

Course title

Analysis of artificial intelligence applications in improving the
efficiency of computer systems

Material symbol: AI800

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Summary research paper's

Paper1 : A study on enhancing operating systems performance using artificial intelligence

A study titled "enhancing operating systems performance with AI: Optimized scheduling and resource management" explored the role of artificial intelligence in improving operating system performance through intelligent resource management and process scheduling. The study aimed to address the efficiency challenges faced by traditional scheduling techniques when dealing with variable loads in modern systems, it employed machine learning algorithms , particularly reinforcement learning and neural networks , to predict system loads and dynamically allocate resources, the results demonstrated that using artificial intelligence leads to improved CPU utilization , reduced response times , and increased energy efficiency compared to traditional methods.

Paper2: A study on the use of Artificial intelligence in improving industrial processes

The study,"harnessing artificial intelligence for optimum performance in industrial automation" explored the application of artificial intelligence (AI) technologies within industrial systems to enhance operational performance , the study aimed to analyze the role of deep learning and machine learning algorithms in increasing production efficiency and improving the accuracy and flexibility of industrial processes, the study employed an analytical review methodology and case studies in various industrial environments , the results demonstrated that the use of AI in industrial automation contributes to increased productivity , reduced errors, and improved process monitoring , ultimately leading to higher operational efficiency in factories.

Paper 3: A study on optimizing electrical control systems using artificial intelligence

The study, "optimize electric automation control using artificial intelligence", addressed the design of an electrical control system based on artificial intelligence algorithms to improve the performance of automated systems, the study aimed to develop control model capable of reducing interference and improving system response speed, artificial intelligence algorithms were used optimize the control parameters of the electrical system, the results showed that the proposed system possesses high interference resistance, reduces the failure rate, and improves production efficiency , confirming the effectiveness artificial intelligence in enhancing the performance of industrial systems.

Paper 4: A study on improving energy system efficiency using artificial intelligence

The study, "artificial intelligence for energy optimization in smart buildings", explored the role of artificial intelligence in improving energy consumption within smart building, the study aimed to evaluate the effectiveness of AI algorithms in energy management and waste reduction, it relied on a systematic analysis of numerous previous studies to classify AI technologies used in energy management, such as reinforcement learning and supervised learning, the results showed that some algorithms , particularly reinforcement learning, achieved energy savings of over 20% in several applications, reflecting their ability to improve the efficiency of smart system.

Paper 5: A study on enhancing industrial process performance using artificial intelligence models

The study, "enhancing critical industrial processes with artificial intelligence models", explored the use of artificial intelligence models to improve critical industrial processes in a smart industry environment, the study aimed to analyze how techniques such as machine learning, deep learning, and reinforcement learning can be used to monitor processes and predict failures, the study employed a scientific review methodology examining several applied research studies in the manufacturing and energy sectors, the results demonstrated that application of artificial intelligence can reduce system downtime and enhance data-driven decision – making, leading to improved overall performance of industrial systems.

Paper 6: A study on improving system efficiency using machine learning algorithms

The study, " machine learning algorithms: A comparative study on effectiveness", compared a range of machine learning algorithms used to improve system efficiency and analyze data. The study aimed to evaluate the performance of different algorithms in terms of accuracy, efficiency , and the ability to process complex data. The study employed an experimental approach using multiple evaluation methods, the findings demonstrated that using advanced machine learning algorithms can improve system efficiency and increase the accuracy of prediction and decision – making compared to traditional methods.

Critical analysis:

Analysis of previous studies on AI applications in improving system efficiency reveals that these studies have made significant contributions to highlighting the ability of AI technologies, such as machine learning, reinforcement learning, and neural networks, to enhance the performance of various systems, industrial systems, and energy systems, a key strength of these studies is their reliance experimental models and advanced algorithms, which have contributed to improved resource management, fault prediction, and operational efficiency, some studies have also been comprehensive, analyzing large number of practical applications across multiple fields. However, some weaknesses are also noted. Several studies relied on simulated environments or literature reviews rather than real – world application data, which may limit the generalizability of the findings to real – world settings, furthermore , the limited size or diversity of data in some studies ,may effect the accuracy of the conclusions drawn, therefore , it can be conclusions drawn, therefore, it can be concluded that the research methodologies used, despite their diversity – ranging from experimental approaches to literature reviews – require further support through the use of real data extensive field experiments to enhance the reliability of AI applications in improving system efficiency.

Correlations and contradictions among research paper findings

Research paper findings demonstrate high degree of consistency in confirming that artificial intelligence (AI) applications significantly contribute to improving that efficiency of various systems by enhancing resource management, increasing the accuracy of fault predication, and boosting operational performance in areas such as operating systems, industrial systems, and energy systems,

Most studies agree that using machine learning and deep learning algorithms leads to improved resource utilization and reduced operational errors, thus enhancing overall system performance.

However, some discrepancies emerge among the study findings in terms of effectiveness and practical applicability , some experimental studies report tangible efficiency improvements based on applied models and practical teste, while others rely on literature reviews or simulations environments, making their results more theoretical less generalizable to real – world settings, furthermore , some studies focus on specific technical aspects such as control algorithms or energy management, while others address broader AI applications areas and leads to relative differences in findings and conclusions, in general, there are no fundamental contradictions between the results of the studies; rather, they show complementarity in highlighting the increasing role of artificial intelligence in improving the efficiency of systems.

Summary of research papers :

Study title	Year of publication	authors	Methodology used	results	Weaknesses and limitations
Improving operating system performance using artificial intelligence	2021	Smith et al	An experimental approach using reinforcement learning algorithms and neural networks to improve process scheduling	Improve processing unit utilization, reduce response time, and increase resource management efficiency	Relying on a simulation environment more than realistic applications
The use of artificial intelligence in industrial automation	2022	Kumar & Patel	Analytical review and case studies of artificial intelligence applications in factories	Increase productivity reduce errors, and improve the accuracy processes	Lack of quantitative data and direct applied experiments
Improving electrical control systems with artificial intelligence	2022	Zhang et al	An experimental approach to developing an intelligent control model using machine learning algorithms	Improve system responsiveness, reduce the impact of noise, and increase operational efficiency	Limited experimental data and system testing within a limited scope
Improving energy efficiency in smart buildings	2023	Garcia et al	A systematic review of the literature on artificial intelligence techniques in energy management	Reducing energy consumption and improving resource management in smart buildings	Relying on previous studies rather than direct operational data
Improving industrial processes using artificial intelligence models	2023	Lee & Chin	Analysis of scientific literature on the use of machine learning in predictive maintenance	Reducing system downtime and improving decision – making industrial processes	Lack of long – term applied studies
Comparing machine learning algorithms to improve system efficiency	2020	Ahmed et al	An experimental approach to comparing the performance of several machine learning algorithms using training and testing data	Improving the accuracy of prediction and decision – making in data – driven systems	Limited diversity of data used in the test

Conclusion :

The conclusion drawn from the review and analysis of research papers indicates that artificial intelligence (AI) Technologies have become an effective tool for improving system efficiency in various fields, such as operating systems, industrial system efficiency in various fields, such as operating systems, industrial systems, and energy management, most studies have shown that the use of machine learning, deep learning and reinforcement learning algorithms contributes to improved resource management, reduced operational errors and fault predication, leading to enhanced system performance and operational efficiency.

The results also revealed a general consensus among the studies regarding the positive impact of enhancing performance and improving decision – making processes.

References:

1. Ahmad , khan , m , & ali , r (2020) , machine learning algorithms: a comparative study on efficiency and effectiveness, journal of artificial intelligence and machine learning.
2. Smith , j , brown , t , & Williams , r (2021), enhancing operating system performance with artificial intelligence: optimized scheduling and resource management. International journal of artificial intelligence and machine learning.
3. kumar , a & patel , s (2022) , harnessing artificial intelligence for optimum performance in industrial automation , journal of industrial engineering and automation.
4. zhang , y , liu h & chen x (2022) . optimization of electric automation control using artificial intelligence , optik – international journal for light and electron optics.
5. Garcia L , Rodriguez m . & torres , p (2023) artificial intelligence for energy optimization in smart building : a systemic review , energy informatics.
6. lee , j & chen k (2023) enhancing critical industrial processes with artificial intelligence models , proceeding of engineering and industrial technology research.