Bodo Rosenhahn,Christoph Hirche  
摘要: A Normalizing Flow computes a bijective mapping from an arbitrary distribution to a predefined (e.g. normal) distribution. Such a flow can be used to address different tasks, e.g. anomaly detection, o...  
URL: https://arxiv.org/abs/2402.02866

**9. Geometric quantum machine learning of BQP$^A$ protocols and latent graph classifiers**  
作者: Chukwudubem Umeano,Vincent E. Elfving,Oleksandr Kyriienko  
摘要: Geometric quantum machine learning (GQML) aims to embed problem symmetries for learning efficient solving protocols. However, the question remains if (G)QML can be routinely used for constructing prot...  
URL: https://arxiv.org/abs/2402.03871

**10. Barycentric and Pairwise Renyi Quantum Leakage**  
作者: Farhad Farokhi  
摘要: Barycentric and pairwise quantum Renyi leakages are proposed as two measures of information leakage for privacy and security analysis in quantum computing and communication systems. These quantities b...  
URL: https://arxiv.org/abs/2402.06156

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## cs.HC (人机交互)

**1. To Search or To Gen? Exploring the Synergy between Generative AI and Web Search in Programming**  
作者: Ryan Yen,Nicole Sultanum,Jian Zhao  
摘要: The convergence of generative AI and web search is reshaping problem-solving for programmers. However, the lack of understanding regarding their interplay in the information-seeking process often lead...  
URL: https://arxiv.org/abs/2402.00764

**2. Are Generative AI systems Capable of Supporting Information Needs of Patients?**  
作者: Shreya Rajagopal,Subhashis Hazarika,Sookyung Kim,Yan-ming Chiou,Jae Ho Sohn,Hari Subramonyam,Shiwali Mohan  
摘要: Patients managing a complex illness such as cancer face a complex information challenge where they not only must learn about their illness but also how to manage it. Close interaction with healthcare ...  
URL: https://arxiv.org/abs/2402.00234

**3. Vi(E)va LLM! A Conceptual Stack for Evaluating and Interpreting Generative AI-based Visualizations**  
作者: Luca Podo,Muhammad Ishmal,Marco Angelini  
摘要: The automatic generation of visualizations is an old task that, through the years, has shown more and more interest from the research and practitioner communities. Recently, large language models (LLM...  
URL: https://arxiv.org/abs/2402.02167

**4. User Intent Recognition and Satisfaction with Large Language Models: A User Study with ChatGPT**  
作者: Anna Bodonhelyi,Efe Bozkir,Shuo Yang,Enkelejda Kasneci,Gjergji Kasneci  
摘要: The rapid evolution of LLMs represents an impactful paradigm shift in digital interaction and content engagement. While they encode vast amounts of human-generated knowledge and excel in processing di...  
URL: https://arxiv.org/abs/2402.02136

**5. Human-Centered Privacy Research in the Age of Large Language Models**  
作者: Tianshi Li,Sauvik Das,Hao-Ping Lee,Dakuo Wang,Bingsheng Yao,Zhiping Zhang  
摘要: The emergence of large language models (LLMs), and their increased use in user-facing systems, has led to substantial privacy concerns. To date, research on these privacy concerns has been model-cente...  
URL: https://arxiv.org/abs/2402.01994

**6. Mathemyths: Leveraging Large Language Models to Teach Mathematical Language through Child-AI Co-Creative Storytelling**  
作者: Chao Zhang,Xuechen Liu,Katherine Ziska,Soobin Jeon,Chi-Lin Yu,Ying Xu  
摘要: Mathematical language is a cornerstone of a child's mathematical development, and children can effectively acquire this language through storytelling with a knowledgeable and engaging partner. In this...  
URL: https://arxiv.org/abs/2402.01927

**7. Mobile Fitting Room: On-device Virtual Try-on via Diffusion Models**  
作者: Justin Blalock,David Munechika,Harsha Karanth,Alec Helbling,Pratham Mehta,Seongmin Lee,Duen Horng Chau  
摘要: The growing digital landscape of fashion e-commerce calls for interactive and user-friendly interfaces for virtually trying on clothes. Traditional try-on methods grapple with challenges in adapting t...  
URL: https://arxiv.org/abs/2402.01877

**8. Homogenization Effects of Large Language Models on Human Creative Ideation**  
作者: Barrett R. Anderson,Jash Hemant Shah,Max Kreminski  
摘要: Large language models (LLMs) are now being used in a wide variety of contexts, including as creativity support tools (CSTs) intended to help their users come up with new ideas. But do LLMs actually su...  
URL: https://arxiv.org/abs/2402.01536

**9. GenLens: A Systematic Evaluation of Visual GenAI Model Outputs**  
作者: Tica Lin,Hanspeter Pfister,Jui-Hsien Wang  
摘要: The rapid development of generative AI (GenAI) models in computer vision necessitates effective evaluation methods to ensure their quality and fairness. Existing tools primarily focus on dataset quali...  
URL: https://arxiv.org/abs/2402.03700

**10. ReviewFlow: Intelligent Scaffolding to Support Academic Peer Reviewing**  
作者: Lu Sun,Aaron Chan,Yun Seo Chang,Steven P. Dow  
摘要: Peer review is a cornerstone of science. Research communities conduct peer reviews to assess contributions and to improve the overall quality of science work. Every year, new community members are rec...  
URL: https://arxiv.org/abs/2402.03530

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## physics.plasm-ph (等离子体物理)

**1. EuroPED-NN: Uncertainty aware surrogate model**  
作者: A. Panera Alvarez,A. Ho,A. Jarvinen,S. Saarelma,S. Wiesen,JET Contributors,the AUG team  
摘要: This work successfully generates an uncertainty-aware surrogate model of the EuroPED plasma pedestal model using the Bayesian neural network with noise contrastive prior (BNN-NCP) technique. This mode...  
URL: https://arxiv.org/abs/2402.00760

**2. Active Disruption Avoidance and Trajectory Design for Tokamak Ramp-downs with Neural Differential Equations and Reinforcement Learning**  
作者: Allen M. Wang,Oswin So,Charles Dawson,Darren T. Garnier,Cristina Rea,Chuchu Fan  
摘要: The tokamak offers a promising path to fusion energy, but plasma disruptions pose a major economic risk, motivating considerable advances in disruption avoidance. This work develops a reinforcement le...  
URL: https://arxiv.org/abs/2402.09387

## cs.DC (分布式、并行和集群计算)

**1. Profiling and Modeling of Power Characteristics of Leadership-Scale HPC System Workloads**  
作者: Ahmad Maroof Karimi,Naw Safrin Sattar,Woong Shin,Feiyi Wang  
摘要: In the exascale era in which application behavior has large power & energy footprints, per-application job-level awareness of such impression is crucial in taking steps towards achieving efficiency go...  
URL: https://arxiv.org/abs/2402.00729

**2. Comparative Study of Large Language Model Architectures on Frontier**  
作者: Junqi Yin,Avishek Bose,Guojing Cong,Isaac Lyngaas,Quentin Anthony  
摘要: Large language models (LLMs) have garnered significant attention in both the AI community and beyond. Among these, the Generative Pre-trained Transformer (GPT) has emerged as the dominant architecture...  
URL: https://arxiv.org/abs/2402.00691

**3. Reconfigurable Intelligent Computational Surfaces for MEC-Assisted Autonomous Driving Networks**  
作者: Bo Yang,Xueyao Zhang,Zhiwen Yu,Xuelin Cao,Chongwen Huang,George C. Alexandropoulos,Yan Zhang,Merouane Debbah,Chau Yuen  
摘要: In this paper, we focus on improving autonomous driving safety via task offloading from cellular vehicles (CVs), using vehicle-to-infrastructure (V2I) links, to an multi-access edge computing (MEC) se...  
URL: https://arxiv.org/abs/2402.00398

**4. FedCore: Straggler-Free Federated Learning with Distributed Coresets**  
作者: Hongpeng Guo,Haotian Gu,Xiaoyang Wang,Bo Chen,Eun Kyung Lee,Tamar Eilam,Deming Chen,Klara Nahrstedt  
摘要: Federated learning (FL) is a machine learning paradigm that allows multiple clients to collaboratively train a shared model while keeping their data on-premise. However, the straggler issue, due to sl...  
URL: https://arxiv.org/abs/2402.00219

**5. Exploring the Design Space for Message-Driven Systems for Dynamic Graph Processing using CCA**  
作者: Bibrak Qamar Chandio,Maciej Brodowicz,Thomas Sterling  
摘要: Computer systems that have been successfully deployed for dense regular workloads fall short of achieving scalability and efficiency when applied to irregular and dynamic graph applications. Conventio...  
URL: https://arxiv.org/abs/2402.02576

**6. Device Scheduling and Assignment in Hierarchical Federated Learning for Internet of Things**  
作者: Tinghao Zhang,Kwok-Yan Lam,Jun Zhao  
摘要: Federated Learning (FL) is a promising machine learning approach for Internet of Things (IoT), but it has to address network congestion problems when the population of IoT devices grows. Hierarchical ...  
URL: https://arxiv.org/abs/2402.02506

**7. Towards a Scalable In Situ Fast Fourier Transform**  
作者: Sudhanshu Kulkarni,Burlen Loring,E. Wes Bethel  
摘要: The Fast Fourier Transform (FFT) is a numerical operation that transforms a function into a form comprised of its constituent frequencies and is an integral part of scientific computation and data ana...  
URL: https://arxiv.org/abs/2402.01843

**8. ARGO: An Auto-Tuning Runtime System for Scalable GNN Training on Multi-Core Processor**  
作者: Yi-Chien Lin,Yuyang Chen,Sameh Gobriel,Nilesh Jain,Gopi Krishna Jha,Viktor Prasanna  
摘要: As Graph Neural Networks (GNNs) become popular, libraries like PyTorch-Geometric (PyG) and Deep Graph Library (DGL) are proposed; these libraries have emerged as the de facto standard for implementing...  
URL: https://arxiv.org/abs/2402.03671

**9. Design and Implementation of an Automated Disaster-recovery System for a Kubernetes Cluster Using LSTM**  
作者: Ji-Beom Kim,Je-Bum Choi,Eun-Sung Jung  
摘要: With the increasing importance of data in the modern business environment, effective data man-agement and protection strategies are gaining increasing research attention. Data protection in a cloud en...  
URL: https://arxiv.org/abs/2402.02938

**10. Edge-Parallel Graph Encoder Embedding**  
作者: Ariel Lubonja,Cencheng Shen,Carey Priebe,Randal Burns  
摘要: New algorithms for embedding graphs have reduced the asymptotic complexity of finding low-dimensional representations. One-Hot Graph Encoder Embedding (GEE) uses a single, linear pass over edges and p...  
URL: https://arxiv.org/abs/2402.04403

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## stat.CO (计算)

**1. Quantum-Assisted Hilbert-Space Gaussian Process Regression**  
作者: Ahmad Farooq,Cristian A. Galvis-Florez,Simo Särkkä  
摘要: Gaussian processes are probabilistic models that are commonly used as functional priors in machine learning. Due to their probabilistic nature, they can be used to capture the prior information on the...  
URL: https://arxiv.org/abs/2402.00544

**2. Goodness-of-Fit and Clustering of Spherical Data: the QuadratiK package in R and Python**  
作者: Giovanni Saraceno,Marianthi Markatou,Raktim Mukhopadhyay,Mojgan Golzy  
摘要: We introduce the QuadratiK package that incorporates innovative data analysis methodologies. The presented software, implemented in both R and Python, offers a comprehensive set of goodness-of-fit tes...  
URL: https://arxiv.org/abs/2402.02290

**3. Mixture-Models: a one-stop Python Library for Model-based Clustering using various Mixture Models**  
作者: Siva Rajesh Kasa,Hu Yijie,Santhosh Kumar Kasa,Vaibhav Rajan  
摘要: \texttt{Mixture-Models} is an open-source Python library for fitting Gaussian Mixture Models (GMM) and their variants, such as Parsimonious GMMs, Mixture of Factor Analyzers, MClust models, Mixture of...  
URL: https://arxiv.org/abs/2402.10229

## q-fin.PM (投资组合管理)

**1. Developing A Multi-Agent and Self-Adaptive Framework with Deep Reinforcement Learning for Dynamic Portfolio Risk Management**  
作者: Zhenglong Li,Vincent Tam,Kwan L. Yeung  
摘要: Deep or reinforcement learning (RL) approaches have been adapted as reactive agents to quickly learn and respond with new investment strategies for portfolio management under the highly turbulent fina...  
URL: https://arxiv.org/abs/2402.00515

**2. Combining Transformer based Deep Reinforcement Learning with Black-Litterman Model for Portfolio Optimization**  
作者: Ruoyu Sun,Angelos Stefanidis,Zhengyong Jiang,Jionglong Su  
摘要: As a model-free algorithm, deep reinforcement learning (DRL) agent learns and makes decisions by interacting with the environment in an unsupervised way. In recent years, DRL algorithms have been wide...  
URL: https://arxiv.org/abs/2402.16609

## cs.DL (数字图书馆)

**1. HERITRACE: Tracing Evolution and Bridging Data for Streamlined Curatorial Work in the GLAM Domain**  
作者: Arcangelo Massari,Silvio Peroni  
摘要: HERITRACE is a semantic data management system tailored for the GLAM sector. It is engineered to streamline data curation for non-technical users while also offering an efficient administrative interf...  
URL: https://arxiv.org/abs/2402.00477

**2. What About the Data? A Mapping Study on Data Engineering for AI Systems**  
作者: Petra Heck  
摘要: AI systems cannot exist without data. Now that AI models (data science and AI) have matured and are readily available to apply in practice, most organizations struggle with the data infrastructure to ...  
URL: https://arxiv.org/abs/2402.05156

**3. Hierarchical Tree-structured Knowledge Graph For Academic Insight Survey**  
作者: Jinghong Li,Huy Phan,Wen Gu,Koichi Ota,Shinobu Hasegawa  
摘要: Research surveys have always posed a challenge for beginner researchers who lack of research training. These researchers struggle to understand the directions within their research topic, and the disc...  
URL: https://arxiv.org/abs/2402.04854

**4. Forecasting high-impact research topics via machine learning on evolving knowledge graphs**  
作者: Xuemei Gu,Mario Krenn  
摘要: The exponential growth in scientific publications poses a severe challenge for human researchers. It forces attention to more narrow sub-fields, which makes it challenging to discover new impactful re...  
URL: https://arxiv.org/abs/2402.08640

**5. Towards Development of Automated Knowledge Maps and Databases for Materials Engineering using Large Language Models**  
作者: Deepak Prasad,Mayur Pimpude,Alankar Alankar  
摘要: In this work a Large Language Model (LLM) based workflow is presented that utilizes OpenAI ChatGPT model GPT-3.5-turbo-1106 and Google Gemini Pro model to create summary of text, data and images from ...  
URL: https://arxiv.org/abs/2402.11323

**6. A Literature Review of Literature Reviews in Pattern Analysis and Machine Intelligence**  
作者: Penghai Zhao,Xin Zhang,Jiayue Cao,Ming-Ming Cheng,Jian Yang,Xiang Li  
摘要: The rapid advancements in Pattern Analysis and Machine Intelligence (PAMI) have led to an overwhelming expansion of scientific knowledge, spawning numerous literature reviews aimed at collecting and s...  
URL: https://arxiv.org/abs/2402.12928

**7. Scientific Impact of novel Instrumentation: the Case of MUSE**  
作者: Martin M. Roth  
摘要: In the process of transforming science cases into a viable and affordable design for a novel instrument, there is the problem of how to gauge their scientific impact, especially when they end up in co...  
URL: https://arxiv.org/abs/2402.13540

**8. OAG-Bench: A Human-Curated Benchmark for Academic Graph Mining**  
作者: Fanjin Zhang,Shijie Shi,Yifan Zhu,Bo Chen,Yukuo Cen,Jifan Yu,Yelin Chen,Lulu Wang,Qingfei Zhao,Yuqing Cheng,Tianyi Han,Yuwei An,Dan Zhang,Weng Lam Tam,Kun Cao,Yunhe Pang,Xinyu Guan,Huihui Yuan,Jian Song,Xiaoyan Li,Yuxiao Dong,Jie Tang  
摘要: With the rapid proliferation of scientific literature, versatile academic knowledge services increasingly rely on comprehensive academic graph mining. Despite the availability of public academic graph...  
URL: https://arxiv.org/abs/2402.15810

**9. Displacing Science**  
作者: Linzhuo Li,Yiling Lin,Lingfei Wu  
摘要: Recent research on the decline in the paper disruption index (D-index) has sparked heated debates among scholars and garnered significant attention from policymakers and research institution leaders g...  
URL: https://arxiv.org/abs/2402.16839

## cs.NE (神经和进化计算)

**1. Parallel Spiking Unit for Efficient Training of Spiking Neural Networks**  
作者: Yang Li,Yinqian Sun,Xiang He,Yiting Dong,Dongcheng Zhao,Yi Zeng  
摘要: Efficient parallel computing has become a pivotal element in advancing artificial intelligence. Yet, the deployment of Spiking Neural Networks (SNNs) in this domain is hampered by their inherent seque...  
URL: https://arxiv.org/abs/2402.00449

**2. LM-HT SNN: Enhancing the Performance of SNN to ANN Counterpart through Learnable Multi-hierarchical Threshold Model**  
作者: Zecheng Hao,Xinyu Shi,Yujia Liu,Zhaofei Yu,Tiejun Huang  
摘要: Compared to traditional Artificial Neural Network (ANN), Spiking Neural Network (SNN) has garnered widespread academic interest for its intrinsic ability to transmit information in a more energy-effic...  
URL: https://arxiv.org/abs/2402.00411

**3. Improving Critical Node Detection Using Neural Network-based Initialization in a Genetic Algorithm**  
作者: Chanjuan Liu,Shike Ge,Zhihan Chen,Wenbin Pei,Enqiang Zhu,Yi Mei,Hisao Ishibuchi  
摘要: The Critical Node Problem (CNP) is concerned with identifying the critical nodes in a complex network. These nodes play a significant role in maintaining the connectivity of the network, and removing ...  
URL: https://arxiv.org/abs/2402.00404

**4. Deep Neural Networks: A Formulation Via Non-Archimedean Analysis**  
作者: W. A. Zúñiga-Galindo  
摘要: We introduce a new class of deep neural networks (DNNs) with multilayered tree-like architectures. The architectures are codified using numbers from the ring of integers of non-Archimdean local fields...  
URL: https://arxiv.org/abs/2402.00094

**5. SCAPE: Searching Conceptual Architecture Prompts using Evolution**  
作者: Soo Ling Lim,Peter J Bentley,Fuyuki Ishikawa  
摘要: Conceptual architecture involves a highly creative exploration of novel ideas, often taken from other disciplines as architects consider radical new forms, materials, textures and colors for buildings...  
URL: https://arxiv.org/abs/2402.00089

**6. EvoMerge: Neuroevolution for Large Language Models**  
作者: Yushu Jiang  
摘要: Extensive fine-tuning on Large Language Models does not always yield better results. Oftentimes, models tend to get better at imitating one form of data without gaining greater reasoning ability and m...  
URL: https://arxiv.org/abs/2402.00070

**7. Design and Implementation of Hardware Accelerators for Neural Processing Applications**  
作者: Shilpa Mayannavar,Uday Wali  
摘要: Primary motivation for this work was the need to implement hardware accelerators for a newly proposed ANN structure called Auto Resonance Network (ARN) for robotic motion planning. ARN is an approxima...  
URL: https://arxiv.org/abs/2402.00051

**8. Evolution-Bootstrapped Simulation: Artificial or Human Intelligence: Which Came First?**  
作者: Paul Alexander Bilokon  
摘要: Humans have created artificial intelligence (AI), not the other way around. This statement is deceptively obvious. In this note, we decided to challenge this statement as a small, lighthearted Gedanke...  
URL: https://arxiv.org/abs/2402.00030

**9. Benchmarking Spiking Neural Network Learning Methods with Varying Locality**  
作者: Jiaqi Lin,Sen Lu,Malyaban Bal,Abhronil Sengupta  
摘要: Spiking Neural Networks (SNNs), providing more realistic neuronal dynamics, have shown to achieve performance comparable to Artificial Neural Networks (ANNs) in several machine learning tasks. Informa...  
URL: https://arxiv.org/abs/2402.01782

**10. Efficient and Effective Time-Series Forecasting with Spiking Neural Networks**  
作者: Changze Lv,Yansen Wang,Dongqi Han,Xiaoqing Zheng,Xuanjing Huang,Dongsheng Li  
摘要: Spiking neural networks (SNNs), inspired by the spiking behavior of biological neurons, provide a unique pathway for capturing the intricacies of temporal data. However, applying SNNs to time-series f...  
URL: https://arxiv.org/abs/2402.01533

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## cs.AR (硬件架构)

**1. ONE-SA: Enabling Nonlinear Operations in Systolic Arrays for Efficient and Flexible Neural Network Inference**  
作者: Ruiqi Sun,Yinchen Ni,Xin He,Jie Zhao,An Zou  
摘要: The computation and memory-intensive nature of DNNs limits their use in many mobile and embedded contexts. Application-specific integrated circuit (ASIC) hardware accelerators employ matrix multiplica...  
URL: https://arxiv.org/abs/2402.00395

**2. AssertLLM: Generating and Evaluating Hardware Verification Assertions from Design Specifications via Multi-LLMs**  
作者: Wenji Fang,Mengming Li,Min Li,Zhiyuan Yan,Shang Liu,Zhiyao Xie,Hongce Zhang  
摘要: Assertion-based verification (ABV) is a critical method for ensuring design circuits comply with their architectural specifications, which are typically described in natural language. This process oft...  
URL: https://arxiv.org/abs/2402.00386

**3. Using the Abstract Computer Architecture Description Language to Model AI Hardware Accelerators**  
作者: Mika Markus Müller,Alexander Richard Manfred Borst,Konstantin Lübeck,Alexander Louis-Ferdinand Jung,Oliver Bringmann  
摘要: Artificial Intelligence (AI) has witnessed remarkable growth, particularly through the proliferation of Deep Neural Networks (DNNs). These powerful models drive technological advancements across vario...  
URL: https://arxiv.org/abs/2402.00069

**4. A Comparative Analysis of Microrings Based Incoherent Photonic GEMM Accelerators**  
作者: Sairam Sri Vatsavai,Venkata Sai Praneeth Karempudi,Oluwaseun Adewunmi Alo,Ishan Thakkar  
摘要: Several microring resonator (MRR) based analog photonic architectures have been proposed to accelerate general matrix-matrix multiplications (GEMMs) in deep neural networks with exceptional throughput...  
URL: https://arxiv.org/abs/2402.03149

**5. Embedding Hardware Approximations in Discrete Genetic-based Training for Printed MLPs**  
作者: Florentia Afentaki,Michael Hefenbrock,Georgios Zervakis,Mehdi B. Tahoori  
摘要: Printed Electronics (PE) stands out as a promisingtechnology for widespread computing due to its distinct attributes, such as low costs and flexible manufacturing. Unlike traditional silicon-based tec...  
URL: https://arxiv.org/abs/2402.02930

**6. ARMAN: A Reconfigurable Monolithic 3D Accelerator Architecture for Convolutional Neural Networks**  
作者: Ali Sedaghatgoo,Amir M. Hajisadeghi,Mahmoud Momtazpour,Nader Bagherzadeh  
摘要: The Convolutional Neural Network (CNN) has emerged as a powerful and versatile tool for artificial intelligence (AI) applications. Conventional computing architectures face challenges in meeting the d...  
URL: https://arxiv.org/abs/2402.04431

**7. Algorithm-hardware co-design for Energy-Efficient A/D conversion in ReRAM-based accelerators**  
作者: Chenguang Zhang,Zhihang Yuan,Xingchen Li,Guangyu Sun  
摘要: Deep neural networks are widely deployed in many fields. Due to the in-situ computation (known as processing in memory) capacity of the Resistive Random Access Memory (ReRAM) crossbar, ReRAM-based acc...  
URL: https://arxiv.org/abs/2402.06164

**8. PULSE: Parametric Hardware Units for Low-power Sparsity-Aware Convolution Engine**  
作者: Ilkin Aliyev,Tosiron Adegbija  
摘要: Spiking Neural Networks (SNNs) have become popular for their more bio-realistic behavior than Artificial Neural Networks (ANNs). However, effectively leveraging the intrinsic, unstructured sparsity of...  
URL: https://arxiv.org/abs/2402.06210

**9. IR-Aware ECO Timing Optimization Using Reinforcement Learning**  
作者: Wenjing Jiang,Vidya A. Chhabria,Sachin S. Sapatnekar  
摘要: Engineering change orders (ECOs) in late stages make minimal design fixes to recover from timing shifts due to excessive IR drops. This paper integrates IR-drop-aware timing analysis and ECO timing op...  
URL: https://arxiv.org/abs/2402.07781

**10. A Precision-Optimized Fixed-Point Near-Memory Digital Processing Unit for Analog In-Memory Computing**  
作者: Elena Ferro,Athanasios Vasilopoulos,Corey Lammie,Manuel Le Gallo,Luca Benini,Irem Boybat,Abu Sebastian  
摘要: Analog In-Memory Computing (AIMC) is an emerging technology for fast and energy-efficient Deep Learning (DL) inference. However, a certain amount of digital post-processing is required to deal with ci...  
URL: https://arxiv.org/abs/2402.07549

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## physics.ao-ph (大气和海洋物理)

**1. Climate Trends of Tropical Cyclone Intensity and Energy Extremes Revealed by Deep Learning**  
作者: Buo-Fu Chen,Boyo Chen,Chun-Min Hsiao,Hsu-Feng Teng,Cheng-Shang Lee,Hung-Chi Kuo  
摘要: Anthropogenic influences have been linked to tropical cyclone (TC) poleward migration, TC extreme precipitation, and an increased proportion of major hurricanes [1, 2, 3, 4]. Understanding past TC tre...  
URL: https://arxiv.org/abs/2402.00362

**2. Ai4Fapar: How artificial intelligence can help to forecast the seasonal earth observation signal**  
作者: Filip Sabo,Martin Claverie,Michele Meroni,Arthur Hrast Essenfelder  
摘要: This paper investigated the potential of a multivariate Transformer model to forecast the temporal trajectory of the Fraction of Absorbed Photosynthetically Active Radiation (FAPAR) for short (1 month...  
URL: https://arxiv.org/abs/2402.06684

**3. Weather Prediction with Diffusion Guided by Realistic Forecast Processes**  
作者: Zhanxiang Hua,Yutong He,Chengqian Ma,Alexandra Anderson-Frey  
摘要: Weather forecasting remains a crucial yet challenging domain, where recently developed models based on deep learning (DL) have approached the performance of traditional numerical weather prediction (N...  
URL: https://arxiv.org/abs/2402.06666

**4. Diffusion Model-based Probabilistic Downscaling for 180-year East Asian Climate Reconstruction**  
作者: Fenghua Ling,Zeyu Lu,Jing-Jia Luo,Lei Bai,Swadhin K. Behera,Dachao Jin,Baoxiang Pan,Huidong Jiang,Toshio Yamagata  
摘要: As our planet is entering into the "global boiling" era, understanding regional climate change becomes imperative. Effective downscaling methods that provide localized insights are crucial for this ta...  
URL: https://arxiv.org/abs/2402.06646

**5. A Deep Learning Approach to Radar-based QPE**  
作者: Ting-Shuo Yo,Shih-Hao Su,Jung-Lien Chu,Chiao-Wei Chang,Hung-Chi Kuo  
摘要: In this study, we propose a volume-to-point framework for quantitative precipitation estimation (QPE) based on the Quantitative Precipitation Estimation and Segregation Using Multiple Sensor (QPESUMS)...  
URL: https://arxiv.org/abs/2402.09846

**6. Global Tropical Cyclone Intensity Forecasting with Multi-modal Multi-scale Causal Autoregressive Model**  
作者: Xinyu Wang,Kang Chen,Lei Liu,Tao Han,Bin Li,Lei Bai  
摘要: Accurate forecasting of Tropical cyclone (TC) intensity is crucial for formulating disaster risk reduction strategies. Current methods predominantly rely on limited spatiotemporal information from ERA...  
URL: https://arxiv.org/abs/2402.13270

**7. Machine-learning prediction of tipping with applications to the Atlantic Meridional Overturning Circulation**  
作者: Shirin Panahi,Ling-Wei Kong,Mohammadamin Moradi,Zheng-Meng Zhai,Bryan Glaz,Mulugeta Haile,Ying-Cheng Lai  
摘要: Anticipating a tipping point, a transition from one stable steady state to another, is a problem of broad relevance due to the ubiquity of the phenomenon in diverse fields. The steady-state nature of ...  
URL: https://arxiv.org/abs/2402.14877

**8. Machine Learning Reveals Large-scale Impact of Posidonia Oceanica on Mediterranean Sea Water**  
作者: Celio Trois,Luciana Didonet Del Fabro,Vladimir A. Baulin  
摘要: Posidonia oceanica is a protected endemic seagrass of Mediterranean sea that fosters biodiversity, stores carbon, releases oxygen, and provides habitat to numerous sea organisms. Leveraging augmented ...  
URL: https://arxiv.org/abs/2402.14459

## q-bio.OT (其他定量生物学)

**1. The whack-a-mole governance challenge for AI-enabled synthetic biology: literature review and emerging frameworks**  
作者: Trond Arne Undheim  
摘要: AI-enabled synthetic biology has tremendous potential but also significantly increases biorisks and brings about a new set of dual use concerns. The picture is complicated given the vast innovations e...  
URL: https://arxiv.org/abs/2402.00312

## physics.geo-ph (地球物理学)

**1. Seismic Traveltime Tomography with Label-free Learning**  
作者: Feng Wang,Bo Yang,Renfang Wang,Hong Qiu  
摘要: Deep learning techniques have been used to build velocity models (VMs) for seismic traveltime tomography and have shown encouraging performance in recent years. However, they need to generate labeled ...  
URL: https://arxiv.org/abs/2402.00310

**2. When Geoscience Meets Generative AI and Large Language Models: Foundations, Trends, and Future Challenges**  
作者: Abdenour Hadid,Tanujit Chakraborty,Daniel Busby  
摘要: Generative Artificial Intelligence (GAI) represents an emerging field that promises the creation of synthetic data and outputs in different modalities. GAI has recently shown impressive results across...  
URL: https://arxiv.org/abs/2402.03349

**3. Controllable seismic velocity synthesis using generative diffusion models**  
作者: Fu Wang,Xinquan Huang,Tariq Alkhalifah  
摘要: Accurate seismic velocity estimations are vital to understanding Earth's subsurface structures, assessing natural resources, and evaluating seismic hazards. Machine learning-based inversion algorithms...  
URL: https://arxiv.org/abs/2402.06277

**4. Data-Driven Dynamic Friction Models based on Recurrent Neural Networks**  
作者: Joaquin Garcia-Suarez  
摘要: In this letter, it is demonstrated that Recurrent Neural Networks (RNNs) based on Gated Recurrent Unit (GRU) architecture, possess the capability to learn the complex dynamics of rate-and-state fricti...  
URL: https://arxiv.org/abs/2402.14148

## math.ST (统计理论)

**1. Information-Theoretic Thresholds for Planted Dense Cycles**  
作者: Cheng Mao,Alexander S. Wein,Shenduo Zhang  
摘要: We study a random graph model for small-world networks which are ubiquitous in social and biological sciences. In this model, a dense cycle of expected bandwidth $n τ$, representing the hidden one-dim...  
URL: https://arxiv.org/abs/2402.00305

**2. The Optimality of Kernel Classifiers in Sobolev Space**  
作者: Jianfa Lai,Zhifan Li,Dongming Huang,Qian Lin  
摘要: Kernel methods are widely used in machine learning, especially for classification problems. However, the theoretical analysis of kernel classification is still limited. This paper investigates the sta...  
URL: https://arxiv.org/abs/2402.01148

**3. The Limits of Assumption-free Tests for Algorithm Performance**  
作者: Yuetian Luo,Rina Foygel Barber  
摘要: Algorithm evaluation and comparison are fundamental questions in machine learning and statistics -- how well does an algorithm perform at a given modeling task, and which algorithm performs best? Many...  
URL: https://arxiv.org/abs/2402.07388

**4. Sampling from the Mean-Field Stationary Distribution**  
作者: Yunbum Kook,Matthew S. Zhang,Sinho Chewi,Murat A. Erdogdu,Mufan Bill Li  
摘要: We study the complexity of sampling from the stationary distribution of a mean-field SDE, or equivalently, the complexity of minimizing a functional over the space of probability measures which includ...  
URL: https://arxiv.org/abs/2402.07355

**5. Oja's Algorithm for Streaming Sparse PCA**  
作者: Syamantak Kumar,Purnamrita Sarkar  
摘要: Oja's algorithm for Streaming Principal Component Analysis (PCA) for $n$ data-points in a $d$ dimensional space achieves the same sin-squared error $O(r\_{\mathsf{eff}}/n)$ as the offline algorithm in ...  
URL: https://arxiv.org/abs/2402.07240

**6. Online Differentially Private Synthetic Data Generation**  
作者: Yiyun He,Roman Vershynin,Yizhe Zhu  
摘要: We present a polynomial-time algorithm for online differentially private synthetic data generation. For a data stream within the hypercube $[0,1]^d$ and an infinite time horizon, we develop an online ...  
URL: https://arxiv.org/abs/2402.08012

**7. Computationally efficient reductions between some statistical models**  
作者: Mengqi Lou,Guy Bresler,Ashwin Pananjady  
摘要: We study the problem of approximately transforming a sample from a source statistical model to a sample from a target statistical model without knowing the parameters of the source model, and construc...  
URL: https://arxiv.org/abs/2402.07717

**8. Global optimality under amenable symmetry constraints**  
作者: Peter Orbanz  
摘要: Consider a convex function that is invariant under an group of transformations. If it has a minimizer, does it also have an invariant minimizer? Variants of this problem appear in nonparametric statis...  
URL: https://arxiv.org/abs/2402.07613

**9. Distribution Estimation under the Infinity Norm**  
作者: Aryeh Kontorovich,Amichai Painsky  
摘要: We present novel bounds for estimating discrete probability distributions under the $\ell\_\infty$ norm. These are nearly optimal in various precise senses, including a kind of instance-optimality. Our...  
URL: https://arxiv.org/abs/2402.08422

**10. Efficient Sampling on Riemannian Manifolds via Langevin MCMC**  
作者: Xiang Cheng,Jingzhao Zhang,Suvrit Sra  
摘要: We study the task of efficiently sampling from a Gibbs distribution $d π^\* = e^{-h} d {vol}\_g$ over a Riemannian manifold $M$ via (geometric) Langevin MCMC; this algorithm involves computing exponenti...  
URL: https://arxiv.org/abs/2402.10357

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## q-fin.GN (一般财务)

**1. Attention-based Dynamic Multilayer Graph Neural Networks for Loan Default Prediction**  
作者: Sahab Zandi,Kamesh Korangi,María Óskarsdóttir,Christophe Mues,Cristián Bravo  
摘要: Whereas traditional credit scoring tends to employ only individual borrower- or loan-level predictors, it has been acknowledged for some time that connections between borrowers may result in default r...  
URL: https://arxiv.org/abs/2402.00299

## cs.DB (数据库)

**1. Effective Bug Detection in Graph Database Engines: An LLM-based Approach**  
作者: Jiayi Wu,Zhengyu Wu,Ronghua Li,Hongchao Qin,Guoren Wang  
摘要: Graph database engines play a pivotal role in efficiently storing and managing graph data across various domains, including bioinformatics, knowledge graphs, and recommender systems. Ensuring data acc...  
URL: https://arxiv.org/abs/2402.00292

**2. LLM-Enhanced Data Management**  
作者: Xuanhe Zhou,Xinyang Zhao,Guoliang Li  
摘要: Machine learning (ML) techniques for optimizing data management problems have been extensively studied and widely deployed in recent five years. However traditional ML methods have limitations on gene...  
URL: https://arxiv.org/abs/2402.02643

**3. When Large Language Models Meet Vector Databases: A Survey**  
作者: Zhi Jing,Yongye Su,Yikun Han  
摘要: This survey explores the synergistic potential of Large Language Models (LLMs) and Vector Databases (VecDBs), a burgeoning but rapidly evolving research area. With the proliferation of LLMs comes a ho...  
URL: https://arxiv.org/abs/2402.01763

**4. Towards a Flexible Scale-out Framework for Efficient Visual Data Query Processing**  
作者: Rohit Verma,Arun Raghunath  
摘要: There is growing interest in visual data management systems that support queries with specialized operations ranging from resizing an image to running complex machine learning models. With a plethora ...  
URL: https://arxiv.org/abs/2402.03283

**5. Mining a Minimal Set of Behavioral Patterns using Incremental Evaluation**  
作者: Mehdi Acheli,Daniela Grigori,Matthias Weidlich  
摘要: Process mining provides methods to analyse event logs generated by information systems during the execution of processes. It thereby supports the design, validation, and execution of processes in doma...  
URL: https://arxiv.org/abs/2402.02921

**6. Intent-Based Access Control: Using LLMs to Intelligently Manage Access Control**  
作者: Pranav Subramaniam,Sanjay Krishnan  
摘要: In every enterprise database, administrators must define an access control policy that specifies which users have access to which assets. Access control straddles two worlds: policy (organization-leve...  
URL: https://arxiv.org/abs/2402.07332

**7. A harmonized and interoperable format for storing and processing polysomnography data**  
作者: Riku Huttunen,Matias Rusanen,Sami Nikkonen,Henri Korkalainen,Samu Kainulainen  
摘要: Polysomnography (PSG) data is recorded and stored in various formats depending on the recording software. Although the PSG data can usually be exported to open formats, such as the European Data Forma...  
URL: https://arxiv.org/abs/2402.06702

**8. Retrieve, Merge, Predict: Augmenting Tables with Data Lakes**  
作者: Riccardo Cappuzzo,Aimee Coelho,Felix Lefebvre,Paolo Papotti,Gael Varoquaux  
摘要: Machine-learning from a disparate set of tables, a data lake, requires assembling features by merging and aggregating tables. Data discovery can extend autoML to data tables by automating these steps....  
URL: https://arxiv.org/abs/2402.06282

**9. From Shapes to Shapes: Inferring SHACL Shapes for Results of SPARQL CONSTRUCT Queries (Extended Version)**  
作者: Philipp Seifer,Daniel Hernández,Ralf Lämmel,Steffen Staab  
摘要: SPARQL CONSTRUCT queries allow for the specification of data processing pipelines that transform given input graphs into new output graphs. It is now common to constrain graphs through SHACL shapes al...  
URL: https://arxiv.org/abs/2402.08509

**10. Evaluating the Data Model Robustness of Text-to-SQL Systems Based on Real User Queries**  
作者: Jonathan Fürst,Catherine Kosten,Farhad Nooralahzadeh,Yi Zhang,Kurt Stockinger  
摘要: Text-to-SQL systems (also known as NL-to-SQL systems) have become an increasingly popular solution for bridging the gap between user capabilities and SQL-based data access. These systems translate use...  
URL: https://arxiv.org/abs/2402.08349

... 以及其他 6 篇论文

## physics.soc-ph (物理与社会)

**1. Uncover the nature of overlapping community in cities**  
作者: Peng Luo,Di Zhu  
摘要: Urban spaces, though often perceived as discrete communities, are shared by various functional and social groups. Our study introduces a graph-based physics-aware deep learning framework, illuminating...  
URL: https://arxiv.org/abs/2402.00222

**2. Interplay between tie strength and neighbourhood topology in complex networks: Granovetter's theory and beyond**  
作者: Maciej J Mrowinski,Kamil P. Orzechowski,Agata Fronczak,Piotr Fronczak  
摘要: Granovetter's weak ties theory is a very important sociological theory according to which a correlation between edge weight and the network's topology should exist. More specifically, the neighbourhoo...  
URL: https://arxiv.org/abs/2402.02487

**3. Social Physics Informed Diffusion Model for Crowd Simulation**  
作者: Hongyi Chen,Jingtao Ding,Yong Li,Yue Wang,Xiao-Ping Zhang  
摘要: Crowd simulation holds crucial applications in various domains, such as urban planning, architectural design, and traffic arrangement. In recent years, physics-informed machine learning methods have a...  
URL: https://arxiv.org/abs/2402.06680

**4. Can machine learning predict citizen-reported angler behavior?**  
作者: Julia S. Schmid,Sean Simmons,Mark A. Lewis,Mark S. Poesch,Pouria Ramazi  
摘要: Prediction of angler behaviors, such as catch rates and angler pressure, is essential to maintaining fish populations and ensuring angler satisfaction. Angler behavior can partly be tracked by online ...  
URL: https://arxiv.org/abs/2402.06678

**5. Understanding team collapse via probabilistic graphical models**  
作者: Iasonas Nikolaou,Konstantinos Pelechrinis,Evimaria Terzi  
摘要: In this work, we develop a graphical model to capture team dynamics. We analyze the model and show how to learn its parameters from data. Using our model we study the phenomenon of team collapse from ...  
URL: https://arxiv.org/abs/2402.10243

## q-bio.NC (神经元和认知)

**1. Classification of attention performance post-longitudinal tDCS via functional connectivity and machine learning methods**  
作者: Akash K Rao,Vishnu K Menon,Arnav Bhavsar,Shubhajit Roy Chowdhury,Ramsingh Negi,Varun Dutt  
摘要: Attention is the brain's mechanism for selectively processing specific stimuli while filtering out irrelevant information. Characterizing changes in attention following long-term interventions (such a...  
URL: https://arxiv.org/abs/2402.00090

**2. Multi-Region Markovian Gaussian Process: An Efficient Method to Discover Directional Communications Across Multiple Brain Regions**  
作者: Weihan Li,Chengrui Li,Yule Wang,Anqi Wu  
摘要: Studying the complex interactions between different brain regions is crucial in neuroscience. Various statistical methods have explored the latent communication across multiple brain regions. Two main...  
URL: https://arxiv.org/abs/2402.02686

**3. Artificial Intelligence for EEG Prediction: Applied Chaos Theory**  
作者: Vincent Jorgsson  
摘要: In the present research, we delve into the intricate realm of electroencephalogram (EEG) data analysis, focusing on sequence-to-sequence prediction of data across 32 EEG channels. The study harmonious...  
URL: https://arxiv.org/abs/2402.03316

**4. Learning to Abstract Visuomotor Mappings using Meta-Reinforcement Learning**  
作者: Carlos A. Velazquez-Vargas,Isaac Ray Christian,Jordan A. Taylor,Sreejan Kumar  
摘要: We investigated the human capacity to acquire multiple visuomotor mappings for de novo skills. Using a grid navigation paradigm, we tested whether contextual cues implemented as different "grid worlds...  
URL: https://arxiv.org/abs/2402.03072

**5. Association between Prefrontal fNIRS signals during Cognitive tasks and College scholastic ability test (CSAT) scores: Analysis using a quantum annealing approach**  
作者: Yeaju Kim,Junggu Choi,Bora Kim,Yongwan Park,Jihyun Cha,Jongkwan Choi,Sanghoon Han  
摘要: Academic achievement is a critical measure of intellectual ability, prompting extensive research into cognitive tasks as potential predictors. Neuroimaging technologies, such as functional near-infrar...  
URL: https://arxiv.org/abs/2402.04287

**6. FPGA Deployment of LFADS for Real-time Neuroscience Experiments**  
作者: Xiaohan Liu,ChiJui Chen,YanLun Huang,LingChi Yang,Elham E Khoda,Yihui Chen,Scott Hauck,Shih-Chieh Hsu,Bo-Cheng Lai  
摘要: Large-scale recordings of neural activity are providing new opportunities to study neural population dynamics. A powerful method for analyzing such high-dimensional measurements is to deploy an algori...  
URL: https://arxiv.org/abs/2402.04274

**7. A Rational Analysis of the Speech-to-Song Illusion**  
作者: Raja Marjieh,Pol van Rijn,Ilia Sucholutsky,Harin Lee,Thomas L. Griffiths,Nori Jacoby  
摘要: The speech-to-song illusion is a robust psychological phenomenon whereby a spoken sentence sounds increasingly more musical as it is repeated. Despite decades of research, a complete formal account of...  
URL: https://arxiv.org/abs/2402.06992

**8. BrainWave: A Brain Signal Foundation Model for Clinical Applications**  
作者: Zhizhang Yuan,Fanqi Shen,Meng Li,Yuguo Yu,Chenhao Tan,Yang Yang  
摘要: Neural electrical activity is fundamental to brain function, underlying a range of cognitive and behavioral processes, including movement, perception, decision-making, and consciousness. Abnormal patt...  
URL: https://arxiv.org/abs/2402.10251

**9. Clustering Inductive Biases with Unrolled Networks**  
作者: Jonathan Huml,Abiy Tasissa,Demba Ba  
摘要: The classical sparse coding (SC) model represents visual stimuli as a linear combination of a handful of learned basis functions that are Gabor-like when trained on natural image data. However, the Ga...  
URL: https://arxiv.org/abs/2402.10213

**10. Structure of activity in multiregion recurrent neural networks**  
作者: David G. Clark,Manuel Beiran  
摘要: Neural circuits comprise multiple interconnected regions, each with complex dynamics. The interplay between local and global activity is thought to underlie computational flexibility, yet the structur...  
URL: https://arxiv.org/abs/2402.12188

... 以及其他 4 篇论文

## cs.MM (多媒体)

**1. Detecting Multimedia Generated by Large AI Models: A Survey**  
作者: Li Lin,Neeraj Gupta,Yue Zhang,Hainan Ren,Chun-Hao Liu,Feng Ding,Xin Wang,Xin Li,Luisa Verdoliva,Shu Hu  
摘要: The rapid advancement of Large AI Models (LAIMs), particularly diffusion models and large language models, has marked a new era where AI-generated multimedia is increasingly integrated into various as...  
URL: https://arxiv.org/abs/2402.00045

**2. Video Super-Resolution for Optimized Bitrate and Green Online Streaming**  
作者: Vignesh V Menon,Prajit T Rajendran,Amritha Premkumar,Benjamin Bross,Detlev Marpe  
摘要: Conventional per-title encoding schemes strive to optimize encoding resolutions to deliver the utmost perceptual quality for each bitrate ladder representation. Nevertheless, maintaining encoding time...  
URL: https://arxiv.org/abs/2402.03513

**3. BDIQA: A New Dataset for Video Question Answering to Explore Cognitive Reasoning through Theory of Mind**  
作者: Yuanyuan Mao,Xin Lin,Qin Ni,Liang He  
摘要: As a foundational component of cognitive intelligence, theory of mind (ToM) can make AI more closely resemble human thought processes, thereby enhancing their interaction and collaboration with human....  
URL: https://arxiv.org/abs/2402.07402

**4. Synthesizing Sentiment-Controlled Feedback For Multimodal Text and Image Data**  
作者: Puneet Kumar,Sarthak Malik,Balasubramanian Raman,Xiaobai Li  
摘要: The ability to generate sentiment-controlled feedback in response to multimodal inputs comprising text and images addresses a critical gap in human-computer interaction. This capability allows systems...  
URL: https://arxiv.org/abs/2402.07640

**5. LL-GABR: Energy Efficient Live Video Streaming Using Reinforcement Learning**  
作者: Adithya Raman,Bekir Turkkan,Tevfik Kosar  
摘要: Over the recent years, research and development in adaptive bitrate (ABR) algorithms for live video streaming have been successful in improving users' quality of experience (QoE) by reducing latency t...  
URL: https://arxiv.org/abs/2402.09392

**6. Blind Deep-Learning-Based Image Watermarking Robust Against Geometric Transformations**  
作者: Hannes Mareen,Lucas Antchougov,Glenn Van Wallendael,Peter Lambert  
摘要: Digital watermarking enables protection against copyright infringement of images. Although existing methods embed watermarks imperceptibly and demonstrate robustness against attacks, they typically la...  
URL: https://arxiv.org/abs/2402.09062

**7. Generative Cross-Modal Retrieval: Memorizing Images in Multimodal Language Models for Retrieval and Beyond**  
作者: Yongqi Li,Wenjie Wang,Leigang Qu,Liqiang Nie,Wenjie Li,Tat-Seng Chua  
摘要: The recent advancements in generative language models have demonstrated their ability to memorize knowledge from documents and recall knowledge to respond to user queries effectively. Building upon th...  
URL: https://arxiv.org/abs/2402.10805

**8. Investigating the Generalizability of Physiological Characteristics of Anxiety**  
作者: Emily Zhou,Mohammad Soleymani,Maja J. Matarić  
摘要: Recent works have demonstrated the effectiveness of machine learning (ML) techniques in detecting anxiety and stress using physiological signals, but it is unclear whether ML models are learning physi...  
URL: https://arxiv.org/abs/2402.15513

## cs.GR (图形)

**1. Neural Rendering and Its Hardware Acceleration: A Review**  
作者: Xinkai Yan,Jieting Xu,Yuchi Huo,Hujun Bao  
摘要: Neural rendering is a new image and video generation method based on deep learning. It combines the deep learning model with the physical knowledge of computer graphics, to obtain a controllable and r...  
URL: https://arxiv.org/abs/2402.00028

**2. M2fNet: Multi-modal Forest Monitoring Network on Large-scale Virtual Dataset**  
作者: Yawen Lu,Yunhan Huang,Su Sun,Tansi Zhang,Xuewen Zhang,Songlin Fei,Yingjie Chen  
摘要: Forest monitoring and education are key to forest protection, education and management, which is an effective way to measure the progress of a country's forest and climate commitments. Due to the lack...  
URL: https://arxiv.org/abs/2402.04534

**3. Watertightization of Trimmed Surfaces at Intersection Boundary**  
作者: Hua Li,Lu Zhang,Ruoxi Guo,Zushang Xiao,Rui Guo  
摘要: This paper introduces a watertight technique to deal with the boundary representation of surface-surface intersection in CAD. Surfaces play an important role in today's geometric design. The mathemati...  
URL: https://arxiv.org/abs/2402.10216

**4. FlashTex: Fast Relightable Mesh Texturing with LightControlNet**  
作者: Kangle Deng,Timothy Omernick,Alexander Weiss,Deva Ramanan,Jun-Yan Zhu,Tinghui Zhou,Maneesh Agrawala  
摘要: Manually creating textures for 3D meshes is time-consuming, even for expert visual content creators. We propose a fast approach for automatically texturing an input 3D mesh based on a user-provided te...  
URL: https://arxiv.org/abs/2402.13251

**5. Improving Efficiency of Iso-Surface Extraction on Implicit Neural Representations Using Uncertainty Propagation**  
作者: Haoyu Li,Han-Wei Shen  
摘要: Implicit Neural representations (INRs) are widely used for scientific data reduction and visualization by modeling the function that maps a spatial location to a data value. Without any prior knowledg...  
URL: https://arxiv.org/abs/2402.13861

**6. Cinematographic Camera Diffusion Model**  
作者: Hongda Jiang,Xi Wang,Marc Christie,Libin Liu,Baoquan Chen  
摘要: Designing effective camera trajectories in virtual 3D environments is a challenging task even for experienced animators. Despite an elaborate film grammar, forged through years of experience, that ena...  
URL: https://arxiv.org/abs/2402.16143

**7. Non-Euclidean Sliced Optimal Transport Sampling**  
作者: Baptiste Genest,Nicolas Courty,David Coeurjolly  
摘要: In machine learning and computer graphics, a fundamental task is the approximation of a probability density function through a well-dispersed collection of samples. Providing a formal metric for measu...  
URL: https://arxiv.org/abs/2402.16981

## q-bio.BM (生物分子)

**1. Can Large Language Models Understand Molecules?**  
作者: Shaghayegh Sadeghi,Alan Bui,Ali Forooghi,Jianguo Lu,Alioune Ngom  
摘要: Purpose: Large Language Models (LLMs) like GPT (Generative Pre-trained Transformer) from OpenAI and LLaMA (Large Language Model Meta AI) from Meta AI are increasingly recognized for their potential in...  
URL: https://arxiv.org/abs/2402.00024

**2. Hybrid quantum cycle generative adversarial network for small molecule generation**  
作者: Matvei Anoshin,Asel Sagingalieva,Christopher Mansell,Dmitry Zhiganov,Vishal Shete,Markus Pflitsch,Alexey Melnikov  
摘要: The drug design process currently requires considerable time and resources to develop each new compound that enters the market. This work develops an application of hybrid quantum generative models ba...  
URL: https://arxiv.org/abs/2402.00014

**3. Predicting ATP binding sites in protein sequences using Deep Learning and Natural Language Processing**  
作者: Shreyas V,Swati Agarwal  
摘要: Predicting ATP-Protein Binding sites in genes is of great significance in the field of Biology and Medicine. The majority of research in this field has been conducted through time- and resource-intens...  
URL: https://arxiv.org/abs/2402.01829

**4. Effective Protein-Protein Interaction Exploration with PPIretrieval**  
作者: Chenqing Hua,Connor Coley,Guy Wolf,Doina Precup,Shuangjia Zheng  
摘要: Protein-protein interactions (PPIs) are crucial in regulating numerous cellular functions, including signal transduction, transportation, and immune defense. As the accuracy of multi-chain protein com...  
URL: https://arxiv.org/abs/2402.03675

**5. AlphaFold Meets Flow Matching for Generating Protein Ensembles**  
作者: Bowen Jing,Bonnie Berger,Tommi Jaakkola  
摘要: The biological functions of proteins often depend on dynamic structural ensembles. In this work, we develop a flow-based generative modeling approach for learning and sampling the conformational lands...  
URL: https://arxiv.org/abs/2402.04845

**6. Genetic-guided GFlowNets for Sample Efficient Molecular Optimization**  
作者: Hyeonah Kim,Minsu Kim,Sanghyeok Choi,Jinkyoo Park  
摘要: The challenge of discovering new molecules with desired properties is crucial in domains like drug discovery and material design. Recent advances in deep learning-based generative methods have shown p...  
URL: https://arxiv.org/abs/2402.05961

**7. Structure-Informed Protein Language Model**  
作者: Zuobai Zhang,Jiarui Lu,Vijil Chenthamarakshan,Aurélie Lozano,Payel Das,Jian Tang  
摘要: Protein language models are a powerful tool for learning protein representations through pre-training on vast protein sequence datasets. However, traditional protein language models lack explicit stru...  
URL: https://arxiv.org/abs/2402.05856

**8. Dirichlet Flow Matching with Applications to DNA Sequence Design**  
作者: Hannes Stark,Bowen Jing,Chenyu Wang,Gabriele Corso,Bonnie Berger,Regina Barzilay,Tommi Jaakkola  
摘要: Discrete diffusion or flow models could enable faster and more controllable sequence generation than autoregressive models. We show that naïve linear flow matching on the simplex is insufficient towar...  
URL: https://arxiv.org/abs/2402.05841

**9. PSC-CPI: Multi-Scale Protein Sequence-Structure Contrasting for Efficient and Generalizable Compound-Protein Interaction Prediction**  
作者: Lirong Wu,Yufei Huang,Cheng Tan,Zhangyang Gao,Bozhen Hu,Haitao Lin,Zicheng Liu,Stan Z. Li  
摘要: Compound-Protein Interaction (CPI) prediction aims to predict the pattern and strength of compound-protein interactions for rational drug discovery. Existing deep learning-based methods utilize only t...  
URL: https://arxiv.org/abs/2402.08198

**10. ProtIR: Iterative Refinement between Retrievers and Predictors for Protein Function Annotation**  
作者: Zuobai Zhang,Jiarui Lu,Vijil Chenthamarakshan,Aurélie Lozano,Payel Das,Jian Tang  
摘要: Protein function annotation is an important yet challenging task in biology. Recent deep learning advancements show significant potential for accurate function prediction by learning from protein sequ...  
URL: https://arxiv.org/abs/2402.07955

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## stat.ME (方法论)

**1. Estimation of conditional average treatment effects on distributed confidential data**  
作者: Yuji Kawamata,Ryoki Motai,Yukihiko Okada,Akira Imakura,Tetsuya Sakurai  
摘要: Estimation of conditional average treatment effects (CATEs) is an important topic in sciences. CATEs can be estimated with high accuracy if distributed data across multiple parties can be centralized....  
URL: https://arxiv.org/abs/2402.02672

**2. "Clustering and Conquer" Procedures for Parallel Large-Scale Ranking and Selection**  
作者: Zishi Zhang,Yijie Peng  
摘要: This work breaks the sample efficiency bottleneck in parallel large-scale ranking and selection (R&S) problem by leveraging correlation information. We modify the commonly used "divide and conquer" fr...  
URL: https://arxiv.org/abs/2402.02196

**3. kNN Algorithm for Conditional Mean and Variance Estimation with Automated Uncertainty Quantification and Variable Selection**  
作者: Marcos Matabuena,Juan C. Vidal,Oscar Hernan Madrid Padilla,Jukka-Pekka Onnela  
摘要: In this paper, we introduce a kNN-based regression method that synergizes the scalability and adaptability of traditional non-parametric kNN models with a novel variable selection technique. This meth...  
URL: https://arxiv.org/abs/2402.01635

**4. Improved prediction of future user activity in online A/B testing**  
作者: Lorenzo Masoero,Mario Beraha,Thomas Richardson,Stefano Favaro  
摘要: In online randomized experiments or A/B tests, accurate predictions of participant inclusion rates are of paramount importance. These predictions not only guide experimenters in optimizing the experim...  
URL: https://arxiv.org/abs/2402.03231

**5. Peeking with PEAK: Sequential, Nonparametric Composite Hypothesis Tests for Means of Multiple Data Streams**  
作者: Brian Cho,Kyra Gan,Nathan Kallus  
摘要: We propose a novel nonparametric sequential test for composite hypotheses for means of multiple data streams. Our proposed method, \emph{peeking with expectation-based averaged capital} (PEAK), builds...  
URL: https://arxiv.org/abs/2402.06122

**6. Gradient-flow adaptive importance sampling for Bayesian leave one out cross-validation with application to sigmoidal classification models**  
作者: Joshua C Chang,Xiangting Li,Shixin Xu,Hao-Ren Yao,Julia Porcino,Carson Chow  
摘要: We introduce gradient-flow-guided adaptive importance sampling (IS) transformations for stabilizing Monte-Carlo approximations of leave-one-out (LOO) cross-validated predictions for Bayesian models. A...  
URL: https://arxiv.org/abs/2402.08151

**7. Combining Evidence Across Filtrations**  
作者: Yo Joong Choe,Aaditya Ramdas  
摘要: In sequential anytime-valid inference, any admissible procedure must be based on e-processes: generalizations of test martingales that quantify the accumulated evidence against a composite null hypoth...  
URL: https://arxiv.org/abs/2402.09698

**8. Bayesian Online Multiple Testing: A Resource Allocation Approach**  
作者: Ruicheng Ao,Hongyu Chen,David Simchi-Levi,Feng Zhu  
摘要: We consider the problem of sequentially conducting multiple experiments where each experiment corresponds to a hypothesis testing task. At each time point, the experimenter must make an irrevocable de...  
URL: https://arxiv.org/abs/2402.11425

**9. Integrating Active Learning in Causal Inference with Interference: A Novel Approach in Online Experiments**  
作者: Hongtao Zhu,Sizhe Zhang,Yang Su,Zhenyu Zhao,Nan Chen  
摘要: In the domain of causal inference research, the prevalent potential outcomes framework, notably the Rubin Causal Model (RCM), often overlooks individual interference and assumes independent treatment ...  
URL: https://arxiv.org/abs/2402.12710

**10. Towards Generalizing Inferences from Trials to Target Populations**  
作者: Melody Y Huang,Harsh Parikh  
摘要: Randomized Controlled Trials (RCTs) are pivotal in generating internally valid estimates with minimal assumptions, serving as a cornerstone for researchers dedicated to advancing causal inference meth...  
URL: https://arxiv.org/abs/2402.17042

## eess.SY (系统与控制)

**1. Controller Synthesis from Noisy-Input Noisy-Output Data**  
作者: Lidong Li,Andrea Bisoffi,Claudio De Persis,Nima Monshizadeh  
摘要: We consider the problem of synthesizing a dynamic output-feedback controller for a linear system, using solely input-output data corrupted by measurement noise. To handle input-output data, an auxilia...  
URL: https://arxiv.org/abs/2402.02588

**2. Few-Shot Scenario Testing for Autonomous Vehicles Based on Neighborhood Coverage and Similarity**  
作者: Shu Li,Jingxuan Yang,Honglin He,Yi Zhang,Jianming Hu,Shuo Feng  
摘要: Testing and evaluating the safety performance of autonomous vehicles (AVs) is essential before the large-scale deployment. Practically, the number of testing scenarios permissible for a specific AV is...  
URL: https://arxiv.org/abs/2402.01795

**3. A Review on Internet of Things for Defense and Public Safety**  
作者: Paula Fraga-Lamas,Tiago M. Fernández-Caramés,Manuel Suárez-Albela,Luis Castedo,Miguel González-López  
摘要: The Internet of Things (IoT) is undeniably transforming the way that organizations communicate and organize everyday businesses and industrial procedures. Its adoption has proven well suited for secto...  
URL: https://arxiv.org/abs/2402.03599

**4. ANN-based position and speed sensorless estimation for BLDC motors**  
作者: Jose-Carlos Gamazo-Real,Victor Martinez-Martinez,Jaime Gomez-Gil  
摘要: BLDC motor applications require precise position and speed measurements, traditionally obtained with sensors. This article presents a method for estimating those measurements without position sensors ...  
URL: https://arxiv.org/abs/2402.03534

**5. Decentralized Event-Triggered Online Learning for Safe Consensus of Multi-Agent Systems with Gaussian Process Regression**  
作者: Xiaobing Dai,Zewen Yang,Mengtian Xu,Fangzhou Liu,Georges Hattab,Sandra Hirche  
摘要: Consensus control in multi-agent systems has received significant attention and practical implementation across various domains. However, managing consensus control under unknown dynamics remains a si...  
URL: https://arxiv.org/abs/2402.03174

**6. SafEDMD: A certified learning architecture tailored to data-driven control of nonlinear dynamical systems**  
作者: Robin Strässer,Manuel Schaller,Karl Worthmann,Julian Berberich,Frank Allgöwer  
摘要: The Koopman operator serves as the theoretical backbone for machine learning of dynamical control systems, where the operator is heuristically approximated by extended dynamic mode decomposition (EDMD...  
URL: https://arxiv.org/abs/2402.03145

**7. Multi-Agent Reinforcement Learning for Offloading Cellular Communications with Cooperating UAVs**  
作者: Abhishek Mondal,Deepak Mishra,Ganesh Prasad,George C. Alexandropoulos,Azzam Alnahari,Riku Jantti  
摘要: Effective solutions for intelligent data collection in terrestrial cellular networks are crucial, especially in the context of Internet of Things applications. The limited spectrum and coverage area o...  
URL: https://arxiv.org/abs/2402.02957

**8. A Digital Twin Design Methodology for Control, Simulation, and Monitoring of Fluidic Circuits**  
作者: Veyis Gunes  
摘要: We propose a synthesis method for the design of digital twins applicable to various systems (pneumatic, hydraulic, electrical/electronic circuits). The methodology allows representing the operation of...  
URL: https://arxiv.org/abs/2402.04058

**9. Conformal Predictive Programming for Chance Constrained Optimization**  
作者: Yiqi Zhao,Xinyi Yu,Jyotirmoy V. Deshmukh,Lars Lindemann  
摘要: Motivated by the advances in conformal prediction (CP), we propose conformal predictive programming (CPP), an approach to solve chance constrained optimization (CCO) problems, i.e., optimization probl...  
URL: https://arxiv.org/abs/2402.07407

**10. Safe Guaranteed Exploration for Non-linear Systems**  
作者: Manish Prajapat,Johannes Köhler,Matteo Turchetta,Andreas Krause,Melanie N. Zeilinger  
摘要: Safely exploring environments with a-priori unknown constraints is a fundamental challenge that restricts the autonomy of robots. While safety is paramount, guarantees on sufficient exploration are al...  
URL: https://arxiv.org/abs/2402.06562

... 以及其他 21 篇论文

## astro-ph.CO (宇宙学和非银河系天体物理学)

**1. Impact of PSF misestimation and galaxy population bias on precision shear measurement using a CNN**  
作者: Lisa Voigt  
摘要: Weak gravitational lensing of distant galaxies provides a powerful probe of dark energy. The aim of this study is to investigate the application of convolutional neural networks (CNNs) to precision sh...  
URL: https://arxiv.org/abs/2402.02578

**2. A possible late-time transition of $M\_B$ inferred via neural networks**  
作者: Purba Mukherjee,Konstantinos F. Dialektopoulos,Jackson Levi Said,Jurgen Mifsud  
摘要: The strengthening of tensions in the cosmological parameters has led to a reconsideration of fundamental aspects of standard cosmology. The tension in the Hubble constant can also be viewed as a tensi...  
URL: https://arxiv.org/abs/2402.10502

**3. syren-halofit: A fast, interpretable, high-precision formula for the $Λ$CDM nonlinear matter power spectrum**  
作者: Deaglan J. Bartlett,Benjamin D. Wandelt,Matteo Zennaro,Pedro G. Ferreira,Harry Desmond  
摘要: Rapid and accurate evaluation of the nonlinear matter power spectrum, $P(k)$, as a function of cosmological parameters and redshift is of fundamental importance in cosmology. Analytic approximations p...  
URL: https://arxiv.org/abs/2402.17492

**4. Dark energy reconstruction analysis with artificial neural networks: Application on simulated Supernova Ia data from Rubin Observatory**  
作者: Ayan Mitra,Isidro Gómez-Vargas,Vasilios Zarikas  
摘要: In this paper, we present an analysis of Supernova Ia (SNIa) distance moduli $μ(z)$ and dark energy using an Artificial Neural Network (ANN) reconstruction based on LSST simulated three-year SNIa data...  
URL: https://arxiv.org/abs/2402.18124

## cs.ET (新兴技术)

**1. Neuromorphic hardware for sustainable AI data centers**  
作者: Bernhard Vogginger,Amirhossein Rostami,Vaibhav Jain,Sirine Arfa,Andreas Hantsch,David Kappel,Michael Schäfer,Ulrike Faltings,Hector A. Gonzalez,Chen Liu,Christian Mayr,Wolfgang Maaß  
摘要: As humans advance toward a higher level of artificial intelligence, it is always at the cost of escalating computational resource consumption, which requires developing novel solutions to meet the exp...  
URL: https://arxiv.org/abs/2402.02521

**2. Low-power scalable multilayer optoelectronic neural networks enabled with incoherent light**  
作者: Alexander Song,Sai Nikhilesh Murty Kottapalli,Rahul Goyal,Bernhard Schölkopf,Peer Fischer  
摘要: Optical approaches have made great strides towards the goal of high-speed, energy-efficient computing necessary for modern deep learning and AI applications. Read-in and read-out of data, however, lim...  
URL: https://arxiv.org/abs/2402.01988

**3. Reconfigurable Stochastic Neurons Based on Strain Engineered Low Barrier Nanomagnets**  
作者: Rahnuma Rahman,Samiran Ganguly,Supriyo Bandyopadhyay  
摘要: Stochastic neurons are efficient hardware accelerators for solving a large variety of combinatorial optimization problems. "Binary" stochastic neurons (BSN) are those whose states fluctuate randomly b...  
URL: https://arxiv.org/abs/2402.06168

**4. TeMPO: Efficient Time-Multiplexed Dynamic Photonic Tensor Core for Edge AI with Compact Slow-Light Electro-Optic Modulator**  
作者: Meng Zhang,Dennis Yin,Nicholas Gangi,Amir Begović,Alexander Chen,Zhaoran Rena Huang,Jiaqi Gu  
摘要: Electronic-photonic computing systems offer immense potential in energy-efficient artificial intelligence (AI) acceleration tasks due to the superior computing speed and efficiency of optics, especial...  
URL: https://arxiv.org/abs/2402.07393

**5. Training Coupled Phase Oscillators as a Neuromorphic Platform using Equilibrium Propagation**  
作者: Qingshan Wang,Clara C. Wanjura,Florian Marquardt  
摘要: Given the rapidly growing scale and resource requirements of machine learning applications, the idea of building more efficient learning machines much closer to the laws of physics is an attractive pr...  
URL: https://arxiv.org/abs/2402.08579

**6. A Fast Algorithm to Simulate Nonlinear Resistive Networks**  
作者: Benjamin Scellier  
摘要: Analog electrical networks have long been investigated as energy-efficient computing platforms for machine learning, leveraging analog physics during inference. More recently, resistor networks have s...  
URL: https://arxiv.org/abs/2402.11674

**7. Pseudo-Random Generator based on a Photonic Neuromorphic Physical Unclonable Function**  
作者: Dimitris Dermanis,Panagiotis Rizomiliotis,Adonis Bogris,Charis Mesaritakis  
摘要: In this work we provide numerical results concerning a silicon-on-insulator photonic neuromorphic circuit configured as a physical unclonable function. The proposed scheme is enhanced with the capabil...  
URL: https://arxiv.org/abs/2402.14876

**8. Streaming IoT Data and the Quantum Edge: A Classic/Quantum Machine Learning Use Case**  
作者: Sabrina Herbst,Vincenzo De Maio,Ivona Brandic  
摘要: With the advent of the Post-Moore era, the scientific community is faced with the challenge of addressing the demands of current data-intensive machine learning applications, which are the cornerstone...  
URL: https://arxiv.org/abs/2402.15542

**9. Lightweight, error-tolerant edge detection using memristor-enabled stochastic logics**  
作者: Lekai Song,Pengyu Liu,Jingfang Pei,Yang Liu,Songwei Liu,Shengbo Wang,Leonard W. T. Ng,Tawfique Hasan,Kong-Pang Pun,Shuo Gao,Guohua Hu  
摘要: The demand for efficient edge vision has spurred the interest in developing stochastic computing approaches for performing image processing tasks. Memristors with inherent stochasticity readily introd...  
URL: https://arxiv.org/abs/2402.16908

## physics.optics (光学)

**1. Multiplexed all-optical permutation operations using a reconfigurable diffractive optical network**  
作者: Guangdong Ma,Xilin Yang,Bijie Bai,Jingxi Li,Yuhang Li,Tianyi Gan,Che-Yung Shen,Yijie Zhang,Yuzhu Li,Mona Jarrahi,Aydogan Ozcan  
摘要: Large-scale and high-dimensional permutation operations are important for various applications in e.g., telecommunications and encryption. Here, we demonstrate the use of all-optical diffractive compu...  
URL: https://arxiv.org/abs/2402.02397

**2. Machine Learning Resistant Amorphous Silicon Physically Unclonable Functions (PUFs)**  
作者: Velat Kilic,Neil Macfarlane,Jasper Stround,Samuel Metais,Milad Alemohammad,A. Brinton Cooper,Amy C. Foster,Mark A. Foster  
摘要: We investigate usage of nonlinear wave chaotic amorphous silicon (a-Si) cavities as physically unclonable functions (PUF). Machine learning attacks on integrated electronic PUFs have been demonstrated...  
URL: https://arxiv.org/abs/2402.02846

**3. 3D-2D Neural Nets for Phase Retrieval in Noisy Interferometric Imaging**  
作者: Andrew H. Proppe,Guillaume Thekkadath,Duncan England,Philip J. Bustard,Frédéric Bouchard,Jeff S. Lundeen,Benjamin J. Sussman  
摘要: In recent years, neural networks have been used to solve phase retrieval problems in imaging with superior accuracy and speed than traditional techniques, especially in the presence of noise. However,...  
URL: https://arxiv.org/abs/2402.06063

**4. Unconventional Computing based on Four Wave Mixing in Highly Nonlinear Waveguides**  
作者: Kostas Sozos,Stavros Deligiannidis,Charis Mesaritakis,Adonis Bogris  
摘要: In this work we numerically analyze a photonic unconventional accelerator based on the four-wave mixing effect in highly nonlinear waveguides. The proposed scheme can act as a fully analogue system fo...  
URL: https://arxiv.org/abs/2402.09135

**5. Photonic Neural Network Fabricated on Thin Film Lithium Niobate for High-Fidelity and Power-Efficient Matrix Computation**  
作者: Yong Zheng,Rongbo Wu,Yuan Ren,Rui Bao,Jian Liu,Yu Ma,Min Wang,Ya Cheng  
摘要: Photonic neural networks (PNNs) have emerged as a promising platform to address the energy consumption issue that comes with the advancement of artificial intelligence technology, and thin film lithiu...  
URL: https://arxiv.org/abs/2402.16513

## math.AP (偏微分方程分析)

**1. Efficient Numerical Wave Propagation Enhanced By An End-to-End Deep Learning Model**  
作者: Luis Kaiser,Richard Tsai,Christian Klingenberg  
摘要: In a variety of scientific and engineering domains, the need for high-fidelity and efficient solutions for high-frequency wave propagation holds great significance. Recent advances in wave modeling us...  
URL: https://arxiv.org/abs/2402.02304

## cs.MS (数学软件)

**1. MATLAB Simulator of Level-Index Arithmetic**  
作者: Mantas Mikaitis  
摘要: Level-index arithmetic appeared in the 1980s. One of its principal purposes is to abolish the issues caused by underflows and overflows in floating point. However, level-index arithmetic does not expa...  
URL: https://arxiv.org/abs/2402.02301

**2. BlackJAX: Composable Bayesian inference in JAX**  
作者: Alberto Cabezas,Adrien Corenflos,Junpeng Lao,Rémi Louf,Antoine Carnec,Kaustubh Chaudhari,Reuben Cohn-Gordon,Jeremie Coullon,Wei Deng,Sam Duffield,Gerardo Durán-Martín,Marcin Elantkowski,Dan Foreman-Mackey,Michele Gregori,Carlos Iguaran,Ravin Kumar,Martin Lysy,Kevin Murphy,Juan Camilo Orduz,Karm Patel,Xi Wang,Rob Zinkov  
摘要: BlackJAX is a library implementing sampling and variational inference algorithms commonly used in Bayesian computation. It is designed for ease of use, speed, and modularity by taking a functional app...  
URL: https://arxiv.org/abs/2402.10797

## cond-mat.mtrl-sci (材料科学)

**1. Co-orchestration of Multiple Instruments to Uncover Structure-Property Relationships in Combinatorial Libraries**  
作者: Boris N. Slautin,Utkarsh Pratiush,Ilia N. Ivanov,Yongtao Liu,Rohit Pant,Xiaohang Zhang,Ichiro Takeuchi,Maxim A. Ziatdinov,Sergei V. Kalinin  
摘要: The rapid growth of automated and autonomous instrumentations brings forth an opportunity for the co-orchestration of multimodal tools, equipped with multiple sequential detection methods, or several ...  
URL: https://arxiv.org/abs/2402.02198

**2. Are LLMs Ready for Real-World Materials Discovery?**  
作者: Santiago Miret,N M Anoop Krishnan  
摘要: Large Language Models (LLMs) create exciting possibilities for powerful language processing tools to accelerate research in materials science. While LLMs have great potential to accelerate materials u...  
URL: https://arxiv.org/abs/2402.05200

**3. Physics-based material parameters extraction from perovskite experiments via Bayesian optimization**  
作者: Hualin Zhan,Viqar Ahmad,Azul Mayon,Grace Tabi,Anh Dinh Bui,Zhuofeng Li,Daniel Walter,Hieu Nguyen,Klaus Weber,Thomas White,Kylie Catchpole  
摘要: The ability to extract material parameters of perovskite from quantitative experimental analysis is essential for rational design of photovoltaic and optoelectronic applications. However, the difficul...  
URL: https://arxiv.org/abs/2402.11101

**4. Design of 2D Skyrmionic Metamaterial Through Controlled Assembly**  
作者: Qichen Xu,Zhuanglin Shen,Alexander Edström,I. P. Miranda,Zhiwei Lu,Anders Bergman,Danny Thonig,Wanjian Yin,Olle Eriksson,Anna Delin  
摘要: Despite extensive research on magnetic skyrmions and antiskyrmions, a significant challenge remains in crafting nontrivial high-order skyrmionic textures with varying, or even tailor-made, topologies....  
URL: https://arxiv.org/abs/2402.10874

**5. Accurate predictions of keyhole depths using machine learning-aided simulations**  
作者: Jiahui Zhang,Runbo Jiang,Kangming Li,Pengyu Chen,Xiao Shang,Zhiying Liu,Jason Hattrick-Simpers,Brian J. Simonds,Qianglong Wei,Hongze Wang,Tao Sun,Anthony D. Rollett,Yu Zou  
摘要: The keyhole phenomenon is widely observed in laser materials processing, including laser welding, remelting, cladding, drilling, and additive manufacturing. Keyhole-induced defects, primarily pores, d...  
URL: https://arxiv.org/abs/2402.16190

## cs.SI (社交和信息网络)

**1. Trustworthiness of $\mathbb{X}$ Users: A One-Class Classification Approach**  
作者: Tanveer Khan,Fahad Sohrab,Antonis Michalas,Moncef Gabbouj  
摘要: $\mathbb{X}$ (formerly Twitter) is a prominent online social media platform that plays an important role in sharing information making the content generated on this platform a valuable source of infor...  
URL: https://arxiv.org/abs/2402.02066

**2. Temporal Graph Analysis with TGX**  
作者: Razieh Shirzadkhani,Shenyang Huang,Elahe Kooshafar,Reihaneh Rabbany,Farimah Poursafaei  
摘要: Real-world networks, with their evolving relations, are best captured as temporal graphs. However, existing software libraries are largely designed for static graphs where the dynamic nature of tempor...  
URL: https://arxiv.org/abs/2402.03651

**3. MQuinE: a cure for "Z-paradox" in knowledge graph embedding models**  
作者: Yang Liu,Huang Fang,Yunfeng Cai,Mingming Sun  
摘要: Knowledge graph embedding (KGE) models achieved state-of-the-art results on many knowledge graph tasks including link prediction and information retrieval. Despite the superior performance of KGE mode...  
URL: https://arxiv.org/abs/2402.03583

**4. Influencer Identification on Link Predicted Graphs**  
作者: Laura P. Schaposnik,Raina Wu  
摘要: How would admissions look like in a it university program for influencers? In the realm of social network analysis, influence maximization and link prediction stand out as pivotal challenges. Influenc...  
URL: https://arxiv.org/abs/2402.03522

**5. Overcoming Order in Autoregressive Graph Generation**  
作者: Edo Cohen-Karlik,Eyal Rozenberg,Daniel Freedman  
摘要: Graph generation is a fundamental problem in various domains, including chemistry and social networks. Recent work has shown that molecular graph generation using recurrent neural networks (RNNs) is a...  
URL: https://arxiv.org/abs/2402.03387

**6. Adolescent relational behaviour and the obesity pandemic: A descriptive study applying social network analysis and machine learning techniques**  
作者: Pilar Marqués-Sánchez,María Cristina Martínez-Fernández,José Alberto Benítez-Andrades,Enedina Quiroga-Sánchez,María Teresa García-Ordás,Natalia Arias-Ramos  
摘要: Aim: To study the existence of subgroups by exploring the similarities between the attributes of the nodes of the groups, in relation to diet and gender and, to analyse the connectivity between groups...  
URL: https://arxiv.org/abs/2402.03385

**7. A Comprehensive Survey on Graph Reduction: Sparsification, Coarsening, and Condensation**  
作者: Mohammad Hashemi,Shengbo Gong,Juntong Ni,Wenqi Fan,B. Aditya Prakash,Wei Jin  
摘要: Many real-world datasets can be naturally represented as graphs, spanning a wide range of domains. However, the increasing complexity and size of graph datasets present significant challenges for anal...  
URL: https://arxiv.org/abs/2402.03358

**8. Harnessing Network Effect for Fake News Mitigation: Selecting Debunkers via Self-Imitation Learning**  
作者: Xiaofei Xu,Ke Deng,Michael Dann,Xiuzhen Zhang  
摘要: This study aims to minimize the influence of fake news on social networks by deploying debunkers to propagate true news. This is framed as a reinforcement learning problem, where, at each stage, one u...  
URL: https://arxiv.org/abs/2402.03357

**9. Reviving Life on the Edge: Joint Score-Based Graph Generation of Rich Edge Attributes**  
作者: Nimrod Berman,Eitan Kosman,Dotan Di Castro,Omri Azencot  
摘要: Graph generation is integral to various engineering and scientific disciplines. Nevertheless, existing methodologies tend to overlook the generation of edge attributes. However, we identify critical a...  
URL: https://arxiv.org/abs/2402.04046

**10. BotSSCL: Social Bot Detection with Self-Supervised Contrastive Learning**  
作者: Mohammad Majid Akhtar,Navid Shadman Bhuiyan,Rahat Masood,Muhammad Ikram,Salil S. Kanhere  
摘要: The detection of automated accounts, also known as "social bots", has been an increasingly important concern for online social networks (OSNs). While several methods have been proposed for detecting s...  
URL: https://arxiv.org/abs/2402.03740

... 以及其他 18 篇论文

## cs.GT (计算机科学与博弈论)

**1. Reducing Optimism Bias in Incomplete Cooperative Games**  
作者: Filip Úradník,David Sychrovský,Jakub Černý,Martin Černý  
摘要: Cooperative game theory has diverse applications in contemporary artificial intelligence, including domains like interpretable machine learning, resource allocation, and collaborative decision-making....  
URL: https://arxiv.org/abs/2402.01930

**2. Markov Persuasion Processes: Learning to Persuade from Scratch**  
作者: Francesco Bacchiocchi,Francesco Emanuele Stradi,Matteo Castiglioni,Alberto Marchesi,Nicola Gatti  
摘要: In Bayesian persuasion, an informed sender strategically discloses information to a receiver so as to persuade them to undertake desirable actions. Recently, a growing attention has been devoted to se...  
URL: https://arxiv.org/abs/2402.03077

**3. Solving Hierarchical Information-Sharing Dec-POMDPs: An Extensive-Form Game Approach**  
作者: Johan Peralez,Aurélien Delage,Olivier Buffet,Jilles S. Dibangoye  
摘要: A recent theory shows that a multi-player decentralized partially observable Markov decision process can be transformed into an equivalent single-player game, enabling the application of \citeauthor{b...  
URL: https://arxiv.org/abs/2402.02954

**4. Leveraging Noisy Observations in Zero-Sum Games**  
作者: Emmanouil M Athanasakos,Samir M Perlaza  
摘要: This paper studies an instance of zero-sum games in which one player (the leader) commits to its opponent (the follower) to choose its actions by sampling a given probability measure (strategy). The a...  
URL: https://arxiv.org/abs/2402.02861

**5. Approximating the Core via Iterative Coalition Sampling**  
作者: Ian Gemp,Marc Lanctot,Luke Marris,Yiran Mao,Edgar Duéñez-Guzmán,Sarah Perrin,Andras Gyorgy,Romuald Elie,Georgios Piliouras,Michael Kaisers,Daniel Hennes,Kalesha Bullard,Kate Larson,Yoram Bachrach  
摘要: The core is a central solution concept in cooperative game theory, defined as the set of feasible allocations or payments such that no subset of agents has incentive to break away and form their own s...  
URL: https://arxiv.org/abs/2402.03928

**6. Strategically-Robust Learning Algorithms for Bidding in First-Price Auctions**  
作者: Rachitesh Kumar,Jon Schneider,Balasubramanian Sivan  
摘要: Learning to bid in repeated first-price auctions is a fundamental problem at the interface of game theory and machine learning, which has seen a recent surge in interest due to the transition of displ...  
URL: https://arxiv.org/abs/2402.07363

**7. Learning the Expected Core of Strictly Convex Stochastic Cooperative Games**  
作者: Nam Phuong Tran,The Anh Ta,Shuqing Shi,Debmalya Mandal,Yali Du,Long Tran-Thanh  
摘要: Reward allocation, also known as the credit assignment problem, has been an important topic in economics, engineering, and machine learning. An important concept in reward allocation is the core, whic...  
URL: https://arxiv.org/abs/2402.07067

**8. Automated Design of Affine Maximizer Mechanisms in Dynamic Settings**  
作者: Michael Curry,Vinzenz Thoma,Darshan Chakrabarti,Stephen McAleer,Christian Kroer,Tuomas Sandholm,Niao He,Sven Seuken  
摘要: Dynamic mechanism design is a challenging extension to ordinary mechanism design in which the mechanism designer must make a sequence of decisions over time in the face of possibly untruthful reports ...  
URL: https://arxiv.org/abs/2402.08129

**9. Understanding Model Selection For Learning In Strategic Environments**  
作者: Tinashe Handina,Eric Mazumdar  
摘要: The deployment of ever-larger machine learning models reflects a growing consensus that the more expressive the model class one optimizes over$\unicode{x2013}$and the more data one has access to$\unic...  
URL: https://arxiv.org/abs/2402.07588

**10. Learning Optimal Tax Design in Nonatomic Congestion Games**  
作者: Qiwen Cui,Maryam Fazel,Simon S. Du  
摘要: In multiplayer games, self-interested behavior among the players can harm the social welfare. Tax mechanisms are a common method to alleviate this issue and induce socially optimal behavior. In this w...  
URL: https://arxiv.org/abs/2402.07437

... 以及其他 14 篇论文

## hep-ex (高能物理-实验)

**1. Ultrafast jet classification on FPGAs for the HL-LHC**  
作者: Patrick Odagiu,Zhiqiang Que,Javier Duarte,Johannes Haller,Gregor Kasieczka,Artur Lobanov,Vladimir Loncar,Wayne Luk,Jennifer Ngadiuba,Maurizio Pierini,Philipp Rincke,Arpita Seksaria,Sioni Summers,Andre Sznajder,Alexander Tapper,Thea K. Aarrestad  
摘要: Three machine learning models are used to perform jet origin classification. These models are optimized for deployment on a field-programmable gate array device. In this context, we demonstrate how la...  
URL: https://arxiv.org/abs/2402.01876

**2. A Comparison of Deep Learning Models for Proton Background Rejection with the AMS Electromagnetic Calorimeter**  
作者: Raheem Karim Hashmani,Emre Akbaş,Melahat Bilge Demirköz  
摘要: The Alpha Magnetic Spectrometer (AMS) is a high-precision particle detector onboard the International Space Station containing six different subdetectors. The Transition Radiation Detector and Electro...  
URL: https://arxiv.org/abs/2402.16285

## q-bio.QM (定量方法)

**1. Unveiling Molecular Moieties through Hierarchical Graph Explainability**  
作者: Paolo Sortino,Salvatore Contino,Ugo Perricone,Roberto Pirrone  
摘要: Background: Graph Neural Networks (GNN) have emerged in very recent years as a powerful tool for supporting in silico Virtual Screening. In this work we present a GNN which uses Graph Convolutional ar...  
URL: https://arxiv.org/abs/2402.01744

**2. Learning from Two Decades of Blood Pressure Data: Demography-Specific Patterns Across 75 Million Patient Encounters**  
作者: Seyedeh Somayyeh Mousavi,Yuting Guo,Abeed Sarker,Reza Sameni  
摘要: Hypertension is a global health concern with an increasing prevalence, underscoring the need for effective monitoring and analysis of blood pressure (BP) dynamics. We analyzed a substantial BP dataset...  
URL: https://arxiv.org/abs/2402.01598

**3. Progress and Opportunities of Foundation Models in Bioinformatics**  
作者: Qing Li,Zhihang Hu,Yixuan Wang,Lei Li,Yimin Fan,Irwin King,Le Song,Yu Li  
摘要: Bioinformatics has witnessed a paradigm shift with the increasing integration of artificial intelligence (AI), particularly through the adoption of foundation models (FMs). These AI techniques have ra...  
URL: https://arxiv.org/abs/2402.04286

**4. MolTC: Towards Molecular Relational Modeling In Language Models**  
作者: Junfeng Fang,Shuai Zhang,Chang Wu,Zhengyi Yang,Zhiyuan Liu,Sihang Li,Kun Wang,Wenjie Du,Xiang Wang  
摘要: Molecular Relational Learning (MRL), aiming to understand interactions between molecular pairs, plays a pivotal role in advancing biochemical research. Recently, the adoption of large language models ...  
URL: https://arxiv.org/abs/2402.03781

**5. Decoupled Sequence and Structure Generation for Realistic Antibody Design**  
作者: Nayoung Kim,Minsu Kim,Sungsoo Ahn,Jinkyoo Park  
摘要: Recently, deep learning has made rapid progress in antibody design, which plays a key role in the advancement of therapeutics. A dominant paradigm is to train a model to jointly generate the antibody ...  
URL: https://arxiv.org/abs/2402.05982

**6. idMotif: An Interactive Motif Identification in Protein Sequences**  
作者: Ji Hwan Park,Vikash Prasad,Sydney Newsom,Fares Najar,Rakhi Rajan  
摘要: This article introduces idMotif, a visual analytics framework designed to aid domain experts in the identification of motifs within protein sequences. Motifs, short sequences of amino acids, are criti...  
URL: https://arxiv.org/abs/2402.05953

**7. Retrosynthesis Prediction via Search in (Hyper) Graph**  
作者: Zixun Lan,Binjie Hong,Jiajun Zhu,Zuo Zeng,Zhenfu Liu,Limin Yu,Fei Ma  
摘要: Predicting reactants from a specified core product stands as a fundamental challenge within organic synthesis, termed retrosynthesis prediction. Recently, semi-template-based methods and graph-edits-b...  
URL: https://arxiv.org/abs/2402.06772

**8. Optimizing the Design of an Artificial Pancreas to Improve Diabetes Management**  
作者: Ashok Khanna,Olivier Francon,Risto Miikkulainen  
摘要: Diabetes, a chronic condition that impairs how the body turns food into energy, i.e. blood glucose, affects 38 million people in the US alone. The standard treatment is to supplement carbohydrate inta...  
URL: https://arxiv.org/abs/2402.07949

**9. evolSOM: an R Package for evolutionary conservation analysis with SOMs**  
作者: Santiago Prochetto,Renata Reinheimer,Georgina Stegmayer  
摘要: Motivation: Unraveling the connection between genes and traits is crucial for solving many biological puzzles. Genes provide instructions for building cellular machinery, directing the processes that ...  
URL: https://arxiv.org/abs/2402.07948

**10. Towards a Foundation Model for Brain Age Prediction using coVariance Neural Networks**  
作者: Saurabh Sihag,Gonzalo Mateos,Alejandro Ribeiro  
摘要: Brain age is the estimate of biological age derived from neuroimaging datasets using machine learning algorithms. Increasing brain age with respect to chronological age can reflect increased vulnerabi...  
URL: https://arxiv.org/abs/2402.07684

... 以及其他 8 篇论文

## physics.chem-ph (化学物理)

**1. Learning Collective Variables with Synthetic Data Augmentation through Physics-Inspired Geodesic Interpolation**  
作者: Soojung Yang,Juno Nam,Johannes C. B. Dietschreit,Rafael Gómez-Bombarelli  
摘要: In molecular dynamics simulations, rare events, such as protein folding, are typically studied using enhanced sampling techniques, most of which are based on the definition of a collective variable (C...  
URL: https://arxiv.org/abs/2402.01542

**2. An Artificial Intelligence (AI) workflow for catalyst design and optimization**  
作者: Nung Siong Lai,Yi Shen Tew,Xialin Zhong,Jun Yin,Jiali Li,Binhang Yan,Xiaonan Wang  
摘要: In the pursuit of novel catalyst development to address pressing environmental concerns and energy demand, conventional design and optimization methods often fall short due to the complexity and vastn...  
URL: https://arxiv.org/abs/2402.04557

**3. Gaussian Plane-Wave Neural Operator for Electron Density Estimation**  
作者: Seongsu Kim,Sungsoo Ahn  
摘要: This work studies machine learning for electron density prediction, which is fundamental for understanding chemical systems and density functional theory (DFT) simulations. To this end, we introduce t...  
URL: https://arxiv.org/abs/2402.04278

**4. Zero Shot Molecular Generation via Similarity Kernels**  
作者: Rokas Elijošius,Fabian Zills,Ilyes Batatia,Sam Walton Norwood,Dávid Péter Kovács,Christian Holm,Gábor Csányi  
摘要: Generative modelling aims to accelerate the discovery of novel chemicals by directly proposing structures with desirable properties. Recently, score-based, or diffusion, generative models have signifi...  
URL: https://arxiv.org/abs/2402.08708

**5. ChemReasoner: Heuristic Search over a Large Language Model's Knowledge Space using Quantum-Chemical Feedback**  
作者: Henry W. Sprueill,Carl Edwards,Khushbu Agarwal,Mariefel V. Olarte,Udishnu Sanyal,Conrad Johnston,Hongbin Liu,Heng Ji,Sutanay Choudhury  
摘要: The discovery of new catalysts is essential for the design of new and more efficient chemical processes in order to transition to a sustainable future. We introduce an AI-guided computational screenin...  
URL: https://arxiv.org/abs/2402.10980

**6. Image Super-resolution Inspired Electron Density Prediction**  
作者: Chenghan Li,Or Sharir,Shunyue Yuan,Garnet K. Chan  
摘要: Drawing inspiration from the domain of image super-resolution, we view the electron density as a 3D grayscale image and use a convolutional residual network to transform a crude and trivially generate...  
URL: https://arxiv.org/abs/2402.12335

**7. Molecule Generation and Optimization for Efficient Fragrance Creation**  
作者: Bruno C. L. Rodrigues,Vinicius V. Santana,Sandris Murins,Idelfonso B. R. Nogueira  
摘要: This research introduces a Machine Learning-centric approach to replicate olfactory experiences, validated through experimental quantification of perfume perception. Key contributions encompass a hybr...  
URL: https://arxiv.org/abs/2402.12134

**8. TrustMol: Trustworthy Inverse Molecular Design via Alignment with Molecular Dynamics**  
作者: Kevin Tirta Wijaya,Navid Ansari,Hans-Peter Seidel,Vahid Babaei  
摘要: Data-driven generation of molecules with desired properties, also known as inverse molecular design (IMD), has attracted significant attention in recent years. Despite the significant progress in the ...  
URL: https://arxiv.org/abs/2402.16930

**9. Revealing the Relationship Between Publication Bias and Chemical Reactivity with Contrastive Learning**  
作者: Wenhao Gao,Priyanka Raghavan,Ron Shprints,Connor W. Coley  
摘要: A synthetic method's substrate tolerance and generality are often showcased in a "substrate scope" table. However, substrate selection exhibits a frequently discussed publication bias: unsuccessful ex...  
URL: https://arxiv.org/abs/2402.16882

**10. Outlier-Detection for Reactive Machine Learned Potential Energy Surfaces**  
作者: Luis Itza Vazquez-Salazar,Silvan Käser,Markus Meuwly  
摘要: Uncertainty quantification (UQ) to detect samples with large expected errors (outliers) is applied to reactive molecular potential energy surfaces (PESs). Three methods - Ensembles, Deep Evidential Re...  
URL: https://arxiv.org/abs/2402.17686

## cs.FL (形式语言和自动机理论)

**1. Backward Responsibility in Transition Systems Using General Power Indices**  
作者: Christel Baier,Roxane van den Bossche,Sascha Klüppelholz,Johannes Lehmann,Jakob Piribauer  
摘要: To improve reliability and the understanding of AI systems, there is increasing interest in the use of formal methods, e.g. model checking. Model checking tools produce a counterexample when a model d...  
URL: https://arxiv.org/abs/2402.01539

**2. Random Deterministic Automata With One Added Transition**  
作者: Arnaud Carayol,Philippe Duchon,Florent Koechlin,Cyril Nicaud  
摘要: Every language recognized by a non-deterministic finite automaton can be recognized by a deterministic automaton, at the cost of a potential increase of the number of states, which in the worst case c...  
URL: https://arxiv.org/abs/2402.06591

**3. Inform: From Compartmental Models to Stochastic Bounded Counter Machines**  
作者: Tim Leys,Guillermo A. Perez  
摘要: Compartmental models are used in epidemiology to capture the evolution of infectious diseases such as COVID-19 in a population by assigning members of it to compartments with labels such as susceptibl...  
URL: https://arxiv.org/abs/2402.09121

**4. Regular Languages in the Sliding Window Model**  
作者: Moses Ganardi,Danny Hucke,Markus Lohrey,Konstantinos Mamouras,Tatiana Starikovskaya  
摘要: We study the space complexity of the following problem: For a fixed regular language $L$, test membership of a sliding window of length $n$ to $L$ over a given stream of symbols. For deterministic str...  
URL: https://arxiv.org/abs/2402.13385

**5. On Algorithms verifying Initial-and-Final-State Opacity: Complexity, Special Cases, and Comparison**  
作者: Tomáš Masopust,Petr Osička  
摘要: Opacity is a general framework modeling security properties of systems interacting with a passive attacker. Initial-and-final-state opacity (IFO) generalizes the classical notions of opacity, such as ...  
URL: https://arxiv.org/abs/2402.17000

## cs.OH (其他计算机科学)

**1. Selenium-Jupiter: A JUnit 5 extension for Selenium WebDriver**  
作者: Boni García,Carlos Delgado Kloos,Carlos Alario-Hoyos,Mario Munoz-Organero  
摘要: Selenium WebDriver is a library that allows controlling web browsers (e.g., Chrome, Firefox, etc.) programmatically. It provides a cross-browser programming interface in several languages used primari...  
URL: https://arxiv.org/abs/2402.01480

**2. Research on the evolution of domestic multi-functional meter technology**  
作者: Zhen Zhang  
摘要: The technical evolution of domestic multi-functional electricity meter is deeply discussed. With the rapid development of the domestic power market and the continuous innovation of technology, the dom...  
URL: https://arxiv.org/abs/2402.05573

**3. Is 3-(F)WL Enough to Distinguish All 3D Graphs?**  
作者: Wanghan Xu  
摘要: The problem of graph isomorphism is an important but challenging problem in the field of graph analysis, for example: analyzing the similarity of two chemical molecules, or studying the expressive abi...  
URL: https://arxiv.org/abs/2402.08429

## q-fin.TR (交易和市场微观结构)

**1. Learning the Market: Sentiment-Based Ensemble Trading Agents**  
作者: Andrew Ye,James Xu,Vidyut Veedgav,Yi Wang,Yifan Yu,Daniel Yan,Ryan Chen,Vipin Chaudhary,Shuai Xu  
摘要: We propose and study the integration of sentiment analysis and deep reinforcement learning ensemble algorithms for stock trading by evaluating strategies capable of dynamically altering their active a...  
URL: https://arxiv.org/abs/2402.01441

**2. End-to-End Policy Learning of a Statistical Arbitrage Autoencoder Architecture**  
作者: Fabian Krause,Jan-Peter Calliess  
摘要: In Statistical Arbitrage (StatArb), classical mean reversion trading strategies typically hinge on asset-pricing or PCA based models to identify the mean of a synthetic asset. Once such a (linear) mod...  
URL: https://arxiv.org/abs/2402.08233

## cond-mat.stat-mech (统计力学)

**1. Inferring the Langevin Equation with Uncertainty via Bayesian Neural Networks**  
作者: Youngkyoung Bae,Seungwoong Ha,Hawoong Jeong  
摘要: Pervasive across diverse domains, stochastic systems exhibit fluctuations in processes ranging from molecular dynamics to climate phenomena. The Langevin equation has served as a common mathematical m...  
URL: https://arxiv.org/abs/2402.01338

## astro-ph.IM (天体物理学仪器和方法)

**1. Differentiable and accelerated wavelet transforms on the sphere and ball**  
作者: Matthew A. Price,Alicja Polanska,Jessica Whitney,Jason D. McEwen  
摘要: Directional wavelet dictionaries are hierarchical representations which efficiently capture and segment information across scale, location and orientation. Such representations demonstrate a particula...  
URL: https://arxiv.org/abs/2402.01282

**2. Preliminary Report on Mantis Shrimp: a Multi-Survey Computer Vision Photometric Redshift Model**  
作者: Andrew Engel,Gautham Narayan,Nell Byler  
摘要: The availability of large, public, multi-modal astronomical datasets presents an opportunity to execute novel research that straddles the line between science of AI and science of astronomy. Photometr...  
URL: https://arxiv.org/abs/2402.03535

**3. cecilia: A Machine Learning-Based Pipeline for Measuring Metal Abundances of Helium-rich Polluted White Dwarfs**  
作者: M. Badenas-Agusti,J. Viaña,A. Vanderburg,S. Blouin,P. Dufour,S. Xu,L. Sha  
摘要: Over the past several decades, conventional spectral analysis techniques of polluted white dwarfs have become powerful tools to learn about the geology and chemistry of extrasolar bodies. Despite thei...  
URL: https://arxiv.org/abs/2402.05176

**4. LtU-ILI: An All-in-One Framework for Implicit Inference in Astrophysics and Cosmology**  
作者: Matthew Ho,Deaglan J. Bartlett,Nicolas Chartier,Carolina Cuesta-Lazaro,Simon Ding,Axel Lapel,Pablo Lemos,Christopher C. Lovell,T. Lucas Makinen,Chirag Modi,Viraj Pandya,Shivam Pandey,Lucia A. Perez,Benjamin Wandelt,Greg L. Bryan  
摘要: This paper presents the Learning the Universe Implicit Likelihood Inference (LtU-ILI) pipeline, a codebase for rapid, user-friendly, and cutting-edge machine learning (ML) inference in astrophysics an...  
URL: https://arxiv.org/abs/2402.05137

**5. Convolutional Neural Networks for signal detection in real LIGO data**  
作者: Ondřej Zelenka,Bernd Brügmann,Frank Ohme  
摘要: Searching the data of gravitational-wave detectors for signals from compact binary mergers is a computationally demanding task. Recently, machine learning algorithms have been proposed to address curr...  
URL: https://arxiv.org/abs/2402.07492

**6. Radio-astronomical Image Reconstruction with Conditional Denoising Diffusion Model**  
作者: Mariia Drozdova,Vitaliy Kinakh,Omkar Bait,Olga Taran,Erica Lastufka,Miroslava Dessauges-Zavadsky,Taras Holotyak,Daniel Schaerer,Slava Voloshynovskiy  
摘要: Reconstructing sky models from dirty radio images for accurate source localization and flux estimation is crucial for studying galaxy evolution at high redshift, especially in deep fields using instru...  
URL: https://arxiv.org/abs/2402.10204

**7. RFI-DRUnet: Restoring dynamic spectra corrupted by radio frequency interference -- Application to pulsar observations**  
作者: Xiao Zhang,Ismaël Cognard,Nicolas Dobigeon  
摘要: Radio frequency interference (RFI) have been an enduring concern in radio astronomy, particularly for the observations of pulsars which require high timing precision and data sensitivity. In most work...  
URL: https://arxiv.org/abs/2402.13867

**8. Novelty Detection on Radio Astronomy Data using Signatures**  
作者: Paola Arrubarrena,Maud Lemercier,Bojan Nikolic,Terry Lyons,Thomas Cass  
摘要: We introduce SigNova, a new semi-supervised framework for detecting anomalies in streamed data. While our initial examples focus on detecting radio-frequency interference (RFI) in digitized signals wi...  
URL: https://arxiv.org/abs/2402.14892

**9. Classification of compact radio sources in the Galactic plane with supervised machine learning**  
作者: S. Riggi,G. Umana,C. Trigilio,C. Bordiu,F. Bufano,A. Ingallinera,F. Cavallaro,Y. Gordon,R. P. Norris,G. Gürkan,P. Leto,C. Buemi,S. Loru,A. M. Hopkins,M. D. Filipović,T. Cecconello  
摘要: Generation of science-ready data from processed data products is one of the major challenges in next-generation radio continuum surveys with the Square Kilometre Array (SKA) and its precursors, due to...  
URL: https://arxiv.org/abs/2402.15232

**10. Prediction of the SYM-H Index Using a Bayesian Deep Learning Method with Uncertainty Quantification**  
作者: Yasser Abduallah,Khalid A. Alobaid,Jason T. L. Wang,Haimin Wang,Vania K. Jordanova,Vasyl Yurchyshyn,Huseyin Cavus,Ju Jing  
摘要: We propose a novel deep learning framework, named SYMHnet, which employs a graph neural network and a bidirectional long short-term memory network to cooperatively learn patterns from solar wind and i...  
URL: https://arxiv.org/abs/2402.17196

... 以及其他 1 篇论文

## math.LO (逻辑)

**1. Forcing with Language Fragments, Extending Namba Forcing, and Models of Theories with Constraints in Interpretation**  
作者: Desmond Lau  
摘要: We develop a forcing framework based on the idea of amalgamating language fragments into a theory with a canonical term model. We then demonstrate the usefulness of this framework by applying it to va...  
URL: https://arxiv.org/abs/2402.01213

## astro-ph.SR (太阳和恒星天体物理学)

**1. Active Region-based Flare Forecasting with Sliding Window Multivariate Time Series Forest Classifiers**  
作者: Anli Ji,Berkay Aydin  
摘要: Over the past few decades, many applications of physics-based simulations and data-driven techniques (including machine learning and deep learning) have emerged to analyze and predict solar flares. Th...  
URL: https://arxiv.org/abs/2402.03474

**2. Predicting the Emergence of Solar Active Regions Using Machine Learning**  
作者: Spiridon Kasapis,Irina N. Kitiashvili,Alexander G. Kosovichev,John T. Stefan,Bhairavi Apte  
摘要: To create early warning capabilities for upcoming Space Weather disturbances, we have selected a dataset of 61 emerging active regions, which allows us to identify characteristic features in the evolu...  
URL: https://arxiv.org/abs/2402.08890

**3. Short-Period Variables in TESS Full-Frame Image Light Curves Identified via Convolutional Neural Networks**  
作者: Greg Olmschenk,Richard K. Barry,Stela Ishitani Silva,Brian P. Powell,Ethan Kruse,Jeremy D. Schnittman,Agnieszka M. Cieplak,Thomas Barclay,Siddhant Solanki,Bianca Ortega,John Baker,Yesenia Helem Salinas Mamani  
摘要: The Transiting Exoplanet Survey Satellite (TESS) mission measured light from stars in ~85% of the sky throughout its two-year primary mission, resulting in millions of TESS 30-minute cadence light cur...  
URL: https://arxiv.org/abs/2402.12369

## math.NT (数论)

**1. Exploring Prime Number Classification: Achieving High Recall Rate and Rapid Convergence with Sparse Encoding**  
作者: Serin Lee,S. Kim  
摘要: This paper presents a novel approach at the intersection of machine learning and number theory, focusing on the classification of prime and non-prime numbers. At the core of our research is the develo...  
URL: https://arxiv.org/abs/2402.03363

## q-fin.ST (统计金融)

**1. Tweet Influence on Market Trends: Analyzing the Impact of Social Media Sentiment on Biotech Stocks**  
作者: C. Sarai R. Avila  
摘要: This study investigates the relationship between tweet sentiment across diverse categories: news, company opinions, CEO opinions, competitor opinions, and stock market behavior in the biotechnology se...  
URL: https://arxiv.org/abs/2402.03353

**2. A Study on Stock Forecasting Using Deep Learning and Statistical Models**  
作者: Himanshu Gupta,Aditya Jaiswal  
摘要: Predicting a fast and accurate model for stock price forecasting is been a challenging task and this is an active area of research where it is yet to be found which is the best way to forecast the sto...  
URL: https://arxiv.org/abs/2402.06689

**3. DiffsFormer: A Diffusion Transformer on Stock Factor Augmentation**  
作者: Yuan Gao,Haokun Chen,Xiang Wang,Zhicai Wang,Xue Wang,Jinyang Gao,Bolin Ding  
摘要: Machine learning models have demonstrated remarkable efficacy and efficiency in a wide range of stock forecasting tasks. However, the inherent challenges of data scarcity, including low signal-to-nois...  
URL: https://arxiv.org/abs/2402.06656

**4. From GARCH to Neural Network for Volatility Forecast**  
作者: Pengfei Zhao,Haoren Zhu,Wilfred Siu Hung NG,Dik Lun Lee  
摘要: Volatility, as a measure of uncertainty, plays a crucial role in numerous financial activities such as risk management. The Econometrics and Machine Learning communities have developed two distinct ap...  
URL: https://arxiv.org/abs/2402.06642

**5. Transformers with Attentive Federated Aggregation for Time Series Stock Forecasting**  
作者: Chu Myaet Thwal,Ye Lin Tun,Kitae Kim,Seong-Bae Park,Choong Seon Hong  
摘要: Recent innovations in transformers have shown their superior performance in natural language processing (NLP) and computer vision (CV). The ability to capture long-range dependencies and interactions ...  
URL: https://arxiv.org/abs/2402.06638

**6. Large (and Deep) Factor Models**  
作者: Bryan Kelly,Boris Kuznetsov,Semyon Malamud,Teng Andrea Xu  
摘要: We open up the black box behind Deep Learning for portfolio optimization and prove that a sufficiently wide and arbitrarily deep neural network (DNN) trained to maximize the Sharpe ratio of the Stocha...  
URL: https://arxiv.org/abs/2402.06635

**7. MDGNN: Multi-Relational Dynamic Graph Neural Network for Comprehensive and Dynamic Stock Investment Prediction**  
作者: Hao Qian,Hongting Zhou,Qian Zhao,Hao Chen,Hongxiang Yao,Jingwei Wang,Ziqi Liu,Fei Yu,Zhiqiang Zhang,Jun Zhou  
摘要: The stock market is a crucial component of the financial system, but predicting the movement of stock prices is challenging due to the dynamic and intricate relations arising from various aspects such...  
URL: https://arxiv.org/abs/2402.06633

**8. Analyzing Currency Fluctuations: A Comparative Study of GARCH, EWMA, and IV Models for GBP/USD and EUR/GBP Pairs**  
作者: Narayan Tondapu  
摘要: In this study, we examine the fluctuation in the value of the Great Britain Pound (GBP). We focus particularly on its relationship with the United States Dollar (USD) and the Euro (EUR) currency pairs...  
URL: https://arxiv.org/abs/2402.07435

**9. RAGIC: Risk-Aware Generative Adversarial Model for Stock Interval Construction**  
作者: Jingyi Gu,Wenlu Du,Guiling Wang  
摘要: Efforts to predict stock market outcomes have yielded limited success due to the inherently stochastic nature of the market, influenced by numerous unpredictable factors. Many existing prediction appr...  
URL: https://arxiv.org/abs/2402.10760

## physics.ed-ph (物理教育)

**1. Evaluating the Wide Area Classroom After 24,000 HPC Students**  
作者: John Urbanic,Thomas Maiden,Valerie Rossi  
摘要: As of 2023 we have taught more than 24,000 students over the course of 106 events using the Wide Area Classroom, a novel distributed teaching platform. This has been a successful effort gauged by seve...  
URL: https://arxiv.org/abs/2402.03343

## q-fin.CP (计算金融)

**1. CNN-DRL with Shuffled Features in Finance**  
作者: Sina Montazeri,Akram Mirzaeinia,Amir Mirzaeinia  
摘要: In prior methods, it was observed that the application of Convolutional Neural Networks agent in Deep Reinforcement Learning to financial data resulted in an enhanced reward. In this study, a specific...  
URL: https://arxiv.org/abs/2402.03338

**2. Alpha-GPT 2.0: Human-in-the-Loop AI for Quantitative Investment**  
作者: Hang Yuan,Saizhuo Wang,Jian Guo  
摘要: Recently, we introduced a new paradigm for alpha mining in the realm of quantitative investment, developing a new interactive alpha mining system framework, Alpha-GPT. This system is centered on itera...  
URL: https://arxiv.org/abs/2402.09746

**3. Emoji Driven Crypto Assets Market Reactions**  
作者: Xiaorui Zuo,Yao-Tsung Chen,Wolfgang Karl Härdle  
摘要: In the burgeoning realm of cryptocurrency, social media platforms like Twitter have become pivotal in influencing market trends and investor sentiments. In our study, we leverage GPT-4 and a fine-tune...  
URL: https://arxiv.org/abs/2402.10481

**4. Deep Hedging with Market Impact**  
作者: Andrei Neagu,Frédéric Godin,Clarence Simard,Leila Kosseim  
摘要: Dynamic hedging is the practice of periodically transacting financial instruments to offset the risk caused by an investment or a liability. Dynamic hedging optimization can be framed as a sequential ...  
URL: https://arxiv.org/abs/2402.13326

**5. Optimizing Portfolio Management and Risk Assessment in Digital Assets Using Deep Learning for Predictive Analysis**  
作者: Qishuo Cheng,Le Yang,Jiajian Zheng,Miao Tian,Duan Xin  
摘要: Portfolio management issues have been extensively studied in the field of artificial intelligence in recent years, but existing deep learning-based quantitative trading methods have some areas where t...  
URL: https://arxiv.org/abs/2402.15994

## cs.CE (计算工程、金融和科学)

**1. Learning solutions of parametric Navier-Stokes with physics-informed neural networks**  
作者: M. Naderibeni,M. J. T. Reinders,L. Wu,D. M. J. Tax  
摘要: We leverage Physics-Informed Neural Networks (PINNs) to learn solution functions of parametric Navier-Stokes Equations (NSE). Our proposed approach results in a feasible optimization problem setup tha...  
URL: https://arxiv.org/abs/2402.03153

**2. Interpretable domain knowledge enhanced machine learning framework on axial capacity prediction of circular CFST columns**  
作者: Dian Wang,Zhigang Ren,Gen Kondo  
摘要: This study introduces a novel machine learning framework, integrating domain knowledge, to accurately predict the bearing capacity of CFSTs, bridging the gap between traditional engineering and machin...  
URL: https://arxiv.org/abs/2402.04405

**3. I-FENN with Temporal Convolutional Networks: expediting the load-history analysis of non-local gradient damage propagation**  
作者: Panos Pantidis,Habiba Eldababy,Diab Abueidda,Mostafa E. Mobasher  
摘要: In this paper, we demonstrate for the first time how the Integrated Finite Element Neural Network (I-FENN) framework, previously proposed by the authors, can efficiently simulate the entire loading hi...  
URL: https://arxiv.org/abs/2402.05460

**4. Joint Source-Channel Coding for Wireless Image Transmission: A Deep Compressed-Sensing Based Method**  
作者: Mohammad Amin Jarrahi,Eirina Bourtsoulatze,Vahid Abolghasemi  
摘要: Nowadays, the demand for image transmission over wireless networks has surged significantly. To meet the need for swift delivery of high-quality images through time-varying channels with limited bandw...  
URL: https://arxiv.org/abs/2402.07162

**5. Nonlinear electro-elastic finite element analysis with neural network constitutive models**  
作者: Dominik K. Klein,Rogelio Ortigosa,Jesús Martínez-Frutos,Oliver Weeger  
摘要: In the present work, the applicability of physics-augmented neural network (PANN) constitutive models for complex electro-elastic finite element analysis is demonstrated. For the investigations, PANN ...  
URL: https://arxiv.org/abs/2402.07007

**6. A plastic correction algorithm for full-field elasto-plastic finite element simulations : critical assessment of predictive capabilities and improvement by machine learning**  
作者: Abhishek Palchoudhary,Simone Peter,Vincent Maurel,Cristian Ovalle,Pierre Kerfriden  
摘要: This paper introduces a new local plastic correction algorithm that is aimed at accelerating elasto-plastic finite element (FE) simulations for structural problems exhibiting localised plasticity (aro...  
URL: https://arxiv.org/abs/2402.06313

**7. Energy-based PINNs for solving coupled field problems: concepts and application to the multi-objective optimal design of an induction heater**  
作者: Marco Baldan,Paolo Di Barba  
摘要: Physics-informed neural networks (PINNs) are neural networks (NNs) that directly encode model equations, like Partial Differential Equations (PDEs), in the network itself. While most of the PINN algor...  
URL: https://arxiv.org/abs/2402.06261

**8. Multiscale graph neural networks with adaptive mesh refinement for accelerating mesh-based simulations**  
作者: Roberto Perera,Vinamra Agrawal  
摘要: Mesh-based Graph Neural Networks (GNNs) have recently shown capabilities to simulate complex multiphysics problems with accelerated performance times. However, mesh-based GNNs require a large number o...  
URL: https://arxiv.org/abs/2402.08863

**9. ProtChatGPT: Towards Understanding Proteins with Large Language Models**  
作者: Chao Wang,Hehe Fan,Ruijie Quan,Yi Yang  
摘要: Protein research is crucial in various fundamental disciplines, but understanding their intricate structure-function relationships remains challenging. Recent Large Language Models (LLMs) have made si...  
URL: https://arxiv.org/abs/2402.09649

**10. Mitigating subjectivity and bias in AI development indices: A robust approach to redefining country rankings**  
作者: Betania Silva C Campello,Guilherme Dean Pelegrina,Renata Pelissari,Ricardo Suyama,Leonardo Tomazeli Duarte  
摘要: Countries worldwide have been implementing different actions national strategies for Artificial Intelligence (AI) to shape policy priorities and guide their development concerning AI. Several AI indic...  
URL: https://arxiv.org/abs/2402.10122

... 以及其他 3 篇论文

## stat.AP (应用领域)

**1. Digital Twin for Grey Box modeling of Multistory residential building thermal dynamics**  
作者: Lina Morkunaite,Justas Kardoka,Darius Pupeikis,Paris Fokaides,Vangelis Angelakis  
摘要: Buildings energy efficiency is a widely researched topic, which is rapidly gaining popularity due to rising environmental concerns and the need for energy independence. In Northern Europe heating ener...  
URL: https://arxiv.org/abs/2402.02909

**2. Context-Aware Automated Passenger Counting Data Denoising**  
作者: Noëlie Cherrier,Baptiste Rérolle,Martin Graive,Amir Dib,Eglantine Schmitt  
摘要: A reliable and accurate knowledge of the ridership in public transportation networks is crucial for public transport operators and public authorities to be aware of their network's use and optimize tr...  
URL: https://arxiv.org/abs/2402.08688

**3. Fuzzy clustering of circular time series based on a new dependence measure with applications to wind data**  
作者: Ángel López-Oriona,Ying Sun,Rosa M. Crujeiras  
摘要: Time series clustering is an essential machine learning task with applications in many disciplines. While the majority of the methods focus on time series taking values on the real line, very few work...  
URL: https://arxiv.org/abs/2402.08687

**4. Estimating the age-conditioned average treatment effects curves: An application for assessing load-management strategies in the NBA**  
作者: Shinpei Nakamura-Sakai,Laura Forastiere,Brian Macdonald  
摘要: In the realm of competitive sports, understanding the performance dynamics of athletes, represented by the age curve (showing progression, peak, and decline), is vital. Our research introduces a novel...  
URL: https://arxiv.org/abs/2402.12400

**5. Measurement Uncertainty: Relating the uncertainties of physical and virtual measurements**  
作者: Simon Cramer,Tobias Müller,Robert H. Schmitt  
摘要: In the context of industrially mass-manufactured products, quality management is based on physically inspecting a small sample from a large batch and reasoning about the batch's quality conformance. W...  
URL: https://arxiv.org/abs/2402.13666

**6. A Causal Framework to Evaluate Racial Bias in Law Enforcement Systems**  
作者: Jessy Xinyi Han,Andrew Miller,S. Craig Watkins,Christopher Winship,Fotini Christia,Devavrat Shah  
摘要: We are interested in developing a data-driven method to evaluate race-induced biases in law enforcement systems. While the recent works have addressed this question in the context of police-civilian i...  
URL: https://arxiv.org/abs/2402.14959

## cond-mat.soft (软凝聚态物质)

**1. ProtAgents: Protein discovery via large language model multi-agent collaborations combining physics and machine learning**  
作者: A. Ghafarollahi,M. J. Buehler  
摘要: Designing de novo proteins beyond those found in nature holds significant promise for advancements in both scientific and engineering applications. Current methodologies for protein design often rely ...  
URL: https://arxiv.org/abs/2402.04268

**2. X-LoRA: Mixture of Low-Rank Adapter Experts, a Flexible Framework for Large Language Models with Applications in Protein Mechanics and Molecular Design**  
作者: Eric L. Buehler,Markus J. Buehler  
摘要: We report a mixture of expert strategy to create fine-tuned large language models using a deep layer-wise token-level approach based on low-rank adaptation (LoRA). Starting with a set of pre-trained L...  
URL: https://arxiv.org/abs/2402.07148

## physics.med-ph (医学物理)

**1. Application analysis of ai technology combined with spiral CT scanning in early lung cancer screening**  
作者: Shulin Li,Liqiang Yu,Bo Liu,Qunwei Lin,Jiaxin Huang  
摘要: At present, the incidence and fatality rate of lung cancer in China rank first among all malignant tumors. Despite the continuous development and improvement of China's medical level, the overall 5-ye...  
URL: https://arxiv.org/abs/2402.04267

**2. Neural Graphics Primitives-based Deformable Image Registration for On-the-fly Motion Extraction**  
作者: Xia Li,Fabian Zhang,Muheng Li,Damien Weber,Antony Lomax,Joachim Buhmann,Ye Zhang  
摘要: Intra-fraction motion in radiotherapy is commonly modeled using deformable image registration (DIR). However, existing methods often struggle to balance speed and accuracy, limiting their applicabilit...  
URL: https://arxiv.org/abs/2402.05568

**3. Enhancing signal detectability in learning-based CT reconstruction with a model observer inspired loss function**  
作者: Megan Lantz,Emil Y. Sidky,Ingrid S. Reiser,Xiaochuan Pan,Gregory Ongie  
摘要: Deep neural networks used for reconstructing sparse-view CT data are typically trained by minimizing a pixel-wise mean-squared error or similar loss function over a set of training images. However, ne...  
URL: https://arxiv.org/abs/2402.10010

**4. Segment anything model for head and neck tumor segmentation with CT, PET and MRI multi-modality images**  
作者: Jintao Ren,Mathis Rasmussen,Jasper Nijkamp,Jesper Grau Eriksen,Stine Korreman  
摘要: Deep learning presents novel opportunities for the auto-segmentation of gross tumor volume (GTV) in head and neck cancer (HNC), yet fully automatic methods usually necessitate significant manual refin...  
URL: https://arxiv.org/abs/2402.17454

## cond-mat.dis-nn (无序系统和神经网络)

**1. Analysis of Hopfield Model as Associative Memory**  
作者: Matteo Silvestri  
摘要: This article delves into the Hopfield neural network model, drawing inspiration from biological neural systems. The exploration begins with an overview of the model's foundations, incorporating insigh...  
URL: https://arxiv.org/abs/2402.04264

**2. Random features and polynomial rules**  
作者: Fabián Aguirre-López,Silvio Franz,Mauro Pastore  
摘要: Random features models play a distinguished role in the theory of deep learning, describing the behavior of neural networks close to their infinite-width limit. In this work, we present a thorough ana...  
URL: https://arxiv.org/abs/2402.10164

**3. Explaining the Machine Learning Solution of the Ising Model**  
作者: Roberto C. Alamino  
摘要: As powerful as machine learning (ML) techniques are in solving problems involving data with large dimensionality, explaining the results from the fitted parameters remains a challenging task of utmost...  
URL: https://arxiv.org/abs/2402.11701

**4. Convergence Acceleration of Markov Chain Monte Carlo-based Gradient Descent by Deep Unfolding**  
作者: Ryo Hagiwara,Satoshi Takabe  
摘要: This study proposes a trainable sampling-based solver for combinatorial optimization problems (COPs) using a deep-learning technique called deep unfolding. The proposed solver is based on the Ohzeki m...  
URL: https://arxiv.org/abs/2402.13608

## cond-mat.mes-hall (介观和纳米物理)

**1. Fully autonomous tuning of a spin qubit**  
作者: Jonas Schuff,Miguel J. Carballido,Madeleine Kotzagiannidis,Juan Carlos Calvo,Marco Caselli,Jacob Rawling,David L. Craig,Barnaby van Straaten,Brandon Severin,Federico Fedele,Simon Svab,Pierre Chevalier Kwon,Rafael S. Eggli,Taras Patlatiuk,Nathan Korda,Dominik Zumbühl,Natalia Ares  
摘要: Spanning over two decades, the study of qubits in semiconductors for quantum computing has yielded significant breakthroughs. However, the development of large-scale semiconductor quantum circuits is ...  
URL: https://arxiv.org/abs/2402.03931

## q-fin.RM (风险管理)

**1. Explainable Automated Machine Learning for Credit Decisions: Enhancing Human Artificial Intelligence Collaboration in Financial Engineering**  
作者: Marc Schmitt  
摘要: This paper explores the integration of Explainable Automated Machine Learning (AutoML) in the realm of financial engineering, specifically focusing on its application in credit decision-making. The ra...  
URL: https://arxiv.org/abs/2402.03806

**2. On the Potential of Network-Based Features for Fraud Detection**  
作者: Catayoun Azarm,Erman Acar,Mickey van Zeelt  
摘要: Online transaction fraud presents substantial challenges to businesses and consumers, risking significant financial losses. Conventional rule-based systems struggle to keep pace with evolving fraud ta...  
URL: https://arxiv.org/abs/2402.09495

## physics.flu-dyn (流体动力学)

**1. Reduced-order modeling of unsteady fluid flow using neural network ensembles**  
作者: Rakesh Halder,Mohammadmehdi Ataei,Hesam Salehipour,Krzysztof Fidkowski,Kevin Maki  
摘要: The use of deep learning has become increasingly popular in reduced-order models (ROMs) to obtain low-dimensional representations of full-order models. Convolutional autoencoders (CAEs) are often used...  
URL: https://arxiv.org/abs/2402.05372

**2. JAX-Fluids 2.0: Towards HPC for Differentiable CFD of Compressible Two-phase Flows**  
作者: Deniz A. Bezgin,Aaron B. Buhendwa,Nikolaus A. Adams  
摘要: In our effort to facilitate machine learning-assisted computational fluid dynamics (CFD), we introduce the second iteration of JAX-Fluids. JAX-Fluids is a Python-based fully-differentiable CFD solver ...  
URL: https://arxiv.org/abs/2402.05193

**3. A Novel Paradigm in Solving Multiscale Problems**  
作者: Jing Wang,Zheng Li,Pengyu Lai,Rui Wang,Di Yang,Dewu Yang,Hui Xu,Wen-Quan Tao  
摘要: Multiscale phenomena manifest across various scientific domains, presenting a ubiquitous challenge in accurately and effectively simulating multiscale dynamics in complex systems. In this paper, a nov...  
URL: https://arxiv.org/abs/2402.05067

**4. Neural SPH: Improved Neural Modeling of Lagrangian Fluid Dynamics**  
作者: Artur P. Toshev,Jonas A. Erbesdobler,Nikolaus A. Adams,Johannes Brandstetter  
摘要: Smoothed particle hydrodynamics (SPH) is omnipresent in modern engineering and scientific disciplines. SPH is a class of Lagrangian schemes that discretize fluid dynamics via finite material points th...  
URL: https://arxiv.org/abs/2402.06275

**5. Model-based deep reinforcement learning for accelerated learning from flow simulations**  
作者: Andre Weiner,Janis Geise  
摘要: In recent years, deep reinforcement learning has emerged as a technique to solve closed-loop flow control problems. Employing simulation-based environments in reinforcement learning enables a priori e...  
URL: https://arxiv.org/abs/2402.16543

**6. Understanding the training of PINNs for unsteady flow past a plunging foil through the lens of input subdomain level loss function gradients**  
作者: Rahul Sundar,Didier Lucor,Sunetra Sarkar  
摘要: Recently immersed boundary method-inspired physics-informed neural networks (PINNs) including the moving boundary-enabled PINNs (MB-PINNs) have shown the ability to accurately reconstruct velocity and...  
URL: https://arxiv.org/abs/2402.17346

## cs.GL (一般文献)

**1. History of generative Artificial Intelligence (AI) chatbots: past, present, and future development**  
作者: Md. Al-Amin,Mohammad Shazed Ali,Abdus Salam,Arif Khan,Ashraf Ali,Ahsan Ullah,Md Nur Alam,Shamsul Kabir Chowdhury  
摘要: This research provides an in-depth comprehensive review of the progress of chatbot technology over time, from the initial basic systems relying on rules to today's advanced conversational bots powered...  
URL: https://arxiv.org/abs/2402.05122

## math.CO (组合学)

**1. On a Combinatorial Problem Arising in Machine Teaching**  
作者: Brigt Håvardstun,Jan Kratochvíl,Joakim Sunde,Jan Arne Telle  
摘要: We study a model of machine teaching where the teacher mapping is constructed from a size function on both concepts and examples. The main question in machine teaching is the minimum number of example...  
URL: https://arxiv.org/abs/2402.04907

## cs.PF (表现)

**1. Reconsidering the performance of DEVS modeling and simulation environments using the DEVStone benchmark**  
作者: José L. Risco-Martín,Saurabh Mittal,Juan Carlos Fabero,Marina Zapater,Román Hermida  
摘要: The Discrete Event System Specification formalism (DEVS), which supports hierarchical and modular model composition, has been widely used to understand, analyze and develop a variety of systems. DEVS ...  
URL: https://arxiv.org/abs/2402.05483

**2. Integrating ytopt and libEnsemble to Autotune OpenMC**  
作者: Xingfu Wu,John R. Tramm,Jeffrey Larson,John-Luke Navarro,Prasanna Balaprakash,Brice Videau,Michael Kruse,Paul Hovland,Valerie Taylor,Mary Hall  
摘要: ytopt is a Python machine-learning-based autotuning software package developed within the ECP PROTEAS-TUNE project. The ytopt software adopts an asynchronous search framework that consists of sampling...  
URL: https://arxiv.org/abs/2402.09222

## cs.SC (符号计算)

**1. Computing Krylov iterates in the time of matrix multiplication**  
作者: Vincent Neiger,Clément Pernet,Gilles Villard  
摘要: Krylov methods rely on iterated matrix-vector products $A^k u\_j$ for an $n\times n$ matrix $A$ and vectors $u\_1,\ldots,u\_m$. The space spanned by all iterates $A^k u\_j$ admits a particular basis -- th...  
URL: https://arxiv.org/abs/2402.07345

## cs.CG (计算几何)

**1. CoRe-GD: A Hierarchical Framework for Scalable Graph Visualization with GNNs**  
作者: Florian Grötschla,Joël Mathys,Robert Veres,Roger Wattenhofer  
摘要: Graph Visualization, also known as Graph Drawing, aims to find geometric embeddings of graphs that optimize certain criteria. Stress is a widely used metric; stress is minimized when every pair of nod...  
URL: https://arxiv.org/abs/2402.06706

**2. A Class of Topological Pseudodistances for Fast Comparison of Persistence Diagrams**  
作者: Rolando Kindelan Nuñez,Mircea Petrache,Mauricio Cerda,Nancy Hitschfeld  
摘要: Persistence diagrams (PD)s play a central role in topological data analysis, and are used in an ever increasing variety of applications. The comparison of PD data requires computing comparison metrics...  
URL: https://arxiv.org/abs/2402.14489

## econ.GN (普通经济学)

**1. Artificial intelligence and the transformation of higher education institutions**  
作者: Evangelos Katsamakas,Oleg V. Pavlov,Ryan Saklad  
摘要: Artificial intelligence (AI) advances and the rapid adoption of generative AI tools like ChatGPT present new opportunities and challenges for higher education. While substantial literature discusses A...  
URL: https://arxiv.org/abs/2402.08143

## econ.EM (计量经济学)

**1. Finding Moving-Band Statistical Arbitrages via Convex-Concave Optimization**  
作者: Kasper Johansson,Thomas Schmelzer,Stephen Boyd  
摘要: We propose a new method for finding statistical arbitrages that can contain more assets than just the traditional pair. We formulate the problem as seeking a portfolio with the highest volatility, sub...  
URL: https://arxiv.org/abs/2402.08108

**2. Inference for an Algorithmic Fairness-Accuracy Frontier**  
作者: Yiqi Liu,Francesca Molinari  
摘要: Decision-making processes increasingly rely on the use of algorithms. Yet, algorithms' predictive ability frequently exhibit systematic variation across subgroups of the population. While both fairnes...  
URL: https://arxiv.org/abs/2402.08879

**3. Doubly Robust Inference in Causal Latent Factor Models**  
作者: Alberto Abadie,Anish Agarwal,Raaz Dwivedi,Abhin Shah  
摘要: This article introduces a new estimator of average treatment effects under unobserved confounding in modern data-rich environments featuring large numbers of units and outcomes. The proposed estimator...  
URL: https://arxiv.org/abs/2402.11652

## hep-ph (高能物理-现象学)

**1. Improvement and generalization of ABCD method with Bayesian inference**  
作者: Ezequiel Alvarez,Leandro Da Rold,Manuel Szewc,Alejandro Szynkman,Santiago A. Tanco,Tatiana Tarutina  
摘要: To find New Physics or to refine our knowledge of the Standard Model at the LHC is an enterprise that involves many factors. We focus on taking advantage of available information and pour our effort i...  
URL: https://arxiv.org/abs/2402.08001

**2. A Language Model for Particle Tracking**  
作者: Andris Huang,Yash Melkani,Paolo Calafiura,Alina Lazar,Daniel Thomas Murnane,Minh-Tuan Pham,Xiangyang Ju  
摘要: Particle tracking is crucial for almost all physics analysis programs at the Large Hadron Collider. Deep learning models are pervasively used in particle tracking related tasks. However, the current p...  
URL: https://arxiv.org/abs/2402.10239

**3. PASCL: Supervised Contrastive Learning with Perturbative Augmentation for Particle Decay Reconstruction**  
作者: Junjian Lu,Siwei Liu,Dmitrii Kobylianski,Etienne Dreyer,Eilam Gross,Shangsong Liang  
摘要: In high-energy physics, particles produced in collision events decay in a format of a hierarchical tree structure, where only the final decay products can be observed using detectors. However, the lar...  
URL: https://arxiv.org/abs/2402.11538

**4. A case study of sending graph neural networks back to the test bench for applications in high-energy particle physics**  
作者: Emanuel Pfeffer,Michael Waßmer,Yee-Ying Cung,Roger Wolf,Ulrich Husemann  
摘要: In high-energy particle collisions, the primary collision products usually decay further resulting in tree-like, hierarchical structures with a priori unknown multiplicity. At the stable-particle leve...  
URL: https://arxiv.org/abs/2402.17386

## physics.comp-ph (计算物理)

**1. Cartesian atomic cluster expansion for machine learning interatomic potentials**  
作者: Bingqing Cheng  
摘要: Machine learning interatomic potentials are revolutionizing large-scale, accurate atomistic modelling in material science and chemistry. Many potentials use atomic cluster expansion or equivariant mes...  
URL: https://arxiv.org/abs/2402.07472

**2. Neural Networks Asymptotic Behaviours for the Resolution of Inverse Problems**  
作者: Luigi Del Debbio,Manuel Naviglio,Francesco Tarantelli  
摘要: This paper presents a study of the effectiveness of Neural Network (NN) techniques for deconvolution inverse problems relevant for applications in Quantum Field Theory, but also in more general contex...  
URL: https://arxiv.org/abs/2402.09338

**3. Universal Machine Learning Kohn-Sham Hamiltonian for Materials**  
作者: Yang Zhong,Hongyu Yu,Jihui Yang,Xingyu Guo,Hongjun Xiang,Xingao Gong  
摘要: While density functional theory (DFT) serves as a prevalent computational approach in electronic structure calculations, its computational demands and scalability limitations persist. Recently, levera...  
URL: https://arxiv.org/abs/2402.09251

**4. Differentiability in Unrolled Training of Neural Physics Simulators on Transient Dynamics**  
作者: Bjoern List,Li-Wei Chen,Kartik Bali,Nils Thuerey  
摘要: Unrolling training trajectories over time strongly influences the inference accuracy of neural network-augmented physics simulators. We analyze this in three variants of training neural time-steppers....  
URL: https://arxiv.org/abs/2402.12971

**5. Thermodynamics-informed super-resolution of scarce temporal dynamics data**  
作者: Carlos Bermejo-Barbanoj,Beatriz Moya,Alberto Badías,Francisco Chinesta,Elías Cueto  
摘要: We present a method to increase the resolution of measurements of a physical system and subsequently predict its time evolution using thermodynamics-aware neural networks. Our method uses adversarial ...  
URL: https://arxiv.org/abs/2402.17506

**6. Beacon, a lightweight deep reinforcement learning benchmark library for flow control**  
作者: Jonathan Viquerat,Philippe Meliga,Pablo Jeken,Elie Hachem  
摘要: Recently, the increasing use of deep reinforcement learning for flow control problems has led to a new area of research, focused on the coupling and the adaptation of the existing algorithms to the co...  
URL: https://arxiv.org/abs/2402.17402

## cs.CC (计算复杂度)

**1. Nearest Neighbor Representations of Neural Circuits**  
作者: Kordag Mehmet Kilic,Jin Sima,Jehoshua Bruck  
摘要: Neural networks successfully capture the computational power of the human brain for many tasks. Similarly inspired by the brain architecture, Nearest Neighbor (NN) representations is a novel approach ...  
URL: https://arxiv.org/abs/2402.08751

**2. Nearest Neighbor Representations of Neurons**  
作者: Kordag Mehmet Kilic,Jin Sima,Jehoshua Bruck  
摘要: The Nearest Neighbor (NN) Representation is an emerging computational model that is inspired by the brain. We study the complexity of representing a neuron (threshold function) using the NN representa...  
URL: https://arxiv.org/abs/2402.08748

**3. On Computability of Computable Problems**  
作者: Asad Khaliq  
摘要: Computational problems are classified into computable and uncomputable problems. If there exists an effective procedure (algorithm) to compute a problem then the problem is computable otherwise it is ...  
URL: https://arxiv.org/abs/2402.09410

**4. Computational complexity of the Weisfeiler-Leman dimension**  
作者: Moritz Lichter,Simon Raßmann,Pascal Schweitzer  
摘要: The Weisfeiler-Leman dimension of a graph $G$ is the least number $k$ such that the $k$-dimensional Weisfeiler-Leman algorithm distinguishes $G$ from every other non-isomorphic graph. The dimension is...  
URL: https://arxiv.org/abs/2402.11531

**5. Alphabet Reduction for Reconfiguration Problems**  
作者: Naoto Ohsaka  
摘要: We present a reconfiguration analogue of alphabet reduction à la Dinur (J. ACM, 2007) and its applications. Given a binary constraint graph $G$ and its two satisfying assignments $ψ^\mathsf{ini}$ and ...  
URL: https://arxiv.org/abs/2402.10627

**6. Optimal PSPACE-hardness of Approximating Set Cover Reconfiguration**  
作者: Shuichi Hirahara,Naoto Ohsaka  
摘要: In the Minmax Set Cover Reconfiguration problem, given a set system $\mathcal{F}$ over a universe and its two covers $\mathcal{C}^\mathsf{start}$ and $\mathcal{C}^\mathsf{goal}$ of size $k$, we wish t...  
URL: https://arxiv.org/abs/2402.12645

**7. Improved Hardness Results for Learning Intersections of Halfspaces**  
作者: Stefan Tiegel  
摘要: We show strong (and surprisingly simple) lower bounds for weakly learning intersections of halfspaces in the improper setting. Strikingly little is known about this problem. For instance, it is not ev...  
URL: https://arxiv.org/abs/2402.15995

## q-bio.MN (分子网络)

**1. Computing Threshold Circuits with Void Reactions in Step Chemical Reaction Networks**  
作者: Rachel Anderson,Alberto Avila,Bin Fu,Timothy Gomez,Elise Grizzell,Aiden Massie,Gourab Mukhopadhyay,Adrian Salinas,Robert Schweller,Evan Tomai,Tim Wylie  
摘要: We introduce a new model of \emph{step} Chemical Reaction Networks (step CRNs), motivated by the step-wise addition of materials in standard lab procedures. Step CRNs have ordered reactants that trans...  
URL: https://arxiv.org/abs/2402.08220

## cs.OS (操作系统)

**1. A System-Level Dynamic Binary Translator using Automatically-Learned Translation Rules**  
作者: Jinhu Jiang,Chaoyi Liang,Rongchao Dong,Zhaohui Yang,Zhongjun Zhou,Wenwen Wang,Pen-Chung Yew,Weihua Zhang  
摘要: System-level emulators have been used extensively for system design, debugging and evaluation. They work by providing a system-level virtual machine to support a guest operating system (OS) running on...  
URL: https://arxiv.org/abs/2402.09688

## physics.app-ph (应用物理)

**1. Deep learning for the design of non-Hermitian topolectrical circuits**  
作者: Xi Chen,Jinyang Sun,Xiumei Wang,Hengxuan Jiang,Dandan Zhu,Xingping Zhou  
摘要: Non-Hermitian topological phases can produce some remarkable properties, compared with their Hermitian counterpart, such as the breakdown of conventional bulk-boundary correspondence and the non-Hermi...  
URL: https://arxiv.org/abs/2402.09978

## cs.PL (编程语言)

**1. Solving Data-centric Tasks using Large Language Models**  
作者: Shraddha Barke,Christian Poelitz,Carina Suzana Negreanu,Benjamin Zorn,José Cambronero,Andrew D. Gordon,Vu Le,Elnaz Nouri,Nadia Polikarpova,Advait Sarkar,Brian Slininger,Neil Toronto,Jack Williams  
摘要: Large language models (LLMs) are rapidly replacing help forums like StackOverflow, and are especially helpful for non-professional programmers and end users. These users are often interested in data-c...  
URL: https://arxiv.org/abs/2402.11734

**2. LLMDFA: Analyzing Dataflow in Code with Large Language Models**  
作者: Chengpeng Wang,Wuqi Zhang,Zian Su,Xiangzhe Xu,Xiaoheng Xie,Xiangyu Zhang  
摘要: Dataflow analysis is a fundamental code analysis technique that identifies dependencies between program values. Traditional approaches typically necessitate successful compilation and expert customiza...  
URL: https://arxiv.org/abs/2402.10754

**3. Sixth International Workshop on Languages for Modelling Variability (MODEVAR 2024)**  
作者: Jessie Galasso-Carbonnel,Chico Sundermann  
摘要: This is the proceedings of the Sixth International Workshop on Languages for Modelling Variability (MODEVAR 2024) which was held at Bern, Switzerland, February 06th 2024.  
URL: https://arxiv.org/abs/2402.15511

**4. Weak-linearity, globality and in-place update**  
作者: Hector Gramaglia  
摘要: Computational interpretations of linear logic allow static control of memory resources: the data produced by the program are endowed through its type with attributes that determine its life cycle. Thi...  
URL: https://arxiv.org/abs/2402.16534

## econ.TH (理论经济学)

**1. The Value of Context: Human versus Black Box Evaluators**  
作者: Andrei Iakovlev,Annie Liang  
摘要: Machine learning algorithms are now capable of performing evaluations previously conducted by human experts (e.g., medical diagnoses). How should we conceptualize the difference between evaluation by ...  
URL: https://arxiv.org/abs/2402.11157

**2. Reputational Algorithm Aversion**  
作者: Gregory Weitzner  
摘要: People are often reluctant to incorporate information produced by algorithms into their decisions, a phenomenon called ``algorithm aversion''. This paper shows how algorithm aversion arises when the c...  
URL: https://arxiv.org/abs/2402.15418

## astro-ph.EP (地球和行星天体物理学)

**1. DBNets: A publicly available deep learning tool to measure the masses of young planets in dusty protoplanetary discs**  
作者: Alessandro Ruzza,Giuseppe Lodato,Giovanni Pietro Rosotti  
摘要: Current methods to characterize embedded planets in protoplanetary disc observations are severely limited either in their ability to fully account for the observed complex physics or in their computat...  
URL: https://arxiv.org/abs/2402.12448

**2. Computing Transiting Exoplanet Parameters with 1D Convolutional Neural Networks**  
作者: Santiago Iglesias Álvarez,Enrique Díez Alonso,María Luisa Sánchez Rodríguez,Javier Rodríguez Rodríguez,Saúl Pérez Fernández,Francisco Javier de Cos Juez  
摘要: The transit method allows the detection and characterization of planetary systems by analyzing stellar light curves. Convolutional neural networks appear to offer a viable solution for automating thes...  
URL: https://arxiv.org/abs/2402.13673

## astro-ph.GA (星系天体物理学)

**1. Emulating the interstellar medium chemistry with neural operators**  
作者: Lorenzo Branca,Andrea Pallottini  
摘要: Galaxy formation and evolution critically depend on understanding the complex photo-chemical processes that govern the evolution and thermodynamics of the InterStellar Medium (ISM). Computationally, s...  
URL: https://arxiv.org/abs/2402.12435

## astro-ph.HE (高能天体物理现象)

**1. Toward using GANs in astrophysical Monte-Carlo simulations**  
作者: Ahab Isaac,Wesley Armour,Karel Adámek  
摘要: Accurate modelling of spectra produced by X-ray sources requires the use of Monte-Carlo simulations. These simulations need to evaluate physical processes, such as those occurring in accretion process...  
URL: https://arxiv.org/abs/2402.12396

## math.AT (代数拓扑)

**1. Mixup Barcodes: Quantifying Geometric-Topological Interactions between Point Clouds**  
作者: Hubert Wagner,Nickolas Arustamyan,Matthew Wheeler,Peter Bubenik  
摘要: We combine standard persistent homology with image persistent homology to define a novel way of characterizing shapes and interactions between them. In particular, we introduce: (1) a mixup barcode, w...  
URL: https://arxiv.org/abs/2402.15058

## physics.ins-det (仪器仪表和探测器)

**1. Portable acceleration of CMS computing workflows with coprocessors as a service**  
作者: CMS Collaboration  
摘要: Computing demands for large scientific experiments, such as the CMS experiment at the CERN LHC, will increase dramatically in the next decades. To complement the future performance increases of softwa...  
URL: https://arxiv.org/abs/2402.15366

## cond-mat.supr-con (超导)

**1. Scalable Superconductor Neuron with Ternary Synaptic Connections for Ultra-Fast SNN Hardware**  
作者: Mustafa Altay Karamuftuoglu,Beyza Zeynep Ucpinar,Arash Fayyazi,Sasan Razmkhah,Mehdi Kamal,Massoud Pedram  
摘要: A novel high-fan-in differential superconductor neuron structure designed for ultra-high-performance Spiking Neural Network (SNN) accelerators is presented. Utilizing a high-fan-in neuron structure al...  
URL: https://arxiv.org/abs/2402.16384

## nlin.AO (适应和自组织系统)

**1. Predicting Instability in Complex Oscillator Networks: Limitations and Potentials of Network Measures and Machine Learning**  
作者: Christian Nauck,Michael Lindner,Nora Molkenthin,Jürgen Kurths,Eckehard Schöll,Jörg Raisch,Frank Hellmann  
摘要: A central question of network science is how functional properties of systems arise from their structure. For networked dynamical systems, structure is typically quantified with network measures. A fu...  
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