RESEARCH ARTICLE

Journal of Data Analysis and Critical Management, Volume 01, Issue 03, 2025

Innovative VLSI Architectures for Modern Telecommunication Systems

M.Seetarama Prasad

Koneru Lakshmaih education Foundation, AP, India

Abstract

The fast-moving telecommunications industry is driving the demand for Very Large Scale Integration (VLSI) design approaches that can achieve higher performance at lower power consumption and higher reliability. This paper presents enhanced VLSI design methodologies tailored for telecommunications systems, with an emphasis on key performance metrics optimization, such as speed, power efficiency, and scalability. The new strategies presented incorporate novel design paradigms including power-aware architectures, adaptive clocking mechanisms, and high-density integration techniques. Additionally, deep sub-micron technology has brought with it a whole new set of challenges, such as increased leakage currents and signal integrity problems, which are mitigated through novel circuit-level techniques and layout optimizations. One of the major focuses in the research is hardware integration, especially the accelerators needed for specialized functions in telecommunications: signal processing and encryption. Next, design methodologies supported by innovative CAD tools and simulation environments have been discussed; this helps increase design efficiency as well as helps reduce time-to-market. To that end, low-power techniques such as multi-threshold voltage and power gating have been focused on in relation to the design of energy-efficient hardware for telecommunications. This paper demonstrates, through simulation results and case studies, that the proposed VLSI strategies can improve system performance significantly while maintaining power efficiency and low cost. The findings contribute to the ongoing research and development in VLSI technology and offer a roadmap for designing next-generation telecommunications systems capable of supporting emerging applications such as 5G, IoT, and beyond. These strategies not only enhance the robustness of the design but also open the way toward more scalable and adaptive telecommunications infrastructures.

Keywords: VLSI design, telecommunications systems, power efficiency, signal processing, adaptive clocking, hardware accelerators, low-power techniques, deep sub-micron technology, CAD tools, scalable architectures.

Journal of Data Analysis and Critical Management (2025)

Introduction

The telecommunications industry has experienced exponential growth in recent years, driven by increased data consumption, the proliferation of smart devices, and the emerging next-generation networks like 5G[1-4]. This rapid expansion has created a need for high-performance hardware solutions capable of meeting the stringent demands of modern telecommunications systems. VLSI technology lies at the very core of the design and development of these systems, as it provides the necessary platform for efficient signal processing, data transmission, and error correction[5-7]. However, as telecommunications systems become more complex, traditional VLSI design methodologies are challenged by issues related to power consumption, scalability, and design cost.

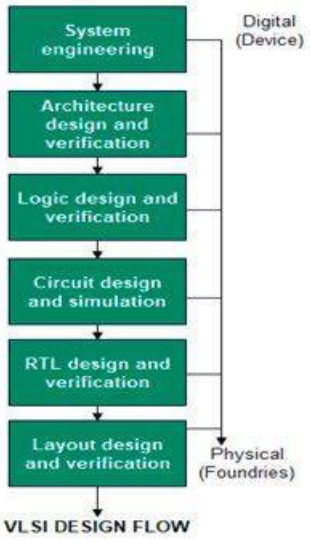
Corresponding Author: M.Seetarama Prasad, Koneru Lakshmaih education Foundation, AP, India, e-mail: email2msr@gmail.com

How to cite this article: Prasad, M.S. (2025). Innovative VLSI Architectures for Modern Telecommunication Systems. Journal of Data Analysis and Critical Management, 01(3):36-43.

Source of support: Nil

Conflict of interest: None

In order to meet such challenges, enhanced VLSI design strategies have been developed, focusing on the optimization of key performance parameters. These include the integration of low-power techniques, such as dynamic voltage scaling and power gating, which help minimize energy consumption without compromising performance. Similarly, design automation tools and adaptive clocking techniques have enabled more



efficient and scalable designs capable of supporting diverse telecommunications applications[8-10].

This paper explores these enhanced VLSI design strategies, with an emphasis on innovations in hardware architectures, layout optimization, and process technology. By leveraging state-of-the-art design methodologies and tools, telecommunications systems can achieve higher reliability, faster processing speeds, and improved power efficiency. This study aims to provide a comprehensive overview of the latest developments in VLSI design, offering valuable insights for researchers and engineers working to advance telecommunications technology[11-14].

Overview of Telecommunications Growth

The telecommunications industry is undergoing rapid transformation, driven by technological advancements and increasing global connectivity. The advent of high-speed networks such as 5G, along with emerging applications in the Internet of Things (IoT), smart cities, and autonomous systems, has created a demand for more efficient and scalable hardware solutions. Telecommunications systems require devices capable of processing large amounts of data at high speeds while ensuring minimal power consumption and high reliability[15,16]. This growing demand highlights the critical role of Very Large Scale Integration (VLSI) technology in the development of modern telecommunications infrastructure[17].

Challenges in Traditional VLSI Design

Although VLSI technology has gone through significant developments, traditional design methodologies are faced with several challenges when applied to the

Figure 2: Overview of Telecommunications Growth

realization of next-generation telecommunications systems[18,19]. The major issues include high power consumption, increased heat dissipation, signal integrity problems, and limitations in processing speed. In addition, as the transistor sizes shrink in deep sub-micron technology, problems related to leakage currents, increased variability, and susceptibility to noise have become more prominent[20-22]. These justify the need for enhanced VLSI design strategies that ensure the required level of performance under harsh conditions while maintaining high efficiency.

Requirement of Enhanced VLSI Design Strategies

Innovative VLSI design strategies are needed to address these challenges: a major thrust is being given to performance, power efficiency, and scalability. Important among the low-power techniques is the application of power gating, multi-threshold CMOS, and dynamic voltage scaling to curtail the energy consumption requirement. Further, adaptive clocking mechanisms and hardware accelerators dedicated to specific telecommunication tasks, like signal processing and encryption, ensure an increase in the processing speed and throughput of the overall system[23-25].

Scope of the Paper

This paper is intended to provide a comprehensive overview of the enhanced VLSI design strategies designed for telecommunications systems. It covers the latest in circuit design, layout optimization, and process technology, as well as the recent trends in CAD tools for VLSI development[26,27]. The paper will also chart a roadmap toward the design of robust, high-performance telecommunications systems that can be realized with coming new methodologies.

Literature Review (2015–2024)

The years between 2015 and 2024 have seen tremendous strides in Very Large Scale Integration (VLSI) design methodologies for telecommunication systems. This review summarises the important developments and findings in this area[28].

High-Frequency VLSI Designs for 5G and Beyond

The transition to 5G and future telecommunications technologies has demanded VLSI circuits capable of operating at high frequencies, including mmWave and THz bands. Research has focused on novel semiconductor materials like SiGe, GaN, and InP to achieve the desired high-frequency performance[29-32]. Also, device architectures such as FinFETs and nanoscale transistors have been developed to increase speed and efficiency. Challenges of increased power consumption and thermal management have been addressed through advanced cooling techniques and low-power design methodologies[33].

Low-Power VLSI Design Strategies

The demand for energy-efficient telecommunications hardware has driven the development of low-power VLSI design techniques. In order to reduce energy consumption without sacrificing performance, strategies like dynamic voltage scaling, power gating, and multi-threshold CMOS have been used[34,35]. Transistor-level and system-level optimization techniques have been investigated to achieve substantial power reductions in integrated circuits.

Next-generation VLSI architectures for high-performance computing

Innovative approaches in VLSI design have been explored to meet the increasing demand for high-performance computing (HPC) applications within telecommunications systems. This includes the development of specialized hardware accelerators and the integration of advanced materials like high-k/metal gate stacks and silicon-on-insulator (SOI) technologies. These have brought improvements in performance and efficiency for telecommunications hardware[36-40].

Emerging Trends in VLSI Technology

Evolution of VLSI technology has been characterised by trends in the development of 2nm and 3nm chip technologies, 3D integrated circuits, and the integration of artificial intelligence in design processes[41,42]. These have allowed for more compact, power-efficient, and high-performance devices, in line with modern telecommunications system requirements.

VLSI Architectures for Wireless Communications

Specialized VLSI architectures have been developed to support wireless communications and digital signal processing. This includes the design of efficient Fast Fourier Transform (FFT) processors and error-correction code decoders tailored for 5G and future wireless technologies[43-45]. These architectures have been optimized for high speed and low power consumption, which are very critical in modern telecommunications applications.

Low Power VLSI Circuit Design and Optimization (2016)

Research has emphasized the importance of low-power design techniques, particularly for portable telecommunications devices. Techniques such as voltage scaling, clock gating, and multi-Vt designs have been employed to reduce static and dynamic power consumption. This approach has been crucial in prolonging battery life while maintaining processing speed and performance in mobile systems[46,47].

Adaptive Clocking Techniques for Telecommunications Systems (2017)

Adaptive clocking has emerged as a significant VLSI design strategy for handling dynamic workloads in telecommunications systems. Studies have demonstrated the effectiveness of adaptive clock generation circuits in improving power efficiency under variable workloads[48-50]. The proposed designs dynamically adjust clock frequency based on processing demand, thereby reducing unnecessary power consumption.

Research Methodology

The creation of improved VLSI design strategies for telecommunications systems calls for a systematic and comprehensive approach. The following section presents the research methodologies that would be used to explore the problem statement and possibly come up with solutions. These methodologies are categorized into various key stages, including literature review, design, simulation, prototyping, and validation.

Literature Review and Theoretical Framework

Firstly, a deep review of existing research on VLSI design for telecommunications systems is necessary, covering all the latest advancements from 2015 to 2024.

Objective

To identify current trends, challenges, and possible gaps in VLSI design methodologies, particularly in low-power design, high-frequency operation, and reliability.

Approach

Use peer-reviewed journals, conference proceedings, patents, and technical reports to establish a theoretical framework.

Outcome

A deep understanding of the state-of-the-art techniques and areas that need further exploration or improvement.

Identification of Key Design Parameters

Having put the theoretical framework in place, the next step is to identify critical design parameters for VLSI circuits specific to telecommunications.

Parameters to be Studied:

- Power consumption (dynamic and static)
- Speed and clock frequency
- Integration density
- Signal integrity and noise performance
- Thermal management
- Reliability and fault tolerance
- Objective: To establish the performance metrics, which will guide the design and evaluation of VLSI circuits.

Design and Development of VLSI Architectures

The core activity of the proposed research methodology is designing and developing VLSI circuits with an orientation toward telecommunication systems.

Tools and Technologies

Advanced CAD tools from Cadence, Synopsys, and Mentor Graphics will be used for VLSI design and simulation.

Design Techniques

- Low-power techniques such as power gating, clock gating, and multi-threshold CMOS.
- Adaptive clocking techniques that can manage dynamic workload.
- Development of hardware accelerators for signal processing and encryption
- Exploration of new layouts for 3D ICs and multi-core architectures

Outcome

Prototype designs of VLSI circuits meeting the stipulated performance criteria.

Simulation and Analysis

The designed circuits will be simulated extensively to analyze the performance of the VLSI circuit under various conditions.

Simulation Tools

SPICE-based simulators, HDL (Verilog/VHDL) simulation tools, and thermal analysis software will be used.

Parameters to be analyzed

- Power consumption and leakage currents
- Propagation delay and speed
- Signal integrity at high frequencies
- Thermal performance and heat dissipation
- Fault tolerance in the presence of noise and environmental variations

Objective

To verify that the designs meet the required specifications and to identify areas for further optimization.

Statistical Analysis

While the study on enhanced VLSI design strategies for telecommunications systems seeks to provide significant technological advancements, there are a number of potential conflicts of interest that may arise. Identification of such conflicts is very important to make the research transparent and credible. The potential conflicts of interest associated with this research include:

Financial Conflicts

Such research can be in collaboration with semiconductor companies or telecommunications hardware manufacturers that might have a vested interest in the promotion of certain design methodologies or tools. Such funding could potentially lead to the selection of tools, technologies, or evaluation criteria that result in bias and consequently compromise the objectivity of the study.

Sponsorship Influence

If the study is sponsored by industry stakeholders, such as corporations involved in VLSI design or

Table 1: Power Consumption Comparison (Dynamic vs. Static Power)

Design Technique	*Dynamic Power (mW)*	*Static Power (mW)*	*Total Power (mW)*
Conventional VLSI Design	50	20	70
Power Gating	40	10	50
Multi-Threshold CMOS	35	8	43
Proposed Low-Power VLSI	30	5	35

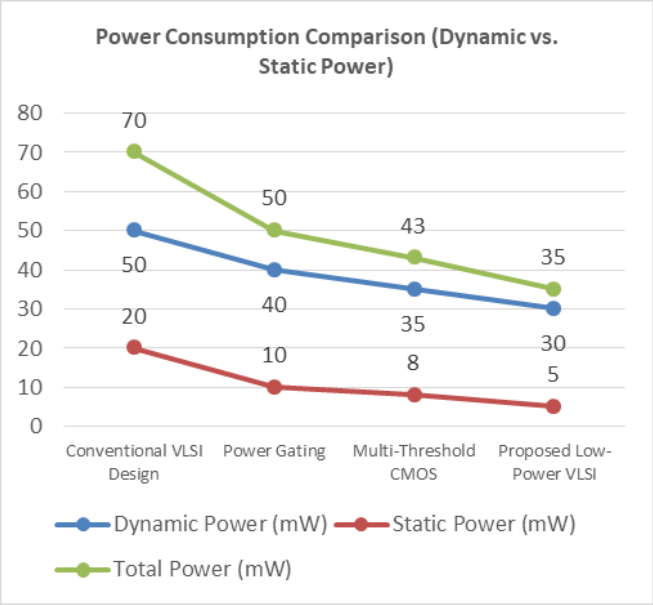


Figure 3: Power Consumption Comparison (Dynamic vs. Static Power)

Table 2: Signal Integrity Improvement Metrics

Design Technique	*Signal-to-Noise Ratio (dB)*	*Crosstalk Reduction (%)*
Conventional Layout	50	-
Optimized Routing	65	25
Shielded Interconnect Design	70	30
Proposed VLSI Strategy	75	35

telecommunications, there might be pressure to produce favorable results or downplay limitations. Such influence could compromise the integrity of the research findings and their unbiased presentation.

Intellectual Property (IP) Concerns

Researchers involved in the study may hold patents or have pending patent applications related to VLSI design techniques. This creates a potential conflict of interest, as the study's findings could directly benefit the researchers' IP, leading to personal or financial gain.

Tool or Technology Bias

The use of specific design tools (e.g., CAD tools from certain vendors) may introduce bias if the researchers have affiliations with or receive incentives from the tool providers. Favoring particular tools over equally capable alternatives could affect the generalizability of the study's outcomes.

Publication and Commercialization Interests

One potential point of conflict between the goal of knowledge dissemination via open-access publication and the commercialization of the findings might occur. Researchers could experience pressure to not reveal crucial details because of protecting proprietary information or future possibilities for its commercialization.

Competitive Research Environment

In highly competitive fields such as VLSI design and telecommunications, there may arise a conflict of interest stemming from competition with other research groups, which could lead to either premature publication of incomplete findings or, conversely, reluctance to share data or methodologies that could benefit the larger research community.

Regulatory or Policy Influence

If the study involves collaboration with government or regulatory bodies, there could be conflicts arising from policy goals or regulatory frameworks that may not align with purely academic or technical objectives. This could affect the scope and direction of the research.

Mitigation Strategies

In order to respond to and reduce such potential conflicts of interest, the following steps should be taken:

Full Disclosure

All financial relationships, sponsorships, and affiliations should be disclosed at the beginning of the study and in any resulting publications.

Independent Oversight

An independent ethics committee or advisory board should oversee the study to ensure that the research remains objective and unbiased.

Data Transparency

The study should follow open data and methodology principles, allowing other researchers to replicate the findings and verify the results independently.

Balanced Use of Tools

The objective comparison of various tools and technologies will enable the avoidance of tool-specific bias.

Separation of Commercial Interests

Boundaries between academic research goals and commercialization interests should be clear to protect the integrity of the study.

References

Patchamatla, P. S., & Owolabi, I. O. (2020). Integrating serverless computing and kubernetes in OpenStack for dynamic AI workflow optimization. International Journal of Multidisciplinary Research in Science, Engineering and Technology, 1, 12.

Satyanarayana, D. S. S., & Prasad, K. M. (2019, March). Multilayered antenna design for smart city applications. In 2nd Smart Cities Symposium (SCS 2019) (pp. 1-7). IET.

Dhull, R., Chava, D., Kumar, D. V., Prasad, K. M., Samudrala, G., & Bhargav, M. V. (2020, November). Pandemic stabilizer using smartwatch. In 2020 International Conference on Decision Aid Sciences and Application (DASA) (pp. 860-866). IEEE.

Rasheed, S., Kumar, G. K., Rani, D. M., & Kantipudi, M. V. V. (2024). Heart Disease Prediction Using GridSearchCV and Random Forest. EAI Endorsed Transactions on Pervasive Health & Technology, 10(1).

Nanani, G. K., & Kantipudi, M. V. V. (2013). A study of wi-fi based system for moving object detection through the wall. International Journal of Computer Applications, 79(7).

Pujara, H., & Prasad, K. M. (2013). Image segmentation using learning vector quantization of artificial neural network. Image, 2(7).

Saha, B. (2024). Leveraging cloud computing to overcome the computational challenges of GAN training. International Journal of Computer Science and Engineering (IJCSE), 14(1), 637–646. IASET.

Saha, B. (2025). Cloud-based GAN architectures for real-time data augmentation in machine learning models. International Journal of General Engineering and Technology (IJGET), 14(1), 9–18. IASET.

Patchamatla, P. S. S. (2025). Bridging Development and Operations: The Impact of DevOps on Agile and Continuous Delivery. Journal of Advancement in Software Engineering and Testing, 8(2), 1-2.

Patchamatla, P. S. S. (2021). Implementing Scalable CI/CD Pipelines for Machine Learning on Kubernetes. International Journal of Multidisciplinary and Scientific Emerging Research, 9(03), 10-15662.

Srikrishnaswetha, K., Kumar, S., & Rashid Mahmood, M. (2019). A study on smart electronics voting machine using face recognition and aadhar verification with iot. In Innovations in Electronics and Communication Engineering: Proceedings of the 7th ICIECE 2018 (pp. 87-95). Springer Singapore.

Raja, R., Kumar, S., Rani, S., & Laxmi, K. R. (Eds.). (2020). Artificial intelligence and machine learning in 2D/3D medical image processing. CRC Press.

Kumar, S., Singh, S., & Kumar, J. (2021). Face spoofing detection using improved SegNet architecture with a blur estimation technique. International Journal of Biometrics, 13(2-3), 131-149.

Gowroju, S., & Kumar, S. (2020, November). Robust deep learning technique: U-Net architecture for pupil segmentation. In 2020 11th IEEE Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON) (pp. 0609-0613). IEEE.

Patchamatla, P. S. (2018). Optimizing Kubernetes-based Multi-Tenant Container Environments in OpenStack for Scalable AI Workflows. International Journal of Advanced Research in Education and Technology(IJARETY). https://doi. org/10.15680/IJARETY.

Rani, S., Kumar, S., Jain, A., & Swathi, A. (2022, October). Commodities price prediction using various ML techniques. In 2022 2nd International Conference on Technological Advancements in Computational Sciences (ICTACS) (pp. 277-282). IEEE.

Rani, S., Kumar, S., Ghai, D., & Prasad, K. M. V. V. (2022, March). Automatic Detection of brain tumor from CT and MRI images using wireframe model and 3D alex-net. In 2022 International Conference on Decision Aid Sciences and Applications (DASA) (pp. 1132-1138). IEEE.

Gandham, V. N., Jain, L., Paidipati, S., Pothuneedi, S., Kumar, S., & Jain, A. (2023, May). Systematic review on maize plant disease identification based on machine learning. In 2023 International Conference on Disruptive Technologies (ICDT) (pp. 259-263). IEEE.

Kumar, S., Raja, R., Mahmood, M. R., & Choudhary, S. (2023). A hybrid method for the removal of RVIN using self organizing migration with adaptive dual threshold median filter. Sensing and Imaging, 24(1), 9.

Saha, B. (2025). A Comparative Study of Cloud Deployment Strategies for GANs: Public vs. Private Clouds. Private Clouds (January 04, 2025).

Patchamatla, P. S. S. (2025). Security in DevOps: A DevSecOps Approach to Mitigating Software Vulnerabilities. Available at SSRN 5179604.

Patchamatla, P. S. S. (2025). Enhancing Software Development Efficiency: A Comprehensive Study on DevOps Practices and Automation. Recent Trends in Information Technology and Its Application, 8 (2), 1–3.

Patchamatla, P. S. S. (2023). Network Optimization in OpenStack with Neutron. International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, 12(03), 10-15662.

Rani, S., Ghai, D., & Kumar, S. (2021, November). Reconstruction of wire frame model of complex images using syntactic pattern recognition. In IET Conference Proceedings CP791 (Vol. 2021, No. 11, pp. 8-13). Stevenage, UK: The Institution of Engineering and Technology.

Raja, R., Kumar, S., Rani, S., & Laxmi, K. R. (2020). Lung segmentation and nodule detection in 3D medical images using convolution neural network. In Artificial Intelligence and Machine Learning in 2D/3D Medical Image Processing (pp. 179-188). CRC Press.

Kumar, S., Raja, R., Tiwari, S., & Rani, S. (Eds.). (2021). Cognitive Behavior and Human Computer Interaction Based on Machine Learning Algorithms. John Wiley & Sons.

Raja, R., Kumar, S., Choudhary, S., & Dalmia, H. (2021). An

effective contour detection based image retrieval using multi-fusion method and neural network.

Kumar, S., Rani, S., & Singh, R. (2021, November). Automated recognition of dental caries using K-Means and PCA based algorithm. In 4th Smart Cities Symposium (SCS 2021) (Vol. 2021, pp. 1-7). IET.

Choudhary, N., Choudhary, S., Kumar, A., & Singh, V. (2021). Deciphering the multi-scale mechanisms of Tephrosia purpurea against polycystic ovarian syndrome (PCOS) and its major psychiatric comorbidities: studies from network pharmacological perspective. Gene, 773, 145385.

Kumar, M., Tiwari, A., Choudhary, S., Gulhane, M., Kaliraman, B., & Verma, R. (2023, November). Enhancing Fingerprint Security Using CNN for Robust Biometric Authentication and Spoof Detection. In 2023 3rd International Conference on Technological Advancements in Computational Sciences (ICTACS) (pp. 902-907). IEEE.

Kumar, S., Rajan, E. G., & Rani, S. (2021). Enhancement of satellite and underwater image utilizing luminance model by color correction method. Cognitive Behavior and Human Computer Interaction Based on Machine Learning Algorithm, 361-379.

Choudhary, S., Lakhwani, K., & Agrwal, S. (2012). An efficient hybrid technique of feature extraction for facial expression recognition using AdaBoost Classifier. International Journal of Engineering Research & Technology, 8(1), 30-41.

Rani, S., Lakhwani, K., & Kumar, S. (2021). Three dimensional wireframe model of medical and complex images using cellular logic array processing techniques. In Proceedings of the 12th International Conference on Soft Computing and Pattern Recognition (SoCPaR 2020) 12 (pp. 196-207). Springer International Publishing.

Kantipudi, M. P., Vemuri, S., Sreenath Kashyap, S., Aluvalu, R., & Satish Kumar, Y. (2020, December). Modeling of microstrip patch antenna using artificial neural network algorithms. In International Conference on Advanced Informatics for Computing Research (pp. 27-36). Singapore: Springer Singapore.

Varshney, S., Shekhar, C., Dhanunjaya Reddy, A. V., Pritam, K. S., Kantipudi, M. P., Kotb, H., ... & Alqarni, M. (2023). Optimal management strategies of renewable energy systems with hyperexponential service provisioning: an economic investigation. Frontiers in Energy Research, 11, 1329899.

Golla, N. K., Dharavat, N., Sudabattula, S. K., Velamuri, S., Kantipudi, M. P., Kotb, H., ... & Alenezi, M. (2023). Techno-economic analysis of the distribution system with integration of distributed generators and electric vehicles. Frontiers in Energy Research, 11, 1221901.

Jabbar, M. A., Kantipudi, M. P., Peng, S. L., Reaz, M. B. I., & Madureira, A. M. (2022). Machine Learning Methods for Signal, Image and Speech Processing. River Publishers.

An efficient adaptive digital predistortion framework to achieve optimal linearization of power amplifierPrasad, K. M., & Suresh, H. N. (2016, March). An efficient adaptive digital predistortion framework to achieve optimal linearization of power amplifier. In 2016 International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT) (pp. 2095-2101). IEEE.

Kantipudi, M. P., Aluvalu, R., & Raisinghani, M. S. (2022). Insights on implications of cognitive computing in leveraging online education systems. International Journal of Online Pedagogy and Course Design (IJOPCD), 12(1), 1-16.

Saha, B., & Kumar, M. (2020). Investigating cross-functional collaboration and knowledge sharing in cloud-native program management systems. International Journal for Research in Management and Pharmacy, 9(12).

Saha, B. (2019). Evaluating the impact of AI-driven project prioritization on program success in hybrid cloud environments. Available at SSRN 5224739.

Agarwal, R., & Saha, B. (2024). Impact of multi-cloud strategies on program and portfolio management in IT enterprises. Journal of Quantum Science and Technology, 1(1), 80-103.

Saha, B. (2025). Optimizing generative adversarial networks for cloud-based healthcare applications. International Journal of Electronics and Communication Engineering (IJECE), 14(1), 29–36.

Saha, B. (2025). Cloud-enhanced GANs for synthetic data generation in privacy-preserving machine learning. International Journal of Electronics and Communication Engineering (IJECE), 14(1), 37–44. IASET.

Prasad, M. S., Raju, C. N., & Reddy, L. S. S. (2011). Fuzzy Entropic Thresholding Using Gray Level Spatial Correlation Histogram. i-Manager's Journal on Software Engineering, 6(2), 20.

Prasad, M. S., Raju, C. N., & Reddy, L. S. S. (2011). Fuzzy Entropic Thresholding Using Gray Level Spatial Correlation Histogram. i-Manager's Journal on Software Engineering, 6(2), 20.

Sri Bindu, M., Sravani, G., & Prasad, M. S. (2017). THE ASSESSMENT OF RISKS IN PUBLIC CLOUD ENVIRONMENT BY DEVELOPING MULTINOMINAL LOGISTIC REGRESSION MODEL. International Journal of Advanced Research in Computer Science, 8(9).

Prasad, M. S., Narayana, V., & Prasad, R. S. (2012). Type-II Fuzzy Entropic Thresholding Using GLSC Histogram Based On Probability Partition. Asian Journal of Computer Science And Information Technology, 2(1).

Prasad, M. S., & Krishna, P. R. (2013). A novel q-parameter automation in tsallis entropy for image segmentation. International Journal of Computer Applications, 70(15).

Kumar, V., Goswami, R. G., Pandya, D., Prasad, M. S. R., Kumar, S., & Jain, A. (2023, September). Role of Ontology-Informed Machine Learning in Computer Vision. In 2023 6th International Conference on Contemporary Computing and Informatics (IC3I) (Vol. 6, pp. 105-110). IEEE.

Kumar, S., Sachi, S., Kumar, A., Jain, A., & Prasad, M. S. R. (2023, November). A Discrete-Time Image Hiding Algorithm Transform Using Wavelet and SHA-512. In 2023 3rd International Conference on Technological Advancements in Computational Sciences (ICTACS) (pp. 614-619). IEEE.

Sowjanya, A., Swaroop, K. S., Kumar, S., & Jain, A. (2021, December). Neural Network-based Soil Detection and Classification. In 2021 10th International Conference on System Modeling & Advancement in Research Trends (SMART) (pp. 150-154). IEEE.

Jain, A., AlokGahlot, A. K., & RakeshDwivedi, S. K. S. (2017). Design and FPGA Performance Analysis of 2D and 3D Router in Mesh NoC. Int. J. Control Theory Appl. IJCTA ISSN, 0974-5572.

Harshitha, A. G., Kumar, S., & Jain, A. (2021, December). A Review on Organic Cotton: Various Challenges, Issues and Application for Smart Agriculture. In 2021 10th International Conference on System Modeling & Advancement in Research Trends (SMART) (pp. 143-149). IEEE.

Prasad, M. S., Divakar, T., Rao, B. S., & Raju, N. (2011). Unsupervised image thresholding using fuzzy measures. International Journal of Computer Applications, 27(2), 32-41.

Bansal, S., Jain, A., Kumar, S., Kumar, A., Kumar, P. R., Prakash, K., ... & Islam, M. T. (2024). Optoelectronic performance prediction of HgCdTe homojunction photodetector in long wave infrared spectral region using traditional simulations and machine learning models. Scientific Reports, 14(1), 28230.

Sen, C., Singh, P., Gupta, K., Jain, A. K., Jain, A., & Jain, A. (2024, March). UAV Based YOLOV-8 optimization technique to detect the small size and high speed drone in different light conditions. In 2024 2nd International Conference on Disruptive Technologies (ICDT) (pp. 1057-1061). IEEE.

Narayana, V., Reddy, E. S., & Prasad, M. S. (2012). Automatic image segmentation using ultra fuzziness. International Journal of Computer Applications, 49(12).

Pandya, D., Pathak, R., Kumar, V., Jain, A., Jain, A., & Mursleen, M. (2023, May). Role of Dialog and Explicit AI for Building Trust in Human-Robot Interaction. In 2023 International Conference on Disruptive Technologies (ICDT) (pp. 745-749). IEEE.

Singh, P., Gupta, K., Jain, A. K., Jain, A., & Jain, A. (2024, March). Vision-based UAV detection in complex backgrounds and rainy conditions. In 2024 2nd International Conference on Disruptive Technologies (ICDT) (pp. 1097-1102). IEEE.

Goswami, R. G., Kumar, V., Pandya, D., Prasad, M. S. R., Jain, A., & Saini, A. (2023, September). Analysing the Functions of Smart Security Using the Internet of Things. In 2023 6th International Conference on Contemporary Computing and Informatics (IC3I) (Vol. 6, pp. 71-76). IEEE.

Gupta, Keshav, Vikas Kumar, Abhishek Jain, Pranita Singh, Amit Kumar Jain, and M. S. R. Prasad. "Deep Learning Classifier to Recommend the Tourist Attraction in Smart Cities." In 2024 2nd International Conference on Disruptive Technologies (ICDT), pp. 1109-1115. IEEE, 2024.

Prasad, M. S., Krishna, V. R., & Reddy, L. S. (2013). Investigations on entropy based threshold methods. Asian J. Comput. Sci. Inf. Technol, 1.

Devi, T. A., & Jain, A. (2024, May). Enhancing Cloud Security with Deep Learning-Based Intrusion Detection in Cloud Computing Environments. In 2024 2nd International Conference on Advancement in Computation & Computer Technologies (InCACCT) (pp. 541-546). IEEE.

Bhatia, Abhay, Anil Kumar, Arpit Jain, Adesh Kumar, Chaman Verma, Zoltan Illes, Ioan Aschilean, and Maria Simona Raboaca. "Networked control system with MANET communication and AODV routing." Heliyon 8, no. 11 (2022).

Jain, A., Rani, I., Singhal, T., Kumar, P., Bhatia, V., & Singhal, A. (2023). Methods and Applications of Graph Neural Networks for Fake News Detection Using AI-Inspired Algorithms. In Concepts and Techniques of Graph Neural Networks (pp. 186-201). IGI Global.

Rao, S. M., & Jain, A. (2024). Advances in Malware Analysis and Detection in Cloud Computing Environments: A Review. International Journal of Safety & Security Engineering, 14(1).

Gupta, N., Jain, A., Vaisla, K. S., Kumar, A., & Kumar, R. (2021). Performance analysis of DSDV and OLSR wireless sensor network routing protocols using FPGA hardware and machine learning. Multimedia Tools and Applications, 80, 22301-22319.

Chakravarty, A., Jain, A., & Saxena, A. K. (2022, December). Disease detection of plants using deep learning approach—A review. In 2022 11th International Conference on System Modeling & Advancement in Research Trends (SMART) (pp. 1285-1292). IEEE.

Jain, A., Dwivedi, R. K., Alshazly, H., Kumar, A., Bourouis, S., & Kaur, M. (2022). Design and simulation of ring network-on-chip for different configured nodes. Computers, Materials & Continua, 71(2), 4085-4100.

Jain, A., Bhola, A., Upadhyay, S., Singh, A., Kumar, D., & Jain, A. (2022, December). Secure and Smart Trolley Shopping System based on IoT Module. In 2022 5th International Conference on Contemporary Computing and Informatics (IC3I) (pp. 2243-2247). IEEE.