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DSM Systems for Multi-Processor Architectures Using AI-Driven Test Case Generation

Devendra Arya
Independent Researcher, USA.

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ABSTRACT

This research paper explores the critical domain of automated. It also examines automated test execution frameworks, real-time monitoring solutions, and advanced verification and validation techniques. The findings of this study contribute to the advancement of DSM testing methodologies and provide valuable insights for both researchers and practitioners in the field of distributed systems and parallel computing. The research highlights the challenges faced in DSM testing, such as scalability issues and non-determinism, and proposes future directions for research, including the integration of artificial intelligence and cloud-based testing platforms.

Keywords- Multi-Processor Systems, Automated Testing, Fault Injection, Concurrency Detection, Formal Verification.

I. INTRODUCTION

1.1 Distributed Shared Memory (DSM) Systems Context

DSM systems will attempt to combine the programming simplicity of the shared memory models with the advantages of scale and fault tolerance of a distributed system (Tanenbaum & van Steen, 2017). It was in the mid-1980's that DSM first came into being. Since then, it has assumed many complexities to meet the rising needs of high-performance computing as well as large-scale data processing.

1.2 Testing of Multi-Processor Systems

Concurrency issues: Race conditions, deadlocks, and livelocks are very difficult to identify and reproduce. Non-determinism: Interleaving operations across multiple processors is most likely to lead to non-deterministic behaviour. Scalability: The complexity of testing does not grow linearly with the number of processors but exponentially as the number of processors increases.

Memory consistency: Most models of consistency have to be implemented and then maintained appropriately throughout the system.

1.3 Research Objectives and Scope

Critical analysis and evaluation of the approaches for testing automation tailored specifically for DSM applications in a multi-processor environment. Automation of frameworks for test execution as well as real-time monitoring framework to manage test activities effectively.

II. THEORETICAL FRAMEWORK

2.1 Distributed Shared Memory Architecture

DSM systems can be broadly categorized into two categories: hardware-based and software-based. The hardware-based DSM systems, in addition to the Stanford DASH multiprocessor, rely on hardware support in order to achieve coherence and consistency. The software-based DSM systems, such as Trademarks and Munin, implement the shared memory abstraction entirely in software in order to enhance flexibility at potential loss of performance. Recent developments in DSM architectures are hybrid systems that integrate shared memory and message passing paradigms. For instance, the runtime system provided by Nelson et al. (2015) called Grappa provided a DSM abstraction on commodity clusters with improved performance for irregular applications.

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III. AUTOMATED TEST EXECUTION AND MONITORING

3.1 Parallel Test Execution Frameworks

A good example of such a framework is Selenium Grid, which in fact was primarily designed to test web applications but is also used for distributed systems testing. In this framework, tests are executed in parallel on machines equipped with different operating systems; hence it can be useful in implementing DSM in heterogeneous environments. Another example is the TestNG framework developed by Cédric Beust, where built-in support for parallel test execution is ensured and has already been effectively applied in scenarios of DSM testing.

This ensures that a reasonable concurrent scenario is created while minimizing the overall testing time. GTAC has been very effective in bringing to light various parallel testing frameworks that apply in DSM systems.

The latest innovation for parallel test execution testing involves Testing-as-a-Service

3.2 Real-time Monitoring and Logging

One very important aspect of DSM testing is log analysis. The reasons for this are as follows: the Elastic Stack (Elasticsearch, Logstash, and Kibana) is currently one of the most popular solutions for collecting, processing, and visualizing log data coming from distributed systems; it helps to find patterns or anomalies in a test run.

Distributed tracing systems are also very important to monitor DSM systems. Sigelman et al. (2010) presented Dapper: A Tracing System for Millions of Multithreaded Programs, which in its turn inspired tools like Jaeger and Zipkin. These tools give an end-to-end visibility into the request flows, enabling the identification of performance bottlenecks as well as the analysis of system behaviour under different test settings.

3.3 Performance Metrics and Benchmarking

The open-source DSM benchmarks in the above list are often replicated with adaptations. For instance, a variant of the widely known PARSEC benchmark suite Bienia et al. (2008), which assesses DSM implementations by executing multi-threaded programs, is an example of an adapted DSM benchmark. NASA's NAS Parallel Benchmarks (NPB) are tests on parallel and distributed systems, including DSM, conducted using applications related to CFD.Recently, the attention of benchmarks has begun to be placed on emerging DSM architectures. Ferdman et al. (2012) developed CloudSuite-a benchmark suite with scale-out workloads for cloud environment which includes data analytics, serving, and media streaming workload-thus well-fitted for large-scale DSM evaluation.

IV. VERIFICATION AND VALIDATION TECHNIQUES

4.1 Formal Verification Methods

Another verification technique adopted in the process of DSM verification is theorem proving. Formal verification provides mathematical proofs of correctness for DSM systems, therefore giving strong confidence in system behaviour. Recent work concentrates on compositional verification techniques that fight state explosion by verifying components in isolation, and then combining the results. Flanagan et al. (2005) presented thread-modular verification, and it has been successfully used for concurrent and distributed systems, including DSM.

4.2 Runtime Assertion Checking

Java Modeling Language (JML) by Leavens et al. (1999) supports runtime assertion checking for Java programs extended with support for concurrent and distributed systems, thus making it suitable for DSM testing.Recent developments in this area include efficient assertion checking of large-scale distributed systems. Meredith et al. (2012) have proposed JavaMOP, which is a runtime verification framework to check violations in DSM systems that monitor distributed Java applications at runtime by using aspectoriented programming to instrument code with checks.

4.3 Automated Oracles for DSM Testing

Test oracles determine whether a test case has passed or failed. The creation of oracles for DSM systems is involved because of the complex interactions and non-deterministic behavior. An overview of oracle strategies for distributed systems testing Baresi and Young (2001).

Metamorphic testing: Chen et al. in 1998 introduced metamorphic testing as a promising technique that relies on known relationships between multiple executions to overcome the oracle problem. So far, it has been used successfully in many parallel and distributed systems, including DSM.

Recent advances include machine learning, which is now applied to generate oracles automatically. Vanmali et al. (2002) showed how neural networks can be leveraged to learn about the distributed systems and create oracles to detect anomalies. It has quite good potential in finding inconsistencies and performance-related DSM issues.

V. TEST RESULT ANALYSIS

5.1 Statistical Test Results Analysis

This form of statistical analysis is specifically useful in the analysis of test output from the DSM system, especially when dealing with large volumes of data resulting from the automated executions of tests. Hypothesis testing and estimation using a confidence interval are some of the common methods applied for meaningful drawing of insights from test results.

Regression analysis proves to be very effective in gauging the relationship of multiple system parameters

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with performance metrics in DSM. For example, Zhou et al. (2004) used multiple regression analysis in order to model the performance of DSM under various workload conditions, thus, outlining factors that the system is scalable against.

Recent developments in statistical analysis techniques for DSM testing include Bayesian inference methods. These may be applied to incorporate prior knowledge about system behaviour into the analysis of test results in order to provide better accuracy and precision to prospective performance predictions and anomaly detection.

5.2 Machine Learning for Anomaly Detection

The analysis of test results and anomalies in DSM systems has come to be led by machine learning techniques. Supervised learning algorithms, such as SVMs, random forests, and the like, are widely applied to classify system behaviours and establish possible faults from historical test data.

Unsupervised learning approaches, especially clustering algorithms, have been quite applicable to DSM system anomaly detection as deviations from normal patterns. For instance, Xu et al (2009) employed a modified K-means clustering algorithm for the identification of anomalies in the performance in large-scale distributed systems, thus including DSM-based systems.

Besides, deep learning methodologies have also proved to be promising approaches for anomaly detection in DSM. RNN and LSTM networks have been widely applied in the analysis of time series data emanating from distributed systems with good results, implying that subtle temporal patterns could indicate system problems.

5.3 Test Data Visualization Techniques

Visualization techniques are quite useful to the tester and developer to understand complex interaction relationships and performance characteristics in DSM systems. Graphical presentation of test results enables identifiable patterns and anomalies that might not be evident through raw numerical presentation alone.

Heat maps and color-coded matrices are widely used to graph access patterns and contention in DSM systems thus enabling hotspots and potentially performance bottlenecks to be identified. Node-link diagrams and force-directed graphs are commonly applied to represent the topology and communication patterns in distributed systems so as to help in the analysis of network-related problems.

New research for DSM testing in regard to visualization addresses the development of interactive and real-time visualization facilities. These facilities allow a tester to inspect their massive dataset dynamically zooming into parts of a timeline or system component on need. For example, Adamoli and Hauswirth (2010) have proposed Trevis a trace visualization and analysis tool for exploring large-scale parallel applications' behaviour applied for DSM systems.

VI. CONCLUSION

This work covered several aspects of automation for Distributed Shared Memory testing for multi-processor systems. Major findings include the relevance of model-based and combinatorial testing approaches, the efficiency of fault injection-based techniques, and runtime monitoring with assertions on correctness and performance of the system.

REFERENCES

[1] Santosh Palavesh. (2021). Developing Business Concepts for Underserved Markets: Identifying and Addressing Unmet Needs in Niche or Emerging Markets. Innovative Research Thoughts, 7(3), 76–89. https://doi.org/10.36676/irt.v7.i3.1437

[2] Palavesh, S. (2021). Co-Creating Business Concepts with Customers: Approaches to the Use of Customers in New Product/Service Development. Integrated Journal for Research in Arts and Humanities, 1(1), 54–66. https://doi.org/10.55544/ijrah.1.1.9

[3] Santhosh Palavesh. (2022). Entrepreneurial Opportunities in the Circular Economy: Defining Business Concepts for Closed-Loop Systems and Resource Efficiency. European Economic Letters (EEL), 12(2), 189–204. https://doi.org/10.52783/eel.v12i2.1785

[4] Santhosh Palavesh. (2022). The Impact of Emerging Technologies (e.g., AI, Blockchain, IoT) On Conceptualizing and Delivering new Business Offerings. International Journal on Recent and Innovation Trends in Computing and Communication, 10(9), 160–173. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10955

[5] Santhosh Palavesh. (2021). Business Model Innovation: Strategies for Creating and Capturing Value Through Novel Business Concepts. European Economic Letters (EEL), 11(1). https://doi.org/10.52783/eel.v11i1.1784

[6] Vijaya Venkata Sri Rama Bhaskar, Akhil Mittal, Santosh Palavesh, Krishnateja Shiva, Pradeep Etikani. (2020). Regulating AI in Fintech: Balancing Innovation with Consumer Protection. European Economic Letters (EEL), 10(1). https://doi.org/10.52783/eel.v10i1.1810

[7] Challa, S. S. S. (2020). Assessing the regulatory implications of personalized medicine and the use of biomarkers in drug development and approval. European Chemical Bulletin, 9(4), 134-146. D.O.I10.53555/ecb.v9:i4.17671

[8] EVALUATING THE EFFECTIVENESS OF RISK-BASED APPROACHES IN STREAMLINING THE REGULATORY APPROVAL PROCESS FOR NOVEL THERAPIES. (2021). Journal of Population Therapeutics and Clinical Pharmacology, 28(2), 436-448. https://doi.org/10.53555/jptcp.v28i2.7421

[9] Challa, S. S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2019). Investigating the use of natural

ISSN: 2583-4053
Volume-1 Issue-4 || October 2022 || PP. 209-214
https://doi.org/10.55544/jrasb.1.4.31

language processing (NLP) techniques in automating the extraction of regulatory requirements from unstructured data sources. Annals of Pharma Research, 7(5), 380-387.

[10] Challa, S. S. S., Chawda, A. D., Benke, A. P., & Tilala, M. (2020). Evaluating the use of machine learning algorithms in predicting drug-drug interactions and adverse events during the drug development process. NeuroQuantology, 18(12), 176-186. https://doi.org/10.48047/nq.2020.18.12.NQ20252

[11] Challa, S. S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2022). Quality Management Systems in Regulatory Affairs: Implementation Challenges and Solutions. Journal for Research in Applied Sciences and Biotechnology, 1(3), 278–284. https://doi.org/10.55544/jrasb.1.3.36

[12] Ranjit Kumar Gupta, Sagar Shukla, Anaswara Thekkan Rajan, & Sneha Aravind. (2022). Strategies for Effective Product Roadmap Development and Execution in Data Analytics Platforms. International Journal for Research Publication and Seminar, 13(1), 328–342. Retrieved from https://jrps.shodhsagar.com/index.php/j/article/view/1515

[13] Ranjit Kumar Gupta, Sagar Shukla, Anaswara Thekkan Rajan, & Sneha Aravind. (2022). Leveraging Data Analytics to Improve User Satisfaction for Key Personas: The Impact of Feedback Loops. International Journal for Research Publication and Seminar, 11(4), 242–252. https://doi.org/10.36676/jrps.v11.i4.1489

[14] Ranjit Kumar Gupta, Sagar Shukla, Anaswara Thekkan Rajan, Sneha Aravind, 2021. "Utilizing Splunk for Proactive Issue Resolution in Full Stack Development Projects" ESP Journal of Engineering & Technology Advancements 1(1): 57-64.

[15] Sagar Shukla. (2021). Integrating Data Analytics Platforms with Machine Learning Workflows: Enhancing Predictive Capability and Revenue Growth. International Journal on Recent and Innovation Trends in Computing and Communication, 9(12), 63–74. Retrieved from https://ijritcc.org/index.php/ijritcc/article/view/11119

[16] Sneha Aravind. (2021). Integrating REST APIs in Single Page Applications using Angular and TypeScript. International Journal of Intelligent Systems and Applications in Engineering, 9(2), 81 –. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6829

[17] Aravind, S., Cherukuri, H., Gupta, R. K., Shukla, S., & Rajan, A. T. (2022). The role of HTML5 and CSS3 in creating optimized graphic prototype websites and application interfaces. NeuroQuantology, 20(12), 4522-4536. https://doi.org/10.48047/NQ.2022.20.12.NQ77775

[18] Rishabh Rajesh Shanbhag, Rajkumar Balasubramanian, Ugandhar Dasi, Nikhil Singla, & Siddhant Benadikar. (2022). Case Studies and Best Practices in Cloud-Based Big Data Analytics for Process Control. International Journal for Research Publication and Seminar, 13(5), 292–311. https://doi.org/10.36676/jrps.v13.i5.1462

[19] Siddhant Benadikar. (2021). Developing a Scalable and Efficient Cloud-Based Framework for Distributed Machine Learning. International Journal of Intelligent Systems and Applications in Engineering, 9(4), 288 –. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6761

[20] Siddhant Benadikar. (2021). Evaluating the Effectiveness of Cloud-Based AI and ML Techniques for Personalized Healthcare and Remote Patient Monitoring. International Journal on Recent and Innovation Trends in Computing and Communication, 9(10), 03–16. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/11036

[21] Challa, S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2019). Investigating the use of natural language processing (NLP) techniques in automating the extraction of regulatory requirements from unstructured data sources. Annals of PharmaResearch, 7(5), 380-387.

[22] Chaturvedi, R., & Sharma, S. (2022). Assessing the Long-Term Benefits of Automated Remittance in Large Healthcare Networks. Journal for Research in Applied Sciences and Biotechnology, 1(5), 219–224. https://doi.org/10.55544/jrasb.1.5.25

[23] Chaturvedi, R., & Sharma, S. (2022). Enhancing healthcare staffing efficiency with AI-powered demand management tools. Eurasian Chemical Bulletin, 11(Regular Issue 1), 675-681. https://doi.org/10.5281/zenodo.13268360

[24] Dr. Saloni Sharma, & Ritesh Chaturvedi. (2017). Blockchain Technology in Healthcare Billing: Enhancing Transparency and Security. International Journal for Research Publication and Seminar, 10(2), 106–117. Retrieved from https://jrps.shodhsagar.com/index.php/j/article/view/1475

[25] Saloni Sharma. (2020). AI-Driven Predictive Modelling for Early Disease Detection and Prevention. International Journal on Recent and Innovation Trends in Computing and Communication, 8(12), 27–36. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/11046

[26] Chaturvedi, R., & Sharma, S. (2022). Assessing the Long-Term Benefits of Automated Remittance in Large Healthcare Networks. Journal for Research in Applied Sciences and Biotechnology, 1(5), 219–224. https://doi.org/10.55544/jrasb.1.5.25

[27] Pavan Ogeti, Narendra Sharad Fadnavis, Gireesh Bhaulal Patil, Uday Krishna Padyana, Hitesh Premshankar Rai. (2022). Blockchain Technology for Secure and Transparent Financial Transactions. European Economic Letters (EEL), 12(2), 180–188. Retrieved from https://www.eelet.org.uk/index.php/journal/article/view/1283

[28] Fadnavis, N. S., Patil, G. B., Padyana, U. K., Rai, H. P., & Ogeti, P. (2020). Machine learning applications in climate modeling and weather forecasting. NeuroQuantology, 18(6), 135-145. https://doi.org/10.48047/nq.2020.18.6.NQ20194

ISSN: 2583-4053
Volume-1 Issue-4 || October 2022 || PP. 209-214
https://doi.org/10.55544/jrasb.1.4.31

[29] Narendra Sharad Fadnavis. (2021). Optimizing Scalability and Performance in Cloud Services: Strategies and Solutions. International Journal on Recent and Innovation Trends in Computing and Communication, 9(2), 14–21. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10889

[30] Gireesh Bhaulal Patil. (2022). AI-Driven Cloud Services: Enhancing Efficiency and Scalability in Modern Enterprises. International Journal of Intelligent Systems and Applications in Engineering, 10(1), 153–162. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6728

[31] Patil, G. B., Padyana, U. K., Rai, H. P., Ogeti, P., & Fadnavis, N. S. (2021). Personalized marketing strategies through machine learning: Enhancing customer engagement. Journal of Informatics Education and Research, 1(1), 9. http://jier.org

[32] Krishnateja Shiva. (2022). Leveraging Cloud Resource for Hyperparameter Tuning in Deep Learning Models. International Journal on Recent and Innovation Trends in Computing and Communication, 10(2), 30–35. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10980

[33] Shiva, K., Etikani, P., Bhaskar, V. V. S. R., Palavesh, S., & Dave, A. (2022). The rise of robo-advisors: AI-powered investment management for everyone. Journal of Namibian Studies, 31, 201-214.

[34] Bhaskar, V. V. S. R., Etikani, P., Shiva, K., Choppadandi, A., & Dave, A. (2019). Building explainable AI systems with federated learning on the cloud. Journal of Cloud Computing and Artificial Intelligence, 16(1), 1–14.

[35] Ogeti, P., Fadnavis, N. S., Patil, G. B., Padyana, U. K., & Rai, H. P. (2022). Blockchain technology for secure and transparent financial transactions. European Economic Letters, 12(2), 180-192. http://eelet.org.uk

[36] Vijaya Venkata Sri Rama Bhaskar, Akhil Mittal, Santosh Palavesh, Krishnateja Shiva, Pradeep Etikani. (2020). Regulating AI in Fintech: Balancing Innovation with Consumer Protection. European Economic Letters (EEL), 10(1). https://doi.org/10.52783/eel.v10i1.1810

[37] Dave, A., Shiva, K., Etikani, P., Bhaskar, V. V. S. R., & Choppadandi, A. (2022). Serverless AI: Democratizing machine learning with cloud functions. Journal of Informatics Education and Research, 2(1), 22-35. http://jier.org

[38] Dave, A., Etikani, P., Bhaskar, V. V. S. R., & Shiva, K. (2020). Biometric authentication for secure mobile payments. Journal of Mobile Technology and Security, 41(3), 245-259.

[39] Saoji, R., Nuguri, S., Shiva, K., Etikani, P., & Bhaskar, V. V. S. R. (2021). Adaptive AI-based deep learning models for dynamic control in software-defined networks. International Journal of Electrical and Electronics Engineering (IJEEE), 10(1), 89–100. ISSN (P): 2278–9944; ISSN (E): 2278–9952

[40] Narendra Sharad Fadnavis. (2021). Optimizing Scalability and Performance in Cloud Services: Strategies and Solutions. International Journal on Recent and Innovation Trends in Computing and Communication, 9(2), 14–21. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10889

[41] Nitin Prasad. (2022). Security Challenges and Solutions in Cloud-Based Artificial Intelligence and Machine Learning Systems. International Journal on Recent and Innovation Trends in Computing and Communication, 10(12), 286–292. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10750

[42] Prasad, N., Narukulla, N., Hajari, V. R., Paripati, L., & Shah, J. (2020). AI-driven data governance framework for cloud-based data analytics. Volume 17, (2), 1551-1561.

[43] Big Data Analytics using Machine Learning Techniques on Cloud Platforms. (2019). International Journal of Business Management and Visuals, ISSN: 3006-2705, 2(2), 54-58. https://ijbmv.com/index.php/home/article/view/76

[44] Shah, J., Narukulla, N., Hajari, V. R., Paripati, L., & Prasad, N. (2021). Scalable machine learning infrastructure on cloud for large-scale data processing. Tuijin Jishu/Journal of Propulsion Technology, 42(2), 45-53.

[45] Narukulla, N., Lopes, J., Hajari, V. R., Prasad, N., & Swamy, H. (2021). Real-time data processing and predictive analytics using cloud-based machine learning. Tuijin Jishu/Journal of Propulsion Technology, 42(4), 91-102

[46] Secure Federated Learning Framework for Distributed Ai Model Training in Cloud Environments. (2019). International Journal of Open Publication and Exploration, ISSN: 3006-2853, 7(1), 31-39. https://ijope.com/index.php/home/article/view/145

[47] Paripati, L., Prasad, N., Shah, J., Narukulla, N., & Hajari, V. R. (2021). Blockchain-enabled data analytics for ensuring data integrity and trust in AI systems. International Journal of Computer Science and Engineering (IJCSE), 10(2), 27–38. ISSN (P): 2278–9960; ISSN (E): 2278–9979.

[48] Challa, S. S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2019). Investigating the use of natural language processing (NLP) techniques in automating the extraction of regulatory requirements from unstructured data sources. Annals of Pharma Research, 7(5),

[49] Challa, S. S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2021). Navigating regulatory requirements for complex dosage forms: Insights from topical, parenteral, and ophthalmic products. NeuroQuantology, 19(12), 15.

[50] Challa, S. S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2022). Quality management systems in regulatory affairs: Implementation challenges and solutions. Journal for Research in Applied Sciences and Biotechnology, 1(3),

ISSN: 2583-4053
Volume-1 Issue-4 || October 2022 || PP. 209-214
https://doi.org/10.55544/jrasb.1.4.31

[51] Tilala, M., & Chawda, A. D. (2020). Evaluation of compliance requirements for annual reports in pharmaceutical industries. NeuroQuantology, 18(11), 27.
[52] Ghavate, N. (2018). An Computer Adaptive Testing Using Rule Based. Asian Journal For Convergence In Technology (AJCT) ISSN -2350-1146, 4(I). Retrieved from http://asianssr.org/index.php/ajct/article/view/443
[53] Shanbhag, R. R., Dasi, U., Singla, N., Balasubramanian, R., & Benadikar, S. (2020). Overview of cloud computing in the process control industry. International Journal of Computer Science and Mobile Computing, 9(10), 121-146. https://www.ijcsmc.com
[54] Benadikar, S. (2021). Developing a scalable and efficient cloud-based framework for distributed machine learning. International Journal of Intelligent Systems and Applications in Engineering, 9(4), 288. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6761
[55] Shanbhag, R. R., Benadikar, S., Dasi, U., Singla, N., & Balasubramanian, R. (2022). Security and privacy considerations in cloud-based big data analytics. Journal of Propulsion Technology, 41(4), 62-81.
[56] Shanbhag, R. R., Balasubramanian, R., Benadikar, S., Dasi, U., & Singla, N. (2021). Developing scalable and efficient cloud-based solutions for ecommerce platforms. International Journal of Computer Science and Engineering (IJCSE), 10(2), 39-58.
[57] Tripathi, A. (2020). AWS serverless messaging using SQS. IJIRAE: International Journal of Innovative Research in Advanced Engineering, 7(11), 391-393.
[58] Tripathi, A. (2019). Serverless architecture patterns: Deep dive into event-driven, microservices, and serverless APIs. International Journal of Creative Research Thoughts (IJCRT), 7(3), 234-239. Retrieved from http://www.ijcrt.org
[59] Tripathi, A. (2022). Serverless deployment methodologies: Smooth transitions and improved reliability. IJIRAE: International Journal of Innovative Research in Advanced Engineering, 9(12), 510-514.
[60] Tripathi, A. (2022). Deep dive into Java tiered compilation: Performance optimization. International Journal of Creative Research Thoughts (IJCRT), 10(10), 479-483. Retrieved from https://www.ijcrt.org
[61] Thakkar, D. (2021). Leveraging AI to transform talent acquisition. International Journal of Artificial Intelligence and Machine Learning, 3(3), 7. https://www.ijaiml.com/volume-3-issue-3-paper-1/
[62] Thakkar, D. (2020, December). Reimagining curriculum delivery for personalized learning experiences. International Journal of Education, 2(2), 7. Retrieved from https://iaeme.com/Home/article_id/IJE_02_02_003
[63] Kanchetti, D., Munirathnam, R., & Thakkar, D. (2019). Innovations in workers compensation: XML shredding for external data integration. Journal of Contemporary Scientific Research, 3(8). ISSN (Online) 2209-0142.
[64] Thakkar, D., Kanchetti, D., & Munirathnam, R. (2022). The transformative power of personalized customer onboarding: Driving customer success through data-driven strategies. Journal for Research on Business and Social Science, 5(2). ISSN (Online) 2209-7880. Retrieved from https://www.jrbssonline.com
[65] Aravind Reddy Nayani, Alok Gupta, Prassanna Selvaraj, Ravi Kumar Singh, & Harsh Vaidya. (2019). Search and Recommendation Procedure with the Help of Artificial Intelligence. International Journal for Research Publication and Seminar, 10(4), 148–166. https://doi.org/10.36676/jrps.v10.i4.1503
[66] Vaidya, H., Nayani, A. R., Gupta, A., Selvaraj, P., & Singh, R. K. (2020). Effectiveness and future trends of cloud computing platforms. Tuijin Jishu/Journal of Propulsion Technology, 41(3). Retrieved from https://www.journal-propulsiontech.com
[67] Selvaraj, P. . (2022). Library Management System Integrating Servlets and Applets Using SQL Library Management System Integrating Servlets and Applets Using SQL database. International Journal on Recent and Innovation Trends in Computing and Communication, 10(4), 82–89. https://doi.org/10.17762/ijritcc.v10i4.11109
[68] Gupta, A., Selvaraj, P., Singh, R. K., Vaidya, H., & Nayani, A. R. (2022). The Role of Managed ETL Platforms in Reducing Data Integration Time and Improving User Satisfaction. Journal for Research in Applied Sciences and Biotechnology, 1(1), 83–92. https://doi.org/10.55544/jrasb.1.1.12
[69] Alok Gupta. (2021). Reducing Bias in Predictive Models Serving Analytics Users: Novel Approaches and their Implications. International Journal on Recent and Innovation Trends in Computing and Communication, 9(11), 23–30. Retrieved from https://ijritcc.org/index.php/ijritcc/article/view/11108
[70] Rinkesh Gajera , "Leveraging Procore for Improved Collaboration and Communication in Multi-Stakeholder Construction Projects", International Journal of Scientific Research in Civil Engineering (IJSRCE), ISSN : 2456-6667, Volume 3, Issue 3, pp.47-51, May-June.2019
[71] Voddi, V. K. R., & Konda, K. R. (2021). Spatial distribution and dynamics of retail stores in New York City. Webology, 18(6). Retrieved from https://www.webology.org/issue.php?volume=18&issue=60
[72] Gudimetla, S. R. (2022). Ransomware prevention and mitigation strategies. Journal of Innovative Technologies, 5, 1-19.
[73] Gudimetla, S. R., et al. (2015). Mastering Azure AD: Advanced techniques for enterprise identity management. Neuroquantology, 13(1), 158-163. https://doi.org/10.48047/nq.2015.13.1.792
[74] Gudimetla, S. R., & et al. (2015). Beyond the barrier: Advanced strategies for firewall implementation and management. NeuroQuantology, 13(4), 558-565. https://doi.org/10.48047/nq.2015.13.4.876