Transformative Synergy: Machine Learning and Neural Networks in Environmental Science

Betania Rahayu
Department of Computer Science and Information System, Kalasin University, Thailand

ABSTRACT

This article explores the symbiotic relationship between machine learning, neural networks, and environmental science, aiming to harness the power of advanced technologies to address pressing environmental challenges. The research investigates how machine learning algorithms and neural networks can be applied to analyze complex environmental data, model intricate ecological systems, and contribute to sustainable solutions. Through an extensive literature review, a robust research methodology, and a presentation of results, this study delves into the transformative potential of integrating machine learning and neural networks in the realm of environmental science.

KEYWORDS: machine learning, neural networks, environment science

1.0 INTRODUCTION

The field of environmental science is confronted with unprecedented challenges, ranging from climate change and biodiversity loss to pollution and resource depletion. In response to these complex issues, the integration of machine learning and neural networks emerges as a revolutionary approach, offering the potential to unravel intricate environmental patterns, predict ecological outcomes, and inform sustainable decision-making. This article explores the convergence of these advanced technologies, shedding light on how machine learning and neural networks can augment our understanding of environmental dynamics, foster data-driven conservation efforts, and pave the way for a more resilient and ecologically sustainable future [1-11].

The urgency of addressing environmental challenges has never been more pressing, as our planet contends with the intricate interplay of climate change, biodiversity loss, and ecosystem degradation. In this context, the fusion of machine learning and neural networks emerges as a beacon of hope, offering unprecedented capabilities to decode the complexities of environmental science. As we stand at the crossroads of technological innovation and ecological stewardship, this article delves deeper into the transformative potential of these advanced technologies in reshaping our understanding of the environment [12-19].

Machine learning, with its ability to discern patterns from vast datasets, and neural networks, inspired by the intricate networks of the human brain, synergize to form a powerful analytical framework. This convergence holds the promise of not only predicting environmental trends with greater accuracy but also unlocking insights that were once buried within the labyrinth of complex ecological systems. The integration of machine learning and neural networks into the realm of environmental science is not merely a technological adaptation but a paradigm shift—a shift towards a future where data-driven insights inform conservation strategies, climate policies, and sustainable resource management [20-27].

The multifaceted challenges faced by environmental scientists demand innovative solutions. Traditional approaches, while valuable, often fall short in capturing the intricate nuances of environmental dynamics. Herein lies the significance of machine learning and neural networks—a marriage of computational prowess and adaptability. These technologies empower researchers to analyze large-scale environmental datasets, model intricate ecological interactions, and predict the impacts of anthropogenic activities on our planet's delicate ecosystems [28-36].

This extended introduction sets the stage for a comprehensive exploration of how the fusion of machine learning and neural networks is reshaping the landscape of environmental science. Beyond

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predictions and modeling, this convergence has the potential to revolutionize how we approach environmental conservation, offering actionable insights that can guide policymakers, conservationists, and researchers towards more informed, effective, and sustainable practices. As we navigate this dynamic intersection of technology and ecology, the subsequent sections of this article will unravel the layers of this transformative synergy, exploring the literature, delving into the research methodology, presenting results, and drawing conclusions that illuminate the path towards a harmonious coexistence between humanity and the environment [37-48].

2.0 LITERATURE REVIEW

Machine learning has increasingly found application in environmental science, transforming how researchers analyze vast and diverse datasets. From climate modeling and natural disaster prediction to biodiversity monitoring, machine learning algorithms demonstrate versatility in extracting meaningful patterns from complex environmental data. The literature highlights successful applications such as land cover classification, air quality forecasting, and water resource management, showcasing the potential for machine learning to contribute to evidence-based environmental decision-making [1-13].

Neural networks, a subset of machine learning algorithms inspired by the human brain's structure, offer unique capabilities in capturing non-linear relationships and patterns within environmental data. The literature underscores the efficacy of neural networks in modeling complex ecological systems, simulating environmental processes, and predicting the impacts of human activities on ecosystems. The adaptive nature of neural networks allows for the development of sophisticated models that evolve with new data, enhancing their accuracy in environmental predictions and assessments [14-28].

The literature review reveals a growing consensus on the synergies between machine learning, neural networks, and environmental science. The integration of these technologies holds promise for real-time environmental monitoring, early detection of ecological disturbances, and the optimization of conservation strategies. However, challenges such as data quality, interpretability of complex models, and ethical considerations in environmental decision-making pose critical questions that warrant further exploration [29-37].

The infusion of machine learning into environmental science has marked a paradigm shift, enabling researchers to extract valuable insights from the ever-expanding volume of environmental data. Machine learning algorithms, ranging from regression models to ensemble methods, have demonstrated versatility in addressing a myriad of environmental challenges. In climate science, machine learning models exhibit remarkable accuracy in predicting temperature trends, precipitation patterns, and extreme weather events. Land cover classification, a critical task for biodiversity assessments, benefits from the discriminative power of machine learning, allowing for precise identification of ecosystems and habitat changes. The literature highlights successful applications in air and water quality monitoring, where machine learning models enhance our ability to detect pollution sources, predict pollutant concentrations, and guide regulatory interventions [38-46].

Neural networks, inspired by the architecture of the human brain, bring a unique set of capabilities to environmental modeling. These deep learning structures excel in capturing non-linear relationships, making them well-suited for tasks that involve intricate ecological interactions. In the realm of biodiversity conservation, neural networks demonstrate proficiency in species identification through image recognition, aiding in monitoring and protecting endangered flora and fauna. Ecological modeling benefits from the adaptive nature of neural networks, as they can dynamically adjust to new data inputs, improving the accuracy of predictions related to ecosystem dynamics, species distribution, and the impact of human activities on biodiversity [47-59].

The literature reveals a growing recognition of the synergies between machine learning and neural networks in advancing environmental science. The combination of machine learning's data-driven analytical capabilities with the adaptability and non-linear modeling prowess of neural networks creates a formidable toolkit for unraveling complex environmental patterns. Successful applications include the prediction of deforestation, modeling the impacts of climate change on species migration, and optimizing land-use planning for sustainable resource management. However, challenges persist. The interpretability of complex neural network models remains a concern, especially in domains where

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explainability is crucial for decision-making. The need for large, labeled datasets for effective model training poses a challenge, particularly in fields with limited historical environmental data [1-17].

As machine learning and neural networks become integral to environmental decision-making, the literature emphasizes the importance of ethical considerations. Ensuring transparency in the decision-making processes of these models is crucial, especially when their outcomes influence conservation policies and resource management. Addressing biases in training data and mitigating potential unintended consequences of automated decision-making are pivotal ethical considerations that warrant ongoing attention as these technologies advance [18-25].

In summary, the extended literature review underscores the diverse applications and transformative potential of machine learning and neural networks in environmental science. From predicting environmental trends to modeling complex ecological systems, the synergy between these technologies provides a holistic approach to addressing pressing environmental challenges. As the subsequent sections delve into the research methodology and results, the literature review sets the stage for understanding how these technologies are practically applied, refined, and contribute to the evolution of environmental science in the pursuit of a sustainable and resilient future [26-35].

Machine learning applications in environmental science continue to expand, showcasing its adaptability across diverse domains. In atmospheric science, machine learning models contribute to weather forecasting precision, aiding in predicting storms, droughts, and other extreme weather events. The integration of satellite data and machine learning algorithms enables the accurate monitoring of deforestation, land-use changes, and urbanization. Moreover, machine learning facilitates the analysis of large-scale climate datasets, offering insights into climate change patterns, identifying key drivers, and supporting mitigation strategies. In water resource management, machine learning proves invaluable for predicting water quality, optimizing reservoir operations, and managing water distribution networks [36-44].

Neural networks, with their ability to capture intricate patterns and relationships, find extensive applications in environmental modeling. In ecosystem modeling, neural networks provide a dynamic framework for simulating complex interactions between species, habitats, and environmental variables. The literature showcases neural networks' success in predicting the spread of invasive species, enabling proactive conservation measures. Additionally, neural networks play a pivotal role in ecological niche modeling, helping researchers understand species distribution patterns and assess the potential impact of climate change on biodiversity. Their adaptive nature allows for continuous learning and refinement, making them well-suited for scenarios where environmental conditions evolve over time [45-49].

The synergy between machine learning and neural networks amplifies their impact on environmental science. Collaborative applications include the integration of machine learning algorithms to enhance neural network performance and vice versa. This combined approach strengthens the accuracy of predictions, particularly in tasks such as ecosystem service valuation, where intricate relationships between ecosystems and human well-being are modeled. Challenges persist, such as the interpretability of complex neural network architectures, posing hurdles for effective communication of model outcomes to policymakers and stakeholders. Balancing the trade-off between model complexity and interpretability remains an area of ongoing research [1-17].

Ethical considerations surrounding the use of machine learning and neural networks in environmental science merit attention. Transparency in model development, validation, and decision-making processes is crucial for building trust among stakeholders. The potential biases embedded in training data demand careful consideration to ensure fair and unbiased outcomes, particularly in applications influencing environmental policies. As these technologies become integral to decision support systems, ethical frameworks need to evolve, emphasizing accountability, fairness, and inclusivity in environmental decision-making [18-29].

The literature increasingly highlights the role of machine learning and neural networks in harnessing data from citizen science initiatives. Crowdsourced environmental observations, coupled with machine

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learning algorithms, empower communities to actively contribute to environmental monitoring. Applications include the identification of wildlife species, tracking migratory patterns, and monitoring changes in local ecosystems. This participatory approach not only enriches environmental datasets but also fosters a sense of community engagement and environmental stewardship [30-46].

In summary, the extended literature review emphasizes the expanding role of machine learning and neural networks in diverse facets of environmental science. From advancing predictive capabilities to addressing ethical considerations and embracing citizen science, the synthesis of these technologies is reshaping how we perceive, model, and respond to environmental challenges. As the subsequent sections delve into the research methodology and results, the literature review forms a robust foundation, illuminating the trajectory of advancements in the integration of machine learning and neural networks within the realm of environmental science [47-59].

3.0 RESEARCH METHODOLOGY

To comprehensively investigate the integration of machine learning and neural networks in environmental science, a systematic research methodology was employed. Datasets encompassing climate records, satellite imagery, biodiversity data, and environmental monitoring information were collected. Machine learning models, including decision trees, support vector machines, and neural networks, were trained and validated to perform tasks such as species identification, climate trend analysis, and pollution prediction. The methodology also involved the development of neural network architectures tailored to environmental modeling, emphasizing the adaptability and predictive power of these advanced algorithms.

The research methodology adopted for this study aimed to harness the full potential of machine learning and neural networks in addressing complex environmental challenges. Comprehensive datasets encompassing diverse environmental variables, including climate records, satellite imagery, biodiversity indices, and pollution metrics, were systematically collected. The preprocessing phase involved rigorous data cleaning, normalization, and feature engineering to ensure the quality and relevance of input data for subsequent modeling.

Machine learning models, ranging from traditional regression algorithms to more sophisticated ensemble methods, were employed for tasks such as climate trend analysis, air and water quality predictions, and land cover classification. The iterative model training process involved fine-tuning hyperparameters and validating against ground truth data to enhance accuracy. The neural network architecture, inspired by the intricate structures of ecosystems, was tailored to capture non-linear relationships within ecological systems. The adaptive learning capabilities of neural networks were exploited to model temporal dynamics and complex interactions, ensuring the models' ability to adapt to changing environmental conditions.

Furthermore, the research methodology embraced a participatory element by integrating citizen science data into the analysis. Crowdsourced environmental observations were used to supplement existing datasets, fostering a collaborative approach to environmental monitoring. This inclusion aimed to enhance the richness of the dataset, capture local nuances, and empower communities to actively contribute to the research agenda.

Ethical considerations played a pivotal role throughout the research process. Transparent communication of model outcomes, addressing potential biases, and ensuring data privacy were prioritized. Additionally, interpretability features were incorporated into the machine learning and neural network models to provide insights into the decision-making processes, fostering trust among stakeholders.

This extended research methodology aimed not only to advance the predictive capabilities of machine learning and neural networks but also to promote a holistic and inclusive approach to environmental research. As we move into the presentation of results, this methodology forms the bedrock for understanding the transformative impact of these technologies on our understanding of environmental dynamics.

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4.0 RESULT

The results of the research showcase the transformative impact of integrating machine learning and neural networks in environmental science. Machine learning models demonstrated remarkable accuracy in predicting climate trends, identifying biodiversity hotspots, and forecasting environmental changes. Neural networks, with their ability to capture complex patterns, excelled in modeling the interactions between environmental variables and predicting the impacts of human activities on ecosystems. The synergistic application of these technologies revealed a more holistic understanding of environmental dynamics, providing valuable insights for sustainable resource management and conservation efforts.

The results of our comprehensive study demonstrate the transformative impact of machine learning and neural networks in elucidating intricate environmental dynamics. Machine learning models exhibited exceptional accuracy in predicting climate trends, enabling precise forecasting of extreme weather events and contributing to climate change mitigation strategies. Neural networks, with their adaptive capabilities, excelled in capturing non-linear relationships within ecological systems. Ecosystem modeling benefited from the neural network architecture, revealing nuanced interactions between species, habitats, and environmental variables. The integration of citizen science data enriched our understanding of local ecosystems, providing valuable insights into wildlife tracking and community-led environmental monitoring.

In air and water quality predictions, machine learning models showcased their effectiveness in identifying pollution sources and forecasting pollutant concentrations. The dynamic adaptability of neural networks allowed for the real-time modeling of changing environmental conditions, offering a valuable tool for proactive pollution management. Land cover classification, a critical task for biodiversity monitoring, saw significant improvements in accuracy, enabling more precise identification of habitat changes and supporting conservation efforts.

The participatory inclusion of citizen science data not only enhanced the spatial and temporal granularity of our analyses but also fostered community engagement in environmental monitoring. The collaborative synergy between machine learning, neural networks, and citizen science highlighted the potential for a decentralized, community-driven approach to environmental research.

5.0 CONCLUSION

In conclusion, the integration of machine learning and neural networks in environmental science represents a paradigm shift in our approach to addressing environmental challenges. The results of this study affirm the transformative potential of these technologies, offering practical insights into their application across diverse environmental scenarios. As we navigate the complexities of environmental conservation, the synergy between machine learning and neural networks emerges as a powerful tool for data-driven decision-making, ecological modeling, and sustainable environmental management. Continued exploration and refinement of these technologies are essential for realizing the full potential of an integrated, intelligent approach to environmental science, fostering a harmonious coexistence between human activities and the delicate balance of our planet's ecosystems.

In conclusion, our research underscores the pivotal role of machine learning and neural networks in advancing environmental science towards a more sustainable and resilient future. The extended results showcase the transformative capabilities of these technologies in climate prediction, ecological modeling, pollution management, and biodiversity monitoring. The participatory integration of citizen science not only enhances the richness of our datasets but also empowers communities to actively contribute to environmental conservation.

As we stand at the nexus of technological innovation and environmental stewardship, the potential for machine learning and neural networks to inform evidence-based decision-making is undeniable. However, ethical considerations, transparency, and ongoing efforts to address challenges such as model interpretability remain paramount. This research not only contributes to the evolving landscape of environmental science but also emphasizes the need for a holistic and inclusive approach, where advanced technologies, community participation, and ethical considerations converge to create a more sustainable and harmonious relationship between humanity and the environment. The journey towards

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a resilient and ecologically balanced future continues, with machine learning and neural networks serving as valuable allies in our pursuit of environmental understanding and conservation.

REFERENCES

[1] Han, Barbara A., et al. "A synergistic future for AI and ecology." Proceedings of the National Academy of Sciences 120.38 (2023): e2220283120.

[2] Lei, Qi, et al. "Emerging Directions for Carbon Capture Technologies: A Synergy of High-Throughput Theoretical Calculations and Machine Learning." Environmental Science & Technology 57.45 (2023): 17189-17200.

[3] Holzinger, Andreas, et al. "Digital transformation for sustainable development goals (sdgs)-a security, safety and privacy perspective on ai." International cross-domain conference for machine learning and knowledge extraction. Cham: Springer International Publishing, 2021.

[4] Seidi, Navid, Ardhendu Tripathy, and Sajal K. Das. "Using Geographic Location-based Public Health Features in Survival Analysis." *arXiv preprint arXiv:2304.07679* (2023).

[5] Husain, Ghulam. "Harnessing Big Data Analytics for Enhanced Machine Learning Algorithms." Journal Environmental Sciences And Technology 2.2 (2023): 21-35.

[6] Samadani, Alireza, and Saleh Akbarzadeh. "Experimental and numerical prediction of wear coefficient in non-conformal lubricated rectangular contact using continuum damage mechanics." *Surface Topography: Metrology and Properties* 8.2 (2020): 025012.

[7] Frontistis, Zacharias, et al. "Photocatalytic (UV-A/TiO2) degradation of 17α-ethynylestradiol in environmental matrices: Experimental studies and artificial neural network modeling." Journal of Photochemistry and Photobiology A: Chemistry 240 (2012): 33-41.

[8] Seidi, Navid, Farshad Eshghi, and Manoochehr Kelarestaghi. "PV 2 MS: Patient Virtual Visitation Management System in the Context of a Smart City." *IEEE EUROCON 2019-18th International Conference on Smart Technologies*. IEEE, 2019.

[9] Suryadevara, Chaitanya Krishna. "Transforming Business Operations: Harnessing Artificial Intelligence and Machine Learning in the Enterprise." International Journal of Creative Research Thoughts (IJCRT), ISSN: 2320-2882.

[10] Rayhan, Abu, and Shahana Rayhan. "Quantum Computing and AI: A Quantum Leap in Intelligence." (2023).

[11] Bibri, Simon Elias, et al. "Smarter eco-cities and their leading-edge artificial intelligence of things solutions for environmental sustainability: A comprehensive systematic review." Environmental Science and Ecotechnology 19 (2024): 100330.

[12] Memari, Majid. "Advances in Computer Vision and Image Processing for Pattern Recognition: A Comprehensive Review." *International Journal of Engineering and Applied Sciences* 11.05 (2023): 2896-2901.

[13] Ma, Zhengjing, and Gang Mei. "Deep learning for geological hazards analysis: Data, models, applications, and opportunities." Earth-Science Reviews 223 (2021): 103858.

[14] Rahimpour, Mohsen, Alireza Samadani, and Saleh Akbarzadeh. "Application of Load-Sharing Concept to Mechanical Seals." *Lubricants* 11.6 (2023): 266.

[15] Vasileiou, Marios, et al. "Transforming weed management in sustainable agriculture with artificial intelligence: a systematic literature review towards weed identification and deep learning." Crop Protection (2023): 106522.

[16] Smetana, Sergiy, Christian Seebold, and Volker Heinz. "Neural network, blockchain, and modular complex system: The evolution of cyber-physical systems for material flow analysis and life cycle assessment." Resour Conserv Recycl 133 (2018): 229-230.

[17] Vafaie, Sepideh, and Eysa Salajegheh. "A Comparative Study of Shearlet, Wavelet, Laplacian Pyramid, Curvelet, and Contourlet Transform to Defect Detection." *Journal of Soft Computing in Civil Engineering* 7.2 (2023): 1-42.

[18] Camps-Valls, Gustau, et al., eds. Deep learning for the Earth Sciences: A comprehensive approach to remote sensing, climate science and geosciences. John Wiley & Sons, 2021.

[19] Bianco, Michael J., et al. "Machine learning in acoustics: Theory and applications." The Journal of the Acoustical Society of America 146.5 (2019): 3590-3628.

[20] Tavassolizadeh, Hossein, et al. "Evaluation of Greater Palatine Canal and Foramen Anatomical Variation on Cone-beam CT Radiography." *Journal of" Regeneration, Reconstruction & Restoration"(Triple R)* 4.4 (2019): 151-155.

[21] Hwang, Hyun Seok, Aida Rahimi Kahmini, Julia Prascak, Alexis Cejas-Carbonell, Isela C. Valera, Samantha Champion, Mikayla Corrigan, Florence Mumbi, and Michelle S. Parvatiyar. "Sarcospan Deficiency Increases Oxidative Stress and Arrhythmias in Hearts after Acute Ischemia-Reperfusion Injury." *International Journal of Molecular Sciences* 24, no. 14 (2023): 11868.

[22] Schütt, Kristof T., et al. "Unifying machine learning and quantum chemistry with a deep neural network for molecular wavefunctions." Nature communications 10.1 (2019): 5024.

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[23] Esmaeilian, Amirmohamad, et al. "The Examination of Root Morphology of the Maxillary First and Second Molars Using Cone Beam Computed Tomography." *JOURNAL OF ISFAHAN DENTAL SCHOOL,[online]* 17.3 (2021): 329-336.
[24] Narine, Lana L., Sorin C. Popescu, and Lonesome Malambo. "Synergy of ICESat-2 and Landsat for mapping forest aboveground biomass with deep learning." Remote Sensing 11.12 (2019): 1503.
[25] Homaeinezhad, Mahdi, Omid Beik, and Awais Karni. "Multiphase Multilevel NPC Converter for MVDC Electric Ship Applications." *2023 IEEE Electric Ship Technologies Symposium (ESTS)*. IEEE, 2023.
[26] Mendhurwar, Subodh, and Rajhans Mishra. "Integration of social and IoT technologies: architectural framework for digital transformation and cyber security challenges." Enterprise Information Systems 15.4 (2021): 565-584.
[27] Ma, Shijun, et al. "Estimating physical composition of municipal solid waste in China by applying artificial neural network method." Environmental science & technology 54.15 (2020): 9609-9617.
[28] Heydari, Melika, Ashkan Heydari, and Mahyar Amini. "Energy Management and Energy Consumption: A Comprehensive Study." *World Information Technology and Engineering Journal* 10.04 (2023): 22-28.
[29] Heydari, Melika, Ashkan Heydari, and Mahyar Amini. "Energy Consumption, Solar Power Generation, and Energy Management: A Comprehensive Review." *World Engineering and Applied Sciences Journal* 11.02 (2023): 196-202.
[30] Heydari, Melika, Ashkan Heydari, and Mahyar Amini. "Energy Consumption, Energy Management, and Renewable Energy Sources: An Integrated Approach." *International Journal of Engineering and Applied Sciences* 9.07 (2023): 167-173.
[31] Heydari, Melika, Ashkan Heydari, and Mahyar Amini. "Solar Power Generation and Sustainable Energy: A Review." *International Journal of Technology and Scientific Research* 12.03 (2023): 342-349.
[32] Sharifani, Koosha and Mahyar Amini. "Machine Learning and Deep Learning: A Review of Methods and Applications." World Information Technology and Engineering Journal 10.07 (2023): 3897-3904.
[33] Amini, Mahyar and Ali Rahmani. "How Strategic Agility Affects the Competitive Capabilities of Private Banks." *International Journal of Basic and Applied Sciences* 10.01 (2023): 8397-8406.
[34] Amini, Mahyar and Ali Rahmani. "Achieving Financial Success by Pursuing Environmental and Social Goals: A Comprehensive Literature Review and Research Agenda for Sustainable Investment." *World Information Technology and Engineering Journal* 10.04 (2023): 1286-1293.
[35] Amini, Mahyar, and Zavareh Bozorgasl. "A Game Theory Method to Cyber-Threat Information Sharing in Cloud Computing Technology ." *International Journal of Computer Science and Engineering Research* 11.4 (2023): 549-560.
[36] Nazari Enjedani, Somayeh, and Mahyar Amini. "The role of traffic impact effect on transportation planning and sustainable traffic management in metropolitan regions." *International Journal of Smart City Planning Research* 12, no. 2023 (2023): 688-700.
[37] Jahanbakhsh Javid, Negar, and Mahyar Amini. "Evaluating the effect of supply chain management practice on implementation of halal agroindustry and competitive advantage for small and medium enterprises ." International Journal of Computer Science and Information Technology 15.6 (2023): 8997-9008
[38] Amini, Mahyar, and Negar Jahanbakhsh Javid. "A Multi-Perspective Framework Established on Diffusion of Innovation (DOI) Theory and Technology, Organization and Environment (TOE) Framework Toward Supply Chain Management System Based on Cloud Computing Technology for Small and Medium Enterprises ." International Journal of Information Technology and Innovation Adoption 11.8 (2023): 1217-1234
[39] Amini, Mahyar and Ali Rahmani. "Agricultural databases evaluation with machine learning procedure." Australian Journal of Engineering and Applied Science 8.6 (2023): 39-50
[40] Amini, Mahyar, and Ali Rahmani. "Machine learning process evaluating damage classification of composites." International Journal of Science and Advanced Technology 9.12 (2023): 240-250
[41] Amini, Mahyar, Koosha Sharifani, and Ali Rahmani. "Machine Learning Model Towards Evaluating Data gathering methods in Manufacturing and Mechanical Engineering." International Journal of Applied Science and Engineering Research 15.4 (2023): 349-362.
[42] Sharifani, Koosha and Amini, Mahyar and Akbari, Yaser and Aghajanzadeh Godarzi, Javad. "Operating Machine Learning across Natural Language Processing Techniques for Improvement of Fabricated News Model." International Journal of Science and Information System Research 12.9 (2022): 20-44.
[43] Amini, Mahyar, et al. "MAHAMGOSTAR.COM AS A CASE STUDY FOR ADOPTION OF LARAVEL FRAMEWORK AS THE BEST PROGRAMMING TOOLS FOR PHP BASED WEB DEVELOPMENT FOR SMALL AND MEDIUM ENTERPRISES." Journal of Innovation & Knowledge, ISSN (2021): 100-110.
[44] Amini, Mahyar, and Aryati Bakri. "Cloud computing adoption by SMEs in the Malaysia: A multi-perspective framework based on DOI theory and TOE framework." Journal of Information Technology & Information Systems Research (JITISR) 9.2 (2015): 121-135.
[45] Amini, Mahyar, and Nazli Sadat Safavi. "A Dynamic SLA Aware Heuristic Solution For IaaS Cloud Placement Problem Without Migration." International Journal of Computer Science and Information Technologies 6.11 (2014): 25-30.
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[46] Amini, Mahyar. "The factors that influence on adoption of cloud computing for small and medium enterprises." (2014).
[47] Amini, Mahyar, et al. "Development of an instrument for assessing the impact of environmental context on adoption of cloud computing for small and medium enterprises." Australian Journal of Basic and Applied Sciences (AJBAS) 8.10 (2014): 129-135.
[48] Amini, Mahyar, et al. "The role of top manager behaviours on adoption of cloud computing for small and medium enterprises." Australian Journal of Basic and Applied Sciences (AJBAS) 8.1 (2014): 490-498.
[49] Amini, Mahyar, and Nazli Sadat Safavi. "A Dynamic SLA Aware Solution For IaaS Cloud Placement Problem Using Simulated Annealing." International Journal of Computer Science and Information Technologies 6.11 (2014): 52-57.
[50] Sadat Safavi, Nazli, Nor Hidayati Zakaria, and Mahyar Amini. "The risk analysis of system selection and business process re-engineering towards the success of enterprise resource planning project for small and medium enterprise." World Applied Sciences Journal (WASJ) 31.9 (2014): 1669-1676.
[51] Sadat Safavi, Nazli, Mahyar Amini, and Seyyed AmirAli Javadinia. "The determinant of adoption of enterprise resource planning for small and medium enterprises in Iran." International Journal of Advanced Research in IT and Engineering (IJARIE) 3.1 (2014): 1-8.
[52] Sadat Safavi, Nazli, et al. "An effective model for evaluating organizational risk and cost in ERP implementation by SME." IOSR Journal of Business and Management (IOSR-JBM) 10.6 (2013): 70-75.
[53] Safavi, Nazli Sadat, et al. "An effective model for evaluating organizational risk and cost in ERP implementation by SME." IOSR Journal of Business and Management (IOSR-JBM) 10.6 (2013): 61-66.
[54] Amini, Mahyar, and Nazli Sadat Safavi. "Critical success factors for ERP implementation." International Journal of Information Technology & Information Systems 5.15 (2013): 1-23.
[55] Amini, Mahyar, et al. "Agricultural development in IRAN base on cloud computing theory." International Journal of Engineering Research & Technology (IJERT) 2.6 (2013): 796-801.
[56] Amini, Mahyar, et al. "Types of cloud computing (public and private) that transform the organization more effectively." International Journal of Engineering Research & Technology (IJERT) 2.5 (2013): 1263-1269.
[57] Amini, Mahyar, and Nazli Sadat Safavi. "Cloud Computing Transform the Way of IT Delivers Services to the Organizations." International Journal of Innovation & Management Science Research 1.61 (2013): 1-5.
[58] Abdollahzadegan, A., Che Hussin, A. R., Moshfegh Gohary, M., & Amini, M. (2013). The organizational critical success factors for adopting cloud computing in SMEs. Journal of Information Systems Research and Innovation (JISRI), 4(1), 67-74.
[59] Khoshraftar, Alireza, et al. "Improving The CRM System In Healthcare Organization." International Journal of Computer Engineering & Sciences (IJCES) 1.2 (2011): 28-35.

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