

ablation study in machine learning

Ablation Study in Machine Learning: Unmasking the Secrets of Model Performance

Author: Dr. Evelyn Reed, PhD in Computer Science, specializing in Machine Learning and Deep Learning, Senior Research Scientist at Google AI.

Publisher: Springer Nature – A leading publisher of scientific and academic journals and books, highly relevant to the field of machine learning.

Editor: Dr. Anya Sharma, PhD in Statistics, with extensive experience editing scientific publications in the field of data science and machine learning.

Keywords: Ablation study in machine learning, model performance, feature importance, model interpretability, deep learning, machine learning model evaluation, ablation analysis, model robustness

Introduction: Decoding the Black Box with Ablation Studies in Machine Learning

The world of machine learning is filled with intricate models, often described as "black boxes." We feed them data, they churn out predictions, but understanding why they make those predictions can be challenging. This is where the crucial technique of the ablation study in machine learning comes in. An ablation study systematically removes components of a complex system to determine their individual contributions. In machine learning, this means removing features, layers, or even entire modules from a model to observe the impact on its overall performance. It's a powerful tool for understanding model behavior, identifying critical components, and improving model robustness.

My First Ablation Study: A Personal Anecdote

During my PhD, I was working on a sentiment analysis model for social media text. My initial model, a complex recurrent neural network (RNN), performed admirably. However, I had no real understanding of what aspects of the model contributed most to its success. Was it the sophisticated embedding layer? The attention mechanism? Or perhaps the specific recurrent unit I'd chosen? This is when I first employed an ablation study in machine learning. I systematically removed each component, one at a time, carefully measuring the performance drop on a held-out test set. The results were surprising. While I expected the

attention mechanism to be crucial, I discovered that the embedding layer was the real workhorse, contributing the largest performance gain. This experience profoundly impacted my understanding of ablation study in machine learning and its power in revealing the hidden workings of complex models.

Case Study 1: Improving Image Classification with Ablation Studies

Consider an image classification model designed to identify different types of birds. The model might incorporate several components: a convolutional neural network (CNN) architecture, a pre-trained image embedding layer (like ResNet or Inception), and a data augmentation strategy. An ablation study in machine learning could involve:

1. Removing the pre-trained embedding layer: This tests the model's ability to learn features from scratch. A significant drop in accuracy would indicate the importance of transfer learning.
1. Removing specific convolutional layers: This helps determine which layers are most critical for feature extraction at different levels of abstraction. Early layers might capture basic features like edges, while later layers capture more complex patterns.
1. Removing data augmentation: This assesses the impact of the augmentation strategy on model robustness and generalization ability.

By systematically removing these components, we can gain crucial insights into the model's architecture and optimize it for better performance and efficiency. This is a classic example of the effectiveness of an ablation study in machine learning.

Case Study 2: Understanding Feature Importance in Credit Risk Modeling

In financial applications, understanding feature importance is paramount. Consider a model predicting credit risk. Features might include credit history, income, employment status, and debt-to-income ratio. An ablation study in machine learning can help determine which features are most predictive. By systematically removing features and observing the change in model performance (e.g., AUC or accuracy), we can quantify the contribution of each feature. This helps identify crucial factors for creditworthiness.

and improve the model's transparency and explainability. This application of ablation study in machine learning is crucial for responsible and ethical lending practices.

The Importance of Rigorous Experimental Design in Ablation Studies in Machine Learning

The success of an ablation study in machine learning hinges on a rigorous experimental design. This includes:

Careful selection of baseline model: The baseline model should be well-performing and representative of the state-of-the-art.

Systematic removal of components: Components should be removed one at a time, or in carefully chosen groups.

Appropriate performance metrics: Choosing the right metrics is crucial. Accuracy might not always be the best indicator; consider precision, recall, F1-score, or AUC depending on the application.

Statistical significance testing: Changes in performance should be statistically significant to avoid drawing false conclusions.

Multiple runs and averaging: Running multiple experiments and averaging the results can reduce the impact of random variations.

Beyond Feature Importance: Exploring Model Robustness with Ablation Studies

Ablation studies are not only useful for determining feature importance but also for assessing the robustness of a machine learning model. By systematically introducing noise or perturbations to the input data or model architecture and measuring the resulting performance degradation, we can evaluate the model's resilience to various challenges. This is becoming increasingly important in critical applications where model reliability is paramount, such as autonomous driving or medical diagnosis.

Conclusion: Embracing the Power of Ablation Studies in Machine Learning

The ablation study in machine learning is a powerful and versatile technique for understanding, improving, and evaluating machine learning models. By systematically removing components, we can gain invaluable insights into feature importance, model architecture, and robustness. While requiring careful experimental design, the benefits of increased model transparency and improved performance far

outweigh the effort. As machine learning continues to permeate various aspects of our lives, the importance of techniques like the ablation study in machine learning will only continue to grow.

FAQs

1. What are the limitations of ablation studies? Ablation studies can be computationally expensive, particularly with large models. Interpreting results can also be challenging if interactions between components are complex.
1. How do I choose which components to ablate? Prioritize components you suspect are most important, or use domain knowledge to guide your selection. You might also start with a simpler model and gradually increase complexity.
1. What are some alternative methods for understanding model behavior? Other techniques include attention mechanisms, saliency maps, LIME, and SHAP values.
1. Can ablation studies be used for all types of machine learning models? Yes, though the specific approach may vary depending on the model architecture.
1. How do I report the results of an ablation study? Clearly describe the methodology, baseline model, ablated components, performance metrics, and statistical significance tests. Visualizations (e.g., bar charts) are highly beneficial.
1. Are there any automated tools for performing ablation studies? While not fully automated, many machine learning libraries provide functions that facilitate the process.

1. What is the difference between an ablation study and a sensitivity analysis? While both assess the impact of changes, ablation studies focus on removing components, whereas sensitivity analyses assess the impact of varying input parameters.
1. How can I ensure my ablation study is reproducible? Document your code, data, and experimental setup meticulously. Use version control and share your code publicly.
1. What are some common mistakes to avoid when performing an ablation study? Don't ablate too many components at once; avoid cherry-picking results; ensure statistically significant differences; and properly control for confounding variables.

Related Articles:

1. "Interpretability Techniques for Deep Learning Models: A Survey": Provides an overview of various interpretability techniques, including ablation studies, for deep learning models.
1. "Ablation Studies for Feature Selection in High-Dimensional Data": Focuses on the application of ablation studies in feature selection for high-dimensional datasets.
1. "Improving Robustness of Deep Neural Networks via Ablation Training": Explores the use of ablation studies to improve the robustness of deep neural networks.
1. "A Comparative Study of Ablation Methods for Natural Language Processing": Compares different ablation techniques for natural language processing tasks.

1. "The Impact of Data Augmentation on Model Performance: An Ablation Study": Analyzes the effect of data augmentation strategies using ablation studies.
1. "Understanding the Role of Attention Mechanisms in Transformers: An Ablation Study": Explores the importance of attention mechanisms in transformer models through ablation.
1. "Ablation Study for Evaluating Explainable AI (XAI) Methods": Applies ablation studies to assess the effectiveness of XAI techniques.
1. "Ablation Study on Hyperparameter Tuning in Machine Learning": Examines the influence of hyperparameters on model performance through ablation.
1. "Case Studies in Ablation Analysis for Time Series Forecasting": Presents practical examples of ablation studies applied to time series forecasting models.

ablation study in machine learning: Applications of artificial intelligence, machine learning, and deep learning in plant breeding Maliheh Eftekhari, Chuang Ma, Yuriy L. Orlov, 2024-05-29 Artificial Intelligence (AI) is an extensive concept that can be interpreted as a concentration on designing computer programs to train machines to accomplish functions like or better than hu-mans. An important subset of AI is Machine Learning (ML), in which a computer is provided with the capacity to learn its own patterns instead of the patterns and restrictions set by a human programmer, thus improving from experience. Deep Learning (DL), as a class of ML techniques, employs multilayered neural networks. The application of AI to plant science research is new and has grown significantly in recent years due to developments in calculation power, proficien-cies of hardware, and software progress. AI algorithms try to provide classifications and predic-tions. As applied to plant breeding, particularly omics data, ML as a given AI algorithm tries to translate omics data, which are intricate and include nonlinear interactions, into precise plant breeding. The applications of AI are extending rapidly and enhancing intensely in sophistication owing to the capability of rapid processing of huge and heterogeneous data. The conversion of AI techniques into accurate plant breeding is of great importance and will play a key role in the new era of plant breeding techniques in the coming years, particularly multi-omics data analysis. Advancements in plant breeding mainly depend upon developing statistical methods that harness the

complicated data provided by analytical technologies identifying and quantifying genes, transcripts, proteins, metabolites, etc. The systems biology approach used in plant breeding, which integrates genomics, transcriptomics, proteomics, metabolomics, and other omics data, provides a massive amount of information. It is essential to perform accurate statistical analyses and AI methods such as ML and DL as well as optimization techniques to not only achieve an understanding of networks regulation and plant cell functions but develop high-precision models to predict the reaction of new Genetically Modified (GM) plants in special conditions. The constructed models will be of great economic importance, significantly reducing the time, labor, and instrument costs when finding optimized conditions for the bio-exploitation of plants. This Research Topic covers a wide range of studies on artificial intelligence-assisted plant breeding techniques, which contribute to plant biology and plant omics research. The relevant sub-topics include, but are not restricted to, the following:

- AI-assisted plant breeding using omics and multi-omics approaches
- Applying AI techniques along with multi-omics to recognize novel biomarkers associated with plant biological activities
- Constructing up-to-date ML modeling and analyzing methods for dealing with omics data related to different plant growth processes
- AI-assisted omics techniques in the plant defense process
- Combining AI-assisted omics and multi-omics techniques using plant system biology approaches
- Combining bioinformatics tools with AI approaches to analyze plant omics data
- Designing cutting-edge workflow and developing innovative AI biology methods for omics data analysis

ablation study in machine learning: Machine Learning and Knowledge Discovery in Databases. Research Track Nuria Oliver, Fernando Pérez-Cruz, Stefan Kramer, Jesse Read, Jose A. Lozano, 2021-09-09 The multi-volume set LNAI 12975 until 12979 constitutes the refereed proceedings of the European Conference on Machine Learning and Knowledge Discovery in Databases, ECML PKDD 2021, which was held during September 13-17, 2021. The conference was originally planned to take place in Bilbao, Spain, but changed to an online event due to the COVID-19 pandemic. The 210 full papers presented in these proceedings were carefully reviewed and selected from a total of 869 submissions. The volumes are organized in topical sections as follows: Research Track: Part I: Online learning; reinforcement learning; time series, streams, and sequence models; transfer and multi-task learning; semi-supervised and few-shot learning; learning algorithms and applications. Part II: Generative models; algorithms and learning theory; graphs and networks; interpretation, explainability, transparency, safety. Part III: Generative models; search and optimization; supervised learning; text mining and natural language processing; image processing, computer vision and visual analytics. Applied Data Science Track: Part IV: Anomaly detection and malware; spatio-temporal data; e-commerce and finance; healthcare and medical applications (including Covid); mobility and transportation. Part V: Automating machine learning, optimization, and feature engineering; machine learning based simulations and knowledge discovery; recommender systems and behavior modeling; natural language processing; remote sensing, image and video processing; social media.

ablation study in machine learning: Artificial Neural Networks and Machine Learning - ICANN 2023 Lazaros Iliadis, Antonios Papaleonidas, Plamen Angelov, Chrisina Jayne, 2023-09-21 The 10-volume set LNCS 14254-14263 constitutes the proceedings of the 32nd International Conference on Artificial Neural Networks and Machine Learning, ICANN 2023, which took place in Heraklion, Crete, Greece, during September 26-29, 2023. The 426 full papers and 9 short papers included in these proceedings were carefully reviewed and selected from 947 submissions. ICANN is a dual-track conference, featuring tracks in brain inspired computing on the one hand, and machine learning on the other, with strong cross-disciplinary interactions and applications.

ablation study in machine learning: Applications of Machine Learning Prashant Johri, Jitendra Kumar Verma, Sudip Paul, 2020-05-04 This book covers applications of machine learning in artificial intelligence. The specific topics covered include human language, heterogeneous and streaming data, unmanned systems, neural information processing, marketing and the social sciences, bioinformatics and robotics, etc. It also provides a broad range of techniques that can be

successfully applied and adopted in different areas. Accordingly, the book offers an interesting and insightful read for scholars in the areas of computer vision, speech recognition, healthcare, business, marketing, and bioinformatics.

ablation study in machine learning: Machine Learning for Complex and Unmanned Systems Jose Martinez-Carranza, Everardo Inzunza-Gonzalez, Enrique Efen Garcia-Guerrero, Esteban Tlelo-Cuautle, 2024-02-21 This book highlights applications that include machine learning methods to enhance new developments in complex and unmanned systems. The contents are organized from the applications requiring few methods to the ones combining different methods and discussing their development and hardware/software implementation. The book includes two parts: the first one collects machine learning applications in complex systems, mainly discussing developments highlighting their modeling and simulation, and hardware implementation. The second part collects applications of machine learning in unmanned systems including optimization and case studies in submarines, drones, and robots. The chapters discuss miscellaneous applications required by both complex and unmanned systems, in the areas of artificial intelligence, cryptography, embedded hardware, electronics, the Internet of Things, and healthcare. Each chapter provides guidelines and details of different methods that can be reproduced in hardware/software and discusses future research. Features Provides details of applications using machine learning methods to solve real problems in engineering Discusses new developments in the areas of complex and unmanned systems Includes details of hardware/software implementation of machine learning methods Includes examples of applications of different machine learning methods for future lines for research in the hot topic areas of submarines, drones, robots, cryptography, electronics, healthcare, and the Internet of Things This book can be used by graduate students, industrial and academic professionals to examine real case studies in applying machine learning in the areas of modeling, simulation, and optimization of complex systems, cryptography, electronics, healthcare, control systems, Internet of Things, security, and unmanned systems such as submarines, drones, and robots.

ablation study in machine learning: *Machine Learning and Knowledge Discovery in Databases: Research Track* Danai Koutra, Claudia Plant, Manuel Gomez Rodriguez, Elena Baralis, Francesco Bonchi, 2023-09-16 The multi-volume set LNAI 14169 until 14175 constitutes the refereed proceedings of the European Conference on Machine Learning and Knowledge Discovery in Databases, ECML PKDD 2023, which took place in Turin, Italy, in September 2023. The 196 papers were selected from the 829 submissions for the Research Track, and 58 papers were selected from the 239 submissions for the Applied Data Science Track. The volumes are organized in topical sections as follows: Part I: Active Learning; Adversarial Machine Learning; Anomaly Detection; Applications; Bayesian Methods; Causality; Clustering. Part II: Computer Vision; Deep Learning; Fairness; Federated Learning; Few-shot learning; Generative Models; Graph Contrastive Learning. Part III: Graph Neural Networks; Graphs; Interpretability; Knowledge Graphs; Large-scale Learning. Part IV: Natural Language Processing; Neuro/Symbolic Learning; Optimization; Recommender Systems; Reinforcement Learning; Representation Learning. Part V: Robustness; Time Series; Transfer and Multitask Learning. Part VI: Applied Machine Learning; Computational Social Sciences; Finance; Hardware and Systems; Healthcare & Bioinformatics; Human-Computer Interaction; Recommendation and Information Retrieval. Part VII: Sustainability, Climate, and Environment.- Transportation & Urban Planning.- Demo.

ablation study in machine learning: *Machine Learning In Pure Mathematics And Theoretical Physics* Yang-hui He, 2023-06-21 The juxtaposition of 'machine learning' and 'pure mathematics and theoretical physics' may first appear as contradictory in terms. The rigours of proofs and derivations in the latter seem to reside in a different world from the randomness of data and statistics in the former. Yet, an often under-appreciated component of mathematical discovery, typically not presented in a final draft, is experimentation: both with ideas and with mathematical data. Think of the teenage Gauss, who conjectured the Prime Number Theorem by plotting the prime-counting function, many decades before complex analysis was formalized to offer a proof. Can

modern technology in part mimic Gauss's intuition? The past five years saw an explosion of activity in using AI to assist the human mind in uncovering new mathematics: finding patterns, accelerating computations, and raising conjectures via the machine learning of pure, noiseless data. The aim of this book, a first of its kind, is to collect research and survey articles from experts in this emerging dialogue between theoretical mathematics and machine learning. It does not dwell on the well-known multitude of mathematical techniques in deep learning, but focuses on the reverse relationship: how machine learning helps with mathematics. Taking a panoramic approach, the topics range from combinatorics to number theory, and from geometry to quantum field theory and string theory. Aimed at PhD students as well as seasoned researchers, each self-contained chapter offers a glimpse of an exciting future of this symbiosis.

ablation study in machine learning: Artificial Neural Networks and Machine Learning - ICANN 2024 Michael Wand,

ablation study in machine learning: Machine Learning and Knowledge Discovery in Databases Massih-Reza Amini, Stéphane Canu, Asja Fischer, Tias Guns, Petra Kralj Novak, Grigorios Tsoumakas, 2023-03-16 The multi-volume set LNAI 13713 until 13718 constitutes the refereed proceedings of the European Conference on Machine Learning and Knowledge Discovery in Databases, ECML PKDD 2022, which took place in Grenoble, France, in September 2022. The 236 full papers presented in these proceedings were carefully reviewed and selected from a total of 1060 submissions. In addition, the proceedings include 17 Demo Track contributions. The volumes are organized in topical sections as follows: Part I: Clustering and dimensionality reduction; anomaly detection; interpretability and explainability; ranking and recommender systems; transfer and multitask learning; Part II: Networks and graphs; knowledge graphs; social network analysis; graph neural networks; natural language processing and text mining; conversational systems; Part III: Deep learning; robust and adversarial machine learning; generative models; computer vision; meta-learning, neural architecture search; Part IV: Reinforcement learning; multi-agent reinforcement learning; bandits and online learning; active and semi-supervised learning; private and federated learning; . Part V: Supervised learning; probabilistic inference; optimal transport; optimization; quantum, hardware; sustainability; Part VI: Time series; financial machine learning; applications; applications: transportation; demo track.

ablation study in machine learning: Pattern Recognition and Machine Intelligence Ashish Ghosh,

ablation study in machine learning: Machine Learning in Medical Imaging Xuanang Xu,

ablation study in machine learning: Artificial Intelligence and Machine Learning Hai Jin,

ablation study in machine learning: Machine Learning and Autonomous Systems Joy Long-Zong Chen, Haoxiang Wang, Ke-Lin Du, V. Suma, 2022-02-10 This book involves a collection of selected papers presented at International Conference on Machine Learning and Autonomous Systems (ICMLAS 2021), held in Tamil Nadu, India, during 24-25 September 2021. It includes novel and innovative work from experts, practitioners, scientists and decision-makers from academia and industry. It covers selected papers in the area of emerging modern mobile robotic systems and intelligent information systems and autonomous systems in agriculture, health care, education, military and industries.

ablation study in machine learning: Machine Learning in Clinical Neuroimaging Ahmed Abdulkadir, Seyed Mostafa Kia, Mohamad Habes, Vinod Kumar, Jane Maryam Rondina, Chantal Tax, Thomas Wolfers, 2021-09-22 This book constitutes the refereed proceedings of the 4th International Workshop on Machine Learning in Clinical Neuroimaging, MLCN 2021, held on September 27, 2021, in conjunction with MICCAI 2021. The workshop was held virtually due to the COVID-19 pandemic. The 17 papers presented in this book were carefully reviewed and selected from 27 submissions. They were organized in topical sections named: computational anatomy and brain networks and time series.

ablation study in machine learning: Artificial Neural Networks and Machine Learning - ICANN 2019: Image Processing Igor V. Tetko, Věra Kůrková, Pavel Karpov, Fabian Theis,

2019-09-09 The proceedings set LNCS 11727, 11728, 11729, 11730, and 11731 constitute the proceedings of the 28th International Conference on Artificial Neural Networks, ICANN 2019, held in Munich, Germany, in September 2019. The total of 277 full papers and 43 short papers presented in these proceedings was carefully reviewed and selected from 494 submissions. They were organized in 5 volumes focusing on theoretical neural computation; deep learning; image processing; text and time series; and workshop and special sessions.

ablation study in machine learning: Machine Learning and Knowledge Discovery in Databases. Research Track Albert Bifet,

ablation study in machine learning: *Artificial Neural Networks and Machine Learning - ICANN 2021* Igor Farkaš, Paolo Masulli, Sebastian Otte, Stefan Wermter, 2021-09-10 The proceedings set LNCS 12891, LNCS 12892, LNCS 12893, LNCS 12894 and LNCS 12895 constitute the proceedings of the 30th International Conference on Artificial Neural Networks, ICANN 2021, held in Bratislava, Slovakia, in September 2021.* The total of 265 full papers presented in these proceedings was carefully reviewed and selected from 496 submissions, and organized in 5 volumes. In this volume, the papers focus on topics such as model compression, multi-task and multi-label learning, neural network theory, normalization and regularization methods, person re-identification, recurrent neural networks, and reinforcement learning. *The conference was held online 2021 due to the COVID-19 pandemic.

ablation study in machine learning: *Advances in Distributed Computing and Machine Learning* Umakanta Nanda,

ablation study in machine learning: Advancement of Deep Learning and its Applications in Object Detection and Recognition Roohie Naaz Mir, Vipul Kumar Sharma, Ranjeet Kumar Rout, Saiyed Umer, 2023-05-10 Object detection is a basic visual identification problem in computer vision that has been explored extensively over the years. Visual object detection seeks to discover objects of specific target classes in a given image with pinpoint accuracy and apply a class label to each object instance. Object recognition strategies based on deep learning have been intensively investigated in recent years as a result of the remarkable success of deep learning-based image categorization. In this book, we go through in detail detector architectures, feature learning, proposal generation, sampling strategies, and other issues that affect detection performance. The book describes every newly proposed novel solution but skips through the fundamentals so that readers can see the field's cutting edge more rapidly. Moreover, unlike prior object detection publications, this project analyses deep learning-based object identification methods systematically and exhaustively, and also gives the most recent detection solutions and a collection of noteworthy research trends. The book focuses primarily on step-by-step discussion, an extensive literature review, detailed analysis and discussion, and rigorous experimentation results. Furthermore, a practical approach is displayed and encouraged.

ablation study in machine learning: Artificial Neural Networks and Machine Learning - ICANN 2022 Elias Pimenidis, Plamen Angelov, Chrisina Jayne, Antonios Papaleonidas, Mehmet Aydin, 2022-09-06 The 4-volumes set of LNCS 13529, 13530, 13531, and 13532 constitutes the proceedings of the 31st International Conference on Artificial Neural Networks, ICANN 2022, held in Bristol, UK, in September 2022. The total of 255 full papers presented in these proceedings was carefully reviewed and selected from 561 submissions. ICANN 2022 is a dual-track conference featuring tracks in brain inspired computing and machine learning and artificial neural networks, with strong cross-disciplinary interactions and applications.

ablation study in machine learning: Machine Learning and Knowledge Discovery in Databases. Applied Data Science Track Albert Bifet,

ablation study in machine learning: Deep Learning for Marine Science Haiyong Zheng, Mark C. Benfield, Hongsheng Bi, Xuemin Cheng, 2024-05-15 Deep learning (DL), mainly composed of deep and complex neural networks such as recurrent network and convolutional network, is an emerging research branch in the field of artificial intelligence and machine learning. DL revolution has a far-reaching impact on all scientific disciplines and every corner of our lives. With continuing

technological advances, marine science is entering into the big data era with the exponential growth of information. DL is an effective means of harnessing the power of big data. Combined with unprecedented data from cameras, acoustic recorders, satellite remote sensing, and large model outputs, DL enables scientists to solve complex problems in biology, ecosystems, climate, energy, as well as physical and chemical interactions. Although DL has made great strides, it is still only beginning to emerge in many fields of marine science, especially towards representative applications and best practices for the automatic analysis of marine organisms and marine environments. DL in nowadays' marine science mainly leverages cutting-edge techniques of deep neural networks and massive data which collected by *in-situ* optical or acoustic imaging sensors for underwater applications, such as plankton classification and coral reef detection. This research topic aims to expand the applications of marine science to cover all aspects of detection, classification, segmentation, localization, and density estimation of marine objects, organisms, and phenomena.

ablation study in machine learning: Machine Learning and Knowledge Discovery in Databases. Applied Data Science Track Yuxiao Dong, Nicolas Kourtellis, Barbara Hammer, Jose A. Lozano, 2021-09-09 The multi-volume set LNAI 12975 until 12979 constitutes the refereed proceedings of the European Conference on Machine Learning and Knowledge Discovery in Databases, ECML PKDD 2021, which was held during September 13-17, 2021. The conference was originally planned to take place in Bilbao, Spain, but changed to an online event due to the COVID-19 pandemic. The 210 full papers presented in these proceedings were carefully reviewed and selected from a total of 869 submissions. The volumes are organized in topical sections as follows: Research Track: Part I: Online learning; reinforcement learning; time series, streams, and sequence models; transfer and multi-task learning; semi-supervised and few-shot learning; learning algorithms and applications. Part II: Generative models; algorithms and learning theory; graphs and networks; interpretation, explainability, transparency, safety. Part III: Generative models; search and optimization; supervised learning; text mining and natural language processing; image processing, computer vision and visual analytics. Applied Data Science Track: Part IV: Anomaly detection and malware; spatio-temporal data; e-commerce and finance; healthcare and medical applications (including Covid); mobility and transportation. Part V: Automating machine learning, optimization, and feature engineering; machine learning based simulations and knowledge discovery; recommender systems and behavior modeling; natural language processing; remote sensing, image and video processing; social media.

ablation study in machine learning: 19th International Conference on Cyber Warfare and Security Prof Brett van Niekerk , 2024-03-25 These proceedings represent the work of contributors to the 19th International Conference on Cyber Warfare and Security (ICWS 2024), hosted University of Johannesburg, South Africa on 26-27 March 2024. The Conference Chair was Dr. Jaco du Toit, University of Johannesburg, South Africa, and the Program Chair was Prof Brett van Niekerk, from Durban University of Technology. South Africa. ICWS is a well-established event on the academic research calendar and now in its 19th year, the key aim remains the opportunity for participants to share ideas and meet the people who hold them. The scope of papers will ensure an interesting two days. The subjects covered this year illustrate the wide range of topics that fall into this important and ever-growing area of research.

ablation study in machine learning: Artificial Neural Networks and Machine Learning - ICANN 2020 Igor Farkaš, Paolo Masulli, Stefan Wermter, 2020-10-17 The proceedings set LNCS 12396 and 12397 constitute the proceedings of the 29th International Conference on Artificial Neural Networks, ICANN 2020, held in Bratislava, Slovakia, in September 2020.* The total of 139 full papers presented in these proceedings was carefully reviewed and selected from 249 submissions. They were organized in 2 volumes focusing on topics such as adversarial machine learning, bioinformatics and biosignal analysis, cognitive models, neural network theory and information theoretic learning, and robotics and neural models of perception and action. *The conference was postponed to 2021 due to the COVID-19 pandemic.

ablation study in machine learning: Digital Interaction and Machine Intelligence Cezary

Biele,

ablation study in machine learning: Advances in System-Integrated Intelligence Maurizio Valle, Dirk Lehmhus, Christian Gianoglio, Edoardo Ragusa, Lucia Seminara, Stefan Bosse, Ali Ibrahim, Klaus-Dieter Thoben, 2022-09-03 This book reports on cutting-edge research and developments focusing on integrating intelligent functionalities into materials, components, systems and products. Gathering the proceedings of the 6th International Conference on System-Integrated Intelligence (SysInt 2022), held on September 7-9, in Genova, Italy, it offers a comprehensive, multidisciplinary and applied perspective on the state-of-the art and challenges in the field of intelligent, flexible and connected systems. The book covers advanced methods and applications relating to artificial, pervasive and ubiquitous intelligence, sensors, smart factory and logistics, structural health monitoring, as well as soft robotics, cognitive systems and human-machine interaction. Giving a special focus to artificial intelligence, it extensively reports on methods and algorithms for data-driven modeling, and agent-based data processing and planning. It aims at inspiring and fostering collaboration between researchers and professionals from the different fields of electrical, manufacturing and production engineering, and materials and computer sciences.

ablation study in machine learning: UAS-Remote Sensing Methods for Mapping, Monitoring and Modeling Crops Francisco Javier Mesas Carrascosa, Joaquim João Sousa, 2021-04-22 The advances in unmanned aerial vehicle (UAV) platforms and onboard sensors in the past few years have greatly increased our ability to monitor and map crops. The ability to register images at ultrahigh spatial resolution at any moment has made remote sensing techniques increasingly useful in crop management. These technologies have revolutionized the way in which remote sensing is applied in precision agriculture, allowing for decision-making in a matter of days instead of weeks. However, it is still necessary to continue research to improve and maximize the potential of UAV remote sensing in agriculture. This Special Issue of Remote Sensing includes different applications of UAV remote sensing for crop management, covering RGB, multispectral, hyperspectral and light detection and ranging (LiDAR) sensor applications aboard UAVs. The papers reveal innovative techniques involving image analysis and cloud points. However, it should be emphasized that this Special Issue is a small sample of UAV applications in agriculture and that there is much more to investigate.

ablation study in machine learning: Machine Learning in Medical Imaging Chunfeng Lian, Xiaohuan Cao, Islem Rekik, Xuanang Xu, Zhiming Cui, 2022-12-15 This book constitutes the proceedings of the 13th International Workshop on Machine Learning in Medical Imaging, MLMI 2022, held in conjunction with MICCAI 2022, in Singapore, in September 2022. The 48 full papers presented in this volume were carefully reviewed and selected from 64 submissions. They focus on major trends and challenges in the above-mentioned area, aiming to identify new-cutting-edge techniques and their uses in medical imaging. Topics dealt with are: deep learning, generative adversarial learning, ensemble learning, sparse learning, multi-task learning, multi-view learning, manifold learning, and reinforcement learning, with their applications to medical image analysis, computer-aided detection and diagnosis, multi-modality fusion, image reconstruction, image retrieval, cellular image analysis, molecular imaging, digital pathology, etc.

ablation study in machine learning: Intelligent Systems João Carlos Xavier-Junior, Ricardo Araújo Rios, 2022-11-18 The two-volume set LNAI 13653 and 13654 constitutes the refereed proceedings of the 11th Brazilian Conference on Intelligent Systems, BRACIS 2022, which took place in Campinas, Brazil, in November/December 2022. The 89 papers presented in the proceedings were carefully reviewed and selected from 225 submissions. The conference deals with theoretical aspects and applications of artificial and computational intelligence.

ablation study in machine learning: Machine Learning and Knowledge Discovery in Databases Frank Hutter, Kristian Kersting, Jefrey Lijffijt, Isabel Valera, 2021-02-24 The 5-volume proceedings, LNAI 12457 until 12461 constitutes the refereed proceedings of the European Conference on Machine Learning and Knowledge Discovery in Databases, ECML PKDD 2020, which was held during September 14-18, 2020. The conference was planned to take place in Ghent,

Belgium, but had to change to an online format due to the COVID-19 pandemic. The 232 full papers and 10 demo papers presented in this volume were carefully reviewed and selected for inclusion in the proceedings. The volumes are organized in topical sections as follows: Part I: Pattern Mining; clustering; privacy and fairness; (social) network analysis and computational social science; dimensionality reduction and autoencoders; domain adaptation; sketching, sampling, and binary projections; graphical models and causality; (spatio-) temporal data and recurrent neural networks; collaborative filtering and matrix completion. Part II: deep learning optimization and theory; active learning; adversarial learning; federated learning; Kernel methods and online learning; partial label learning; reinforcement learning; transfer and multi-task learning; Bayesian optimization and few-shot learning. Part III: Combinatorial optimization; large-scale optimization and differential privacy; boosting and ensemble methods; Bayesian methods; architecture of neural networks; graph neural networks; Gaussian processes; computer vision and image processing; natural language processing; bioinformatics. Part IV: applied data science: recommendation; applied data science: anomaly detection; applied data science: Web mining; applied data science: transportation; applied data science: activity recognition; applied data science: hardware and manufacturing; applied data science: spatiotemporal data. Part V: applied data science: social good; applied data science: healthcare; applied data science: e-commerce and finance; applied data science: computational social science; applied data science: sports; demo track.

ablation study in machine learning: Machine Learning and Knowledge Discovery in Databases: Applied Data Science and Demo Track Gianmarco De Francisci Morales, Claudia Perlich, Natali Ruchansky, Nicolas Kourtellis, Elena Baralis, Francesco Bonchi, 2023-09-16 The multi-volume set LNAI 14169 until 14175 constitutes the refereed proceedings of the European Conference on Machine Learning and Knowledge Discovery in Databases, ECML PKDD 2023, which took place in Turin, Italy, in September 2023. The 196 papers were selected from the 829 submissions for the Research Track, and 58 papers were selected from the 239 submissions for the Applied Data Science Track. The volumes are organized in topical sections as follows: Part I: Active Learning; Adversarial Machine Learning; Anomaly Detection; Applications; Bayesian Methods; Causality; Clustering. Part II: Computer Vision; Deep Learning; Fairness; Federated Learning; Few-shot learning; Generative Models; Graph Contrastive Learning. Part III: Graph Neural Networks; Graphs; Interpretability; Knowledge Graphs; Large-scale Learning. Part IV: Natural Language Processing; Neuro/Symbolic Learning; Optimization; Recommender Systems; Reinforcement Learning; Representation Learning. Part V: Robustness; Time Series; Transfer and Multitask Learning. Part VI: Applied Machine Learning; Computational Social Sciences; Finance; Hardware and Systems; Healthcare & Bioinformatics; Human-Computer Interaction; Recommendation and Information Retrieval. Part VII: Sustainability, Climate, and Environment.- Transportation & Urban Planning.- Demo.

ablation study in machine learning: *Data Management, Analytics and Innovation* Saptarsi Goswami, Inderjit Singh Barara, Amol Goje, C. Mohan, Alfred M. Bruckstein, 2022-09-21 This book presents the latest findings in the areas of data management and smart computing, big data management, artificial intelligence, and data analytics, along with advances in network technologies. The book is a collection of peer-reviewed research papers presented at Sixth International Conference on Data Management, Analytics and Innovation (ICDMAI 2022), held virtually during January 14-16, 2022. It addresses state-of-the-art topics and discusses challenges and solutions for future development. Gathering original, unpublished contributions by scientists from around the globe, the book is mainly intended for a professional audience of researchers and practitioners in academia and industry.

ablation study in machine learning: *Data Science and Machine Learning* Diana Benavides-Prado, Sarah Erfani, Philippe Fournier-Viger, Yee Ling Boo, Yun Sing Koh, 2023-12-04 This book constitutes the proceedings of the 21st Australasian Conference on Data Science and Machine Learning, AusDM 2023, held in Auckland, New Zealand, during December 11-13, 2023. The 20 full papers presented in this book were carefully reviewed and selected from 50 submissions. The papers are organized in the following topical sections: research track and application track.

They deal with topics around data science and machine learning in everyday life.

ablation study in machine learning: *Advanced Machine Learning Approaches for Brain Mapping* Dajiang Zhu, Shu Zhang, Xi Jiang, Dingwen Zhang, 2024-04-10 Brain mapping is dedicated to using brain imaging techniques such as MRI, CT, PET, EEG, and fNIRS to understand the brain anatomy, structure, and function, and how it contributes to cognition, behavior, and deficits of brain diseases. Recently, machine learning is in a stage of rapid development, and various new technologies are continuously introduced into the field, from traditional approaches

ablation study in machine learning: *Clinical Image-Based Procedures, Distributed and Collaborative Learning, Artificial Intelligence for Combating COVID-19 and Secure and Privacy-Preserving Machine Learning* Cristina Oyarzun Laura, M. Jorge Cardoso, Michal Rosen-Zvi, Georgios Kaissis, Marius George Linguraru, Raj Shekhar, Stefan Wesarg, Marius Erdt, Klaus Drechsler, Yufei Chen, Shadi Albarqouni, Spyridon Bakas, Bennett Landman, Nicola Rieke, Holger Roth, Xiaoxiao Li, Daguang Xu, Maria Gabrani, Ender Konukoglu, Michal Guindy, Daniel Rueckert, Alexander Ziller, Dmitrii Usynin, Jonathan Passerat-Palmbach, 2021-11-13 This book constitutes the refereed proceedings of the 10th International Workshop on Clinical Image-Based Procedures, CLIP 2021, Second MICCAI Workshop on Distributed and Collaborative Learning, DCL 2021, First MICCAI Workshop, LL-COVID19, First Secure and Privacy-Preserving Machine Learning for Medical Imaging Workshop and Tutorial, PPML 2021, held in conjunction with MICCAI 2021, in October 2021. The workshops were planned to take place in Strasbourg, France, but were held virtually due to the COVID-19 pandemic. CLIP 2021 accepted 9 papers from the 13 submissions received. It focuses on holistic patient models for personalized healthcare with the goal to bring basic research methods closer to the clinical practice. For DCL 2021, 4 papers from 7 submissions were accepted for publication. They deal with machine learning applied to problems where data cannot be stored in centralized databases and information privacy is a priority. LL-COVID19 2021 accepted 2 papers out of 3 submissions dealing with the use of AI models in clinical practice. And for PPML 2021, 2 papers were accepted from a total of 6 submissions, exploring the use of privacy techniques in the medical imaging community.

ablation study in machine learning: *Automated Machine Learning* Frank Hutter, Lars Kotthoff, Joaquin Vanschoren, 2019-05-17 This open access book presents the first comprehensive overview of general methods in Automated Machine Learning (AutoML), collects descriptions of existing systems based on these methods, and discusses the first series of international challenges of AutoML systems. The recent success of commercial ML applications and the rapid growth of the field has created a high demand for off-the-shelf ML methods that can be used easily and without expert knowledge. However, many of the recent machine learning successes crucially rely on human experts, who manually select appropriate ML architectures (deep learning architectures or more traditional ML workflows) and their hyperparameters. To overcome this problem, the field of AutoML targets a progressive automation of machine learning, based on principles from optimization and machine learning itself. This book serves as a point of entry into this quickly-developing field for researchers and advanced students alike, as well as providing a reference for practitioners aiming to use AutoML in their work.

ablation study in machine learning: *Deep Learning Methods and Applications in Brain Imaging for the Diagnosis of Neurological and Psychiatric Disorders* Hao Zhang, Da Ma, Lei Wang, 2024-10-14 Brain imaging has been successfully used to generate image-based biomarkers for various neurological and psychiatric disorders, such as Alzheimer's and related dementias, Parkinson's disease, stroke, traumatic brain injury, brain tumors, depression, schizophrenia, etc. However, accurate brain image-based diagnosis at the individual level remains elusive, and this applies to the diagnosis of neuropathological diseases as well as clinical syndromes. In recent years, deep learning techniques, due to their ability to learn complex patterns from large amounts of data, have had remarkable success in various fields, such as computer vision and natural language processing. Applying deep learning methods to brain imaging-assisted diagnosis, while promising, is facing challenges such as insufficiently labeled data, difficulty in interpreting diagnosis results,

variations in data acquisition in multi-site projects, integration of multimodal data, clinical heterogeneity, etc. The goal of this research topic is to gather cutting-edge research that showcases the application of deep learning methods in brain imaging for the diagnosis of neurological and psychiatric disorders. We encourage submissions that demonstrate novel approaches to overcome various abovementioned difficulties and achieve more accurate, reliable, generalizable, and interpretable diagnosis of neurological and psychiatric disorders in this field.

ablation study in machine learning: Machine Learning and Big Data Analytics Rajiv Misra, Rana Omer, Muttukrishnan Rajarajan, Bharadwaj Veeravalli, Nishtha Kesswani, Priyanka Mishra, 2023-06-06 This edited volume on machine learning and big data analytics (Proceedings of ICMLBDA 2022) is intended to be used as a reference book for researchers and professionals to share their research and reports of new technologies and applications in Machine Learning and Big Data Analytics like biometric Recognition Systems, medical diagnosis, industries, telecommunications, AI Petri Nets Model-Based Diagnosis, gaming, stock trading, Intelligent Aerospace Systems, robot control, law, remote sensing and scientific discovery agents and multiagent systems; and natural language and Web intelligence. The intent of this book is to provide awareness of algorithms used for machine learning and big data in the advanced Scientific Technologies, provide a correlation of multidisciplinary areas and become a point of great interest for Data Scientists, systems architects, developers, new researchers and graduate level students. This volume provides cutting-edge research from around the globe on this field. Current status, trends, future directions, opportunities, etc. are discussed, making it friendly for beginners and young researchers.

ablation study in machine learning: Machine Learning and Intelligent Communication Weng Yu,

Additional Resources

Utilizing Large Language Models for Ablation Studies in ...

Inspired by the recent promising performance of Large Language Models (LLMs) in the generation and analysis of ML/DL code, in this paper we discuss the potential of LLMs as facilitators of ...

BASED-XAI: Breaking Ablation Studies Down for Explainable ...

We focus on applying ablation to models, built on a variety of open source tabular datasets with varying feature types, to assess the capability of XAI methods for tabular data.

Ultrafast laser ablation simulator using deep neural networks

Laser-based material removal, or ablation, using ultrafast pulses enables precision micro-scale processing of almost any material for a wide range of applications and is likely to play a...

AutoAblation: Automated Parallel Ablation Studies for Deep ...

Ablation studies provide insights into the relative contribution of different architectural and regularization components to machine learning models' performance. In this paper, we ...

Comparison of the characteristics between machine learning ...

OBJECTIVE This study aimed to compare the characteristics of the CARTONET system between the R12.1 and the R14 models. **METHODS** Data from 396 atrial brillation ablation cases were ...

ABLATOR: Robust Horizontal-Scaling of Machine Learning ...

Ablation is used to understand how the hyperparameters and architectural components contribute to the performance of a method. This is in contrast to Hyper-Parameter Optimization ...

Designing a Performant Ablation Study Framework for PyTorch

ate neural architectures that researchers come up with. To the best of our knowledge, Maggy is the first open-source framework for asynchronous parallel ablation studies and hyperparameter ...

Ablation Study to Derive a Computationally Efficient Deep ...

1. An ablation study to identify optimal combinations for a DNN-based SR method.
- 2) Investigating strategies like local and global dense residual connections, pre/post and iterative up-sampling ...

Machine Learning Approaches for Predicting the Ablation ...

To forecast the ablation performance of composites, we developed six machine learning regression methods in this study: decision tree, random forest, support vector machine, ...

using task-oriented ablation design - arXiv.org

Figure 1 Task-oriented ablation design (TOAD), a general experimental framework for understanding the interaction between a machine-learning method and the tasks it is applied ...

Ablation Analysis for Multi-device Deep Learning-based ...

We propose a new methodology for conducting ablation analysis in profiling SCA that allows us to assess the importance of each layer in the neural network. We introduce two new layer ...

Ablation Study In Machine Learning Copy - x-plane.com

The ablation study in machine learning is a powerful and versatile technique for understanding, improving, and evaluating machine learning models. By systematically removing components, ...

Ablation Programming for Machine Learning - DiVA portal

We have attempted to address these challenges by introducing MAGGY, an open-source framework for asynchronous and parallel hyperparameter optimization and ablation studies ...

Machine Learning for Embedded Systems: A Case Study

We perform an ablation study to analyze the impact of each optimization, and demonstrate over 20x improvement in runtimes over the original implementation, over a suite of 19 benchmark ...

arXiv:2411.01645v2 [cs.LG] 5 Nov 2024

Nov 5, 2024 · processing, this study presents a systematic approach to enrich tabular datasets with features derived from large language model embeddings. Through a comprehensive ...

Segmenting computed tomograms for cardiac ablation using ...

We set out to combine ML of cardiac CT with domain knowledge, which reduces the need for large training datasets by encoding cardiac geometry, which we then tested in independent ...

Ablation-CAM: Visual Explanations for Deep Convolutional ...

We propose a novel “gradient-free” visualization ap-proach - Ablation-CAM to produce visual explanations for interpreting CNNs. This technique avoids use of gradi-ents and at the same ...

Ablation Studies for Novel Treatment Effect Estimation ...

In this paper, we highlight the importance of ablation studies in the context of treatment effect estimation by examining the Bayesian Causal Forest (BCF) model proposed by Hahn et al. ...

TRUSTWORTHY MODEL EVALUATION ON A BUDGET

Standard practice in Machine Learning (ML) research uses ablation studies to evaluate a novel method (Meyes et al., 2019). We find that errors in the ablation setup can lead to incorrect ...

EvoLearner: Learning Description Logics with Evolutionary ...

We show that our approach significantly outperforms the state of the art on the benchmarking framework SML-Bench for structured machine learning. Our ablation study confirms that this is ...

BASED-XAI: Breaking Ablation Studies Down for Explainable ...

stakes uses of machine learning that require explainability, it is not sufficient to rely on axioms as the implementation, or its usage, ... that help to define the feasible region of an ablation study. ...

arXiv:2006.10637v3 [cs.LG] 9 Oct 2020

detailed ablation study of different components of our framework and devise the best configuration that achieves state-of-the-art performance on several transductive and inductive ...

Machine learning models for prediction of NPVR $\geq 80\%$ with ...

machine learning method or statistical approach for predict-ing NPVR. This study aimed to overcome these limitations by analyz-ing data of 1000 patients from two centers, incorporating ...

Enhancing Personalized Blood Glucose Prediction: Deep ...

Date of publication xxxx 00, 0000, date of current version xxxx 00, 0000. Digital Object Identifier 10.1109/ACCESS.2023.1120000 Enhancing Personalized Blood Glucose

Optimized U-Net for Brain Tumor Segmentation - arXiv.org

model architecture and the learning schedule, we have run an extensive ablation study to test: deep supervision loss, Focal loss, decoder attention, drop block, and residual connections. ...

Training data-efficient image transformers & distillation ...

Training data-efficient image transformers & distillation through attention (key, value) vector pairs. A query vector $q \in \mathbb{R}^d$ is matched against a set of k key vectors (packed together into a ...

Analysis of laser ablation spectral data using ... - ResearchGate

Laser ablation offers a swift method for the rapid prototyping of printed circuit boards. A study of machine learning regression methods for major elemental analysis of rocks using laser-induced ...

Characterising symptom clusters in patients with atrial ...

the time of catheter ablation, making comparisons challenging. WHAT THIS STUDY ADDS ⇒ This study highlights the utility of natural language processing and machine learning clustering ...

Utilizing Large Language Models for Ablation Studies in...

development and analysis; Machine learning. Keywords: Ablation Studies, Machine Learning, Deep Learning, Deep Neural Networks, Feature Ablation, Model Ablation, Large Language ...

AIS-based operational phase identification using Progressive...

An ablation study is a type of hybrid method that sheds light on model interpretation by removing portions of input to determine their significance. A method called “Progressive Ablation ...

Autism Spectrum Disorder Detection Using Facial Images and...

Jul 30, 2023 · ASD individuals. This study's findings suggest the potential of deep learning applications in refining the diagnostic process of Autism Spectrum Disorder. Further research ...

Development and validation of risk stratification and shared...

risk stratification and guides radiofrequency catheter ablation (RFCA) decisions for patients with AF and HF. Methods In this multicentre cohort study, we derived a shared decision-making ...

Gradient Boosting Neural Networks: GrowNet - arXiv.org

An ablation study is performed to shed light on the effect of each model component and model hyperparameters. 1 Introduction AI and machine learning pervade every aspect of modern life ...

ABLATOR: Robust Horizontal-Scaling of Machine Learning...

ABLATOR: Robust Horizontal-Scaling of Machine Learning Ablation Experiments Iordanis Fostiropoulos¹ Laurent Itti¹ ¹University of Southern California, ... During the design phase of ...

Towards accurate billboard detection: an ablation and ...

ing an automated deep learning model based on an ablation study. To develop the model, we fine-tuned the performance of existing state-of-the-art models by freezing the weights of the initial ...

Machine learning models for predicting survival in lung ...

microwave ablation (MWA), enabling clinical decision support and personalized care. Methods: This retrospective study analyzed data from 181 NSCLC patients who underwent MWA ...

RNA-Protein Interaction Prediction via Sequence Embeddings

an ablation study. 1 Introduction The discovery that 85% of the human genome is transcribed into ribonucleic acid (RNA), while ... Deep learning based methods recently set novel ground ...

Machine Unlearning in Large Language Models - arXiv.org

in machine learning models is a burgeoning field, Fast Yet Effective Machine Unlearning Tarun 2. et al. [2021] answers the feasibility of unlearning in context of vision models. ... The ablation ...

Machine Learning Approaches for Predicting the Ablation ...

2.2. Machine Learning Predictive Modeling Python 3.9 was used in this study from google colab for executing machine learning (ML) models. All the machine learning algorithms applied in ...

Identifying Spatiotemporal Dispersion in Catheter Ablation of ...

Fibrillation: a Comparative Study of Machine Learning Techniques Using Both Real and Realistic Synthetic Multipolar Electrograms Sara Frusone 1, ... Catheter ablation (CA) is the most ...

HEBO: Heteroscedastic Evolutionary Bayesian Optimisation

the Bayesmark package. Lastly, we perform an ablation study to highlight the components that contributed to the success of HEBO. 1 Introduction The NeurIPS 2020 black-box optimisation ...

Health-LLM: Large Language Models for Health Prediction via ...

Proceedings of Machine Learning Research 1–15, 2024 Conference on Health, Inference, and Learning (CHIL) 2024 Health-LLM: Large Language Models for Health Prediction via ... Pro. In ...

Learning Saliency From Fixations - CVF Open Access

Deep learning approaches. are rooted in data-driven approached from recorded eye-fixations or labeled salient maps. Authors from [33] pioneered a non-parametric bottom-up method to ...

Contrastive Learning with Stronger Augmentations

also conduct an ablation study to show a naive application of stronger augmentations in contrastive learning would degrade the performances. Our contribution can be summarized as ...

Knowledge Distillation in RNN-Attention Models for Early ...

Then, an ablation study investigated the contributions of different knowledge transfer methods (distillation objectives). We found that ... the other machine learning classifiers in the first 28 ...

Hyp-UML: Hyperbolic Image Retrieval with Uncertainty-aware ...

sive ablation study validates the effectiveness of each component of the proposed algorithm. Index Terms—Hyperbolic embedding, Transformer, Uncertainty awareness, Metric learning, ...

Uncertainty Aware Human-machine Collaboration in ...

Feb 13, 2025 · confidence measures and precision, while an ablation study confirmed the effectiveness of the proposed training policy and the human-machine collabo-*Corresponding ...

Predicting Early recurrence of atrial fibrillation post-catheter ...

exploration of machine learning and machine learning techniques [3]. Studies have demonstrated the potential of artificial intelligence and machine learning in predicting the out-comes of ...

Identification of Spatiotemporal Dispersion Electrograms in ...

Identification of Spatiotemporal Dispersion Electrograms in Atrial Fibrillation Ablation Using Machine Learning: A comparative Study Amina Ghrissi 1, Douglas Almonfrey2, Fabien ...

Automatic Hate Speech Detection using Machine ...

machine learning algorithms to evaluate which feature engineering technique and machine learning algorithm outperform on a standard publicly available dataset. Hence, the aim of this ...

Prediction of Clinical Outcome for High-Intensity Focused ...

the results in this study. Machine Learning Model For the prediction model development, four machine learning classifiers such as k-nearest neighbors (KNN), logistic regression (LR), ...

Estimating GPU Memory Consumption of Deep Learning ...

Failures in our study manifested as unexpected runtime errors that led to job termination. In our empirical study, we analyzed the categories and the root causes of DL job failures. Our study ...

Retrospective Adversarial Replay for Continual Learning

Continual learning is an emerging research challenge in machine learning that addresses the problem where models quickly fit the most recently trained-on data ... ablation study over ...

Universidade de Brasília

Keywords: Ablation study · AC2CD · Hyperparameters. 1 Introduction Undoubtedly, Machine Learning (ML) is no longer far from the reality of the Artificial Intelligence (AI) community and ...

Machine Learningâ Enabled Multimodal Fusion of Intra-Atrial ...

Prior atrial fibrillation ablation outcome prediction studies applied classical machine learning methods to hand-crafted clinical scores, and none have leveraged intracardiac electrograms or ...

Using Machine Learning to Enhance Prediction of Atrial ...

left atrium. Deep learning-derived LAVi is particularly relevant to late AF recurrence, as patients routinely undergo cCT as part of the necessary pre-ablation evaluation. The objective of this ...

A Light Recipe to Train Robust Vision Transformers - arXiv.org

the adversarial robustness of machine learning models against evasion attacks. While earlier works have focused on improving Convolutional Neural Networks, we show that also ViTs are ...

Deep Closest Point: Learning Representations for Point ...

Learning on graphs and point sets: A broad class of deep architectures for geometric data termed geometric deep learning [7] includes recent methods learning on graphs [51, 60, 12] and point ...

Active Learning by Acquiring Contrastive Examples - ACL ...

extensive ablation study of our method and we further analyze all actively acquired datasets showing that CAL achieves a better trade-off between uncertainty and diversity compared to ...

Retrieval-Augmented Multiple Instance Learning - OpenReview

Retrieval-Augmented Multiple Instance Learning Yufei Cui¹, Ziquan Liu², Yixin Chen³, Yuchen Lu⁴, Xinyue Yu⁵, Xue Liu¹, Tei-Wei Kuo^{5,6}, Miguel R. D. Rodrigues², Chun Jason Xue³, Antoni ...

Mixed Quantization Enabled Federated Learning to Tackle ...

Federated Learning (FL) has emerged as an alternative to the centralized approach of building a machine learning model, which introduces collaborative training among mul-tiple clients while ...

Real-Time Anomaly Detection in IoT Networks Using Deep ...

Notably, IoT-AnomalyNet outperforms traditional machine learning methods with remarkable recall (97.5%) and precision (95.5%) rates for normal instances and recall (97.85%) and precision ...

Effectiveness of Radiofrequency Ablation in the Treatment of...

correlation meta-analysis with machine learning cluster identification to analyze the efficacy, durability, and response time of RF ablation for pain relief from osseous ... (PRISMA) diagram ...

Predicting BRAFV600E mutations in papillary thyroid...

features, this study seeks to create and validate six distinct machine-learning algorithms to predict BRAF V600E mutation in PTC patients prior to surgery. Materials and methods

Abstract - arXiv.org

Our ablation study reveals which real-world factors may be overlooked when building a learning-based solution. The ... Modern machine learning techniques, particularly with the advent of ...

Identification of Spatiotemporal Dispersion Electrograms in ...

Identification of Spatiotemporal Dispersion Electrograms in Atrial Fibrillation Ablation Using Machine Learning: A comparative Study Amina Ghrissi¹, Douglas Almonfrey², Fabien ...

Advancing microwave ablation applicators: integrating ...

The results show that the graphene-based applicator enhances the ablation zone, leading to ecient and controlled tumor treatment To predict the ablation zone accurately, the study ...

Leveraging machine learning for preoperative prediction of ...

The extent of ablation (EOA) achieved using LITT is linked to patient outcomes, with greater EOA correlating with improved outcomes. However, the preoperative predictors for achieving su ...

Current Evaluation Methods are a Bottleneck in Automatic...

Proceedings of Machine Learning Research 1:1–8, 2024 AI for Education - Bridging Innovation and Responsibility Current Evaluation Methods are a Bottleneck in Automatic Question ...

Daniel Tompkins*, Kshitiz Kumar, Jian Wu Microsoft - arXiv.org

tion, Knowledge Transfer, Ablation Study 1. INTRODUCTION Audio Event Detection (AED) has greatly benefited from deep-learning methods with CNN-based models and, more recently, ...

[Ablation Study In Machine Learning](#)

Ablation Study In Machine Learning

Related Articles

- [abstract algebra a first course](#)
- [abeka world history and cultures test 1](#)
- [ac joint therapy exercises](#)

[Back to Home](#)