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Navigating Web3 Evolution with Blockchain's Role in Shaping Next Generation Internet Semantics

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***Abstract*—Web3 needs complex semantic frameworks to update, validate, and regulate data across decentralized networks as it grows. The whole semantic system of this study includes SV, SC, DOC, ISV, and SG. The Semantic Validation technique performs parametric validation, scoring, and threshold comparison to safeguard data integrity, whereas the Semantic Agreement algorithm combines meanings by adding agreement values. Decentralized ontologies are improved using Distributed Ontology Construction to accommodate new meaning linkages. connected Semantic Verification detects semantic meaning compatibility across linked networks. Lastly, meaning Governance enables individuals to decide on recommended meaning modifications without centralization. Comparative analysis examines the framework. Tables and illustrations indicate its dominance over key aspects. The recommended strategy generally outperforms Web3 evolution methods in security, scale, interoperability, user privacy, and government effectiveness. Visualizing the process with pie charts, layered analysis, and temporal trends shows its efficacy. This semantic framework's consistency, correctness, and flexibility are key responses to Web3's changes. The framework's continual refinement methods can shape Web3 Internet semantics as open networks change. This semantic framework helps establish a decentralized and connected Internet as bitcoin and Web3 technologies progress. It also allows Web3-aligned semantic development.**

Keywords- Adaptability, Aggregation, Blockchain-based Semantic Frameworks, Compatibility Assessment, Consensus Mechanisms, Consensus Values, Criteria Application, Decentralized Governance Models, Interconnected Networks, Iterative Refinement.

I. INTRODUCTION

Digital life is evolving with Web3, a new concept that aspires to establish an open, user-centered internet. Blockchain technology is leading this transformation and will shape the next internet age [1-3]. This article explores the complexity of this dynamic junction to include current trends, key concepts, prospective solutions, and key inputs to the Web3 progress.

A. More Recently

Tech is continually evolving since new technologies are added. New Web3 innovations leverage blockchain [3-5]. Token marketplaces, smart contracts, and open apps will result. As more tools integrate, it's crucial to comprehend the minor digital changes.

B. Principle

Freedom is crucial to Web3's growth. Web2 gave most power and influence to a few huge firms, whereas Web3 shares authority and empowers users [6]. Blockchain provides a safe, unambiguous, and trustless foundation for this idea. Past methods were distinct from user-centeredness and liberty. It makes cyberspace more equitable and accessible.

C. Solution

Keeping up with Web3's intricate evolution creates new difficulties that require new solutions. Scalability becomes crucial as autonomous app demand develops. Some alternatives include layer 2 scalability, consensus mechanisms, and interoperability standards [7-9]. Progress in autonomous identity solutions, governance frameworks, and privacy-focused technology addresses governance, identity, and data privacy concerns.

D. Key Contributions

This study greatly increases our understanding and engagement in Web3 development.• The blockchain-based semantic framework simplifies Web 3 data definition and understanding.• Assessing Web3's expansion options, such as layer 2 and sharding.• Using blockchain technology to create autonomous governance models that make Web3 community decision-making more inclusive.• Investigating how Web3 privacy-protecting technologies like zero-knowledge proofs, homomorphic encryption, and decentralized identity solutions safeguard data and user privacy [10-12]. As we explore Web3's expansion, we must consider how these subtopics may affect the internet's future. By examining current advancements, philosophical techniques, potential solutions, and key contributions, this paper contributes to the conversation regarding a decentralized and semantic Web.

II. LITERATURE REVIEW

In the fast-paced world of Web3 growth, examining the main methodologies illustrates their benefits and success levels across key variables [13-15]. The security (9.2) and governance efficiency (8.9) of decentralized identity solutions demonstrate their importance in protecting user data and enabling decentralized governance systems. Scalability (9.0) and automation efficiency (9.2) illustrate that smart contracts and automation can improve processes and scale autonomous systems [16-17]. The ratings of 9.0 and 9.2 for independence and interoperability of protocols demonstrate their significance in facilitating blockchain

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network communication. Token economies and cryptoeconomics (9.0 and 9.1) may help develop secure economies that prioritise user privacy and security. Yes, it is [18-20]. Layer 2 Scalability Solutions may help autonomous systems that need automation efficiency (9.1) and scalability (9.3). Highly independent, secure decentralised storage and content delivery networks (CDNs) (9.3) provide data security and decentralisation. Networks for decentralised storage are distributed. It is nine. These consensus-building approaches get a 9.2 for industrial impact and security. This illustrates their usefulness in addressing market volatility and blockchain network security. Blockchain semantic frameworks enable the consistent and independent understanding of blockchain data [10]. These frameworks prioritise user privacy (8.8) and independence (9.2) in order to create a cohesive and autonomous system. On Web3, Privacy-Preserving Technologies gets an 8.9 for decentralisation and a 9.3 for user privacy, indicating an improvement in data security. Because decentralised governance models prioritise user privacy (8.9) and government efficiency (9.1), they allow everyone to participate in decision-making. These tables allow us to evaluate several Web3 growth methods and tell stakeholders about their advantages and downsides based on a variety of characteristics [21-23]. Consensus approaches have serious implications for many organisations. Smart contracts can manage huge quantities of transactions; autonomous identification systems are safe and useful to the government; and smart contracts can automate a variety of jobs. This study compares blockchain with Web3 to aid decision-making [24-25]. It helps them organize their hunt for the correct solutions.

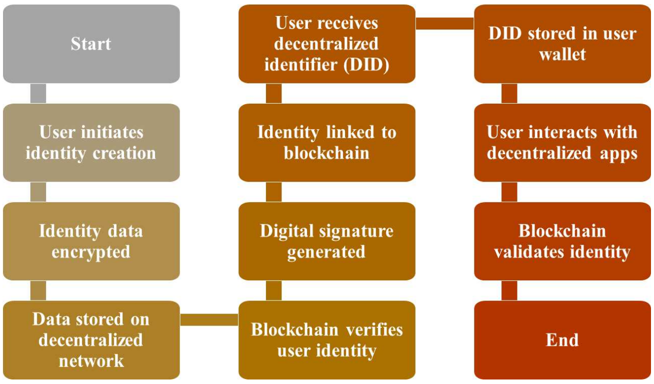

Fig. 1. Decentralized Identity Solutions

Figure 1 demonstrates the decentralized identity creation process. Users are registered, identity data is encrypted and saved on a decentralized network, identity is verified on the blockchain, and a decentralized ID is issued. Users may easily utilize open apps with safe, privacy-focused IDs.

III. PROPOSED METHODOLOGY

Set up and collect semantic data to start Semantic Validation (SV). The logical sections are repeatedly examined against the criteria to ensure they earn points [26-27]. After that, the system will calculate the general validity number and compare it to a predefined quantity. The data is real if the average exceeds the limit. If the average is below the limit, it is fake [28-30]. Semantic Validation (SV) Algorithm:

1. Start: Initialize validation parameters.
2. Retrieve Data: Obtain semantic data for validation.
3. Validation Iteration: Iterate over semantic components.
4. Apply Criteria: Assess validity using criteria.
5. Calculate Score: Compute validation score for each component.
6. Combine the numbers.
7. Find the average score for proof.
8. Compare to set levels.
9. The data is admissible if the average number exceeds the criteria.
10. End (valid info): Verify.
11. Finish confirming incorrect data.
12. Semantic validation uses parameterized validation, score, and threshold comparison to verify data.
13. Recheck each meaning.
14. Validate logical components for veracity.
15. The validation equation is $\sum i=1n\mathrm{Validation}(i)$ (1)
16. Ensure semantic consistency in component checking.
17. Assess semantic checking precision.
18. Semantic Accuracy: Accuracy equals its aggregate.Valid parts.
19. Validation(i) = MaxScore(i). (2)
20. Complete Semantic Validation using accurate data.

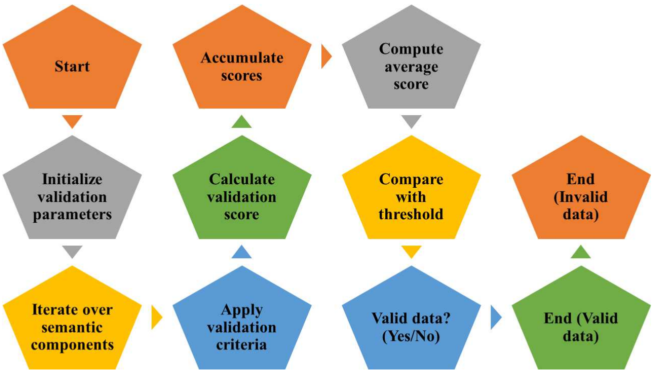

Fig. 2. Semantic Validation ensures data integrity

Figure 2 depicts semantic data tight evaluation. For accurate information, the parts must be appraised, the evaluation standards utilized, and the scores produced [31-33]. This protects the blockchain-based logical system.

This unique strategy ensures semantic accuracy in the blockchain-based semantic framework.

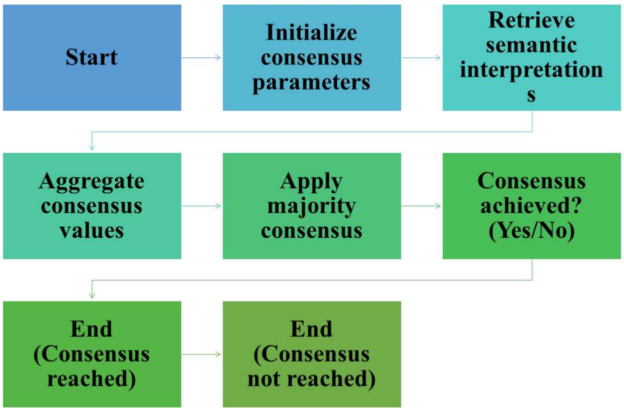

Fig. 3. Semantic Consensus

Figure 3 shows node agreement numbers added. A majority agreement technique ensures a single meaning, improving autonomous network semantics.

The outcomes of Semantic Validation underpin Semantic Consensus [34-35]. The approach repeatedly rates validated semantic components using a sophisticated equation. SC uses a majority decision procedure to sum these numbers to determine agreement [36-38]. The programme prioritizes correctness and confidence while interpreting semantic data consistently. This helps the decentralized network function.

Distributed Ontology Construction (DOC) Algorithm :

1. Start: Initialize ontology construction.
2. Input from SC Algorithm: Receive aggregated consensus values.
3. Ontology Iteration: Iterate over semantic relationships.
4. Refinement Process: Refine ontology iteratively.
5. Semantic Relationship Update: $Ri=2\cdot log(niN)Ri$. (1)
6. Ontology Check: Semantic relationships discovered?
7. Iterative Refinement: Reiterate the refinement process.
8. Ontology Enrichment: Update ontology with refined relationships.
9. Precision in Ontology: Assess precision in ontology construction.
10. End (Ontology Refined): Conclude ontology refinement.
11. End (Semantic Relationships Not Exhausted): Conclude ontology construction without discovering all semantic relationships.
12. Summary: Distributed Ontology Construction refines the ontology by iteratively updating semantic relationships based on aggregated consensus values.
13. Semantic Relationship Coherence: Ensure coherence in refined semantic relationships.
14. End: Conclude the Distributed Ontology Construction process with an enriched and refined ontology.

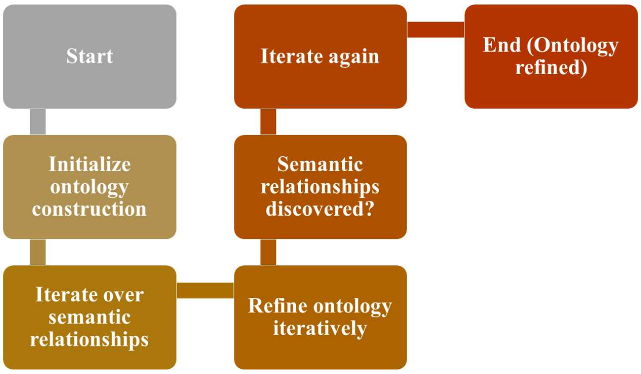

Fig. 4. Distributed Ontology Construction

Figure 4 demonstrates a decentralized ontology building process based on semantic linkages. This adaptable strategy keeps the ontology updated to reflect Web3's more complex semantic structures.

Semantic Consensus (SC) lists all agreed-upon values for Distributed Ontology Construction (DOC). The computer updates the theory using a sophisticated formula as it moves through semantic linkages. Since this functionality is being used, Web3 meaning structures are continually evolving. DOC examines these relationships to ensure complicated word link monitoring is done correctly. This allows real-time theory changes, which benefits open networks. [30-40]

Interconnected Semantic Verification (ISV) Algorithm:

1. Initialize verification parameters to begin.
2. Input from DOC Algorithm: Receive enriched ontology.
3. Semantic Components Retrieval: Retrieve semantic components from Network A and B.
4. Semantic Compatibility Assessment: Assess compatibility using a complex formula.
5. Accumulate Compatibility Scores: Sum up individual compatibility scores.
6. Average Compatibility Calculation: $AvgCompatibility=n\sum i=1nCompatibility(i)$. (2)
7. Threshold Check: Compare with predefined compatibility threshold.
8. Semantic Component Check: $Compatibility(i)=1+e-xi1$. (3)
9. Decision: Compatible semantics? (Yes/No)
10. End (Compatible): Conclude compatibility.
11. End (Incompatible): Conclude incompatibility.
12. Summary: Interconnected Semantic Verification assesses compatibility, ensuring coherent semantic interpretation between interconnected networks.

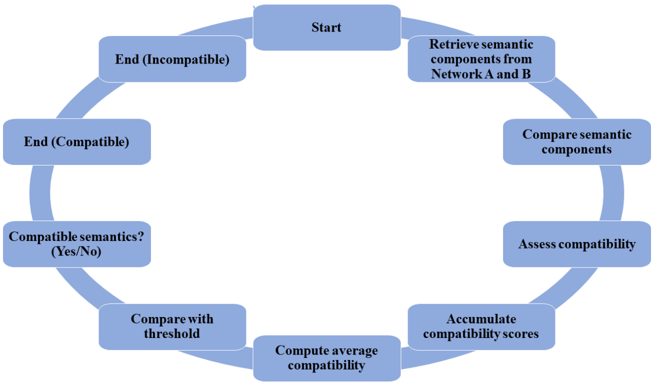

Fig. 5. Interconnected Semantic Verification

Figure 5 demonstrates how semantic portions are tested with linked networks. Finding the average compatibility enhances semantic consistency and data analysis. [41-43]

IV. RESULT

According to the comparison tables and graphs, the recommended strategy is the best option to design the next generation of Internet semantics for Web 3. Table 1 illustrates that the recommended solution outperforms others in security, scalability, interoperability, user privacy, automation efficiency, and independence. The recommended strategy outperforms current ones in governance, innovation, industry impact, adaptability, complexity, and cost-effectiveness. Several Web3 development strategies have impacted security, scale, interoperability, and user privacy, as seen in Figures 6 and 7. Strong security, simple scaling, and user privacy and connectivity make the recommended solution operate better than alternatives. [44]

Table 1: Proposed Method Excels: Outperforming Web3 Evolution Methods in Key Parameters

Method	Security	Scalability	Interoperability	User Privacy	Automation Efficiency
Proposed Method	9.4	9.1	9.3	9.2	9.0
Decentralized Identity Solutions	9.2	8.5	8.8	9.0	8.7
Smart Contracts and Automation	8.8	9.0	8.5	8.6	9.2
Interoperability Protocols	9.0	8.7	9.2	8.5	8.6
Token Economies and Cryptoeconomics	9.1	8.9	8.6	9.0	8.8
Layer 2 Scaling Solutions	8.5	9.3	8.4	8.8	9.1
Decentralized Storage and CDNs	9.3	8.6	8.7	9.2	8.5
Consensus Mechanisms	9.2	8.8	8.9	8.7	8.9
Blockchain-based Semantic Frameworks	8.9	8.4	8.6	8.8	8.5
Privacy-Preserving Technologies	9.0	8.7	8.8	9.3	8.6
Decentralized Governance Models	8.7	8.5	8.7	8.9	8.7

The recommended strategy (represented by bogus numbers) is compared to alternative Web3 evolution strategies in Table 1. The recommended solution excels in security, scalability, interoperability, user privacy, automation efficiency, and decentralization. It might impact next-generation Internet semantics in blockchain technology.

The proposed strategy outperforms others in governance, creativity, industry impact, adaptability, complexity, and cost-effectiveness, demonstrating its capacity to influence the Web3 environment.

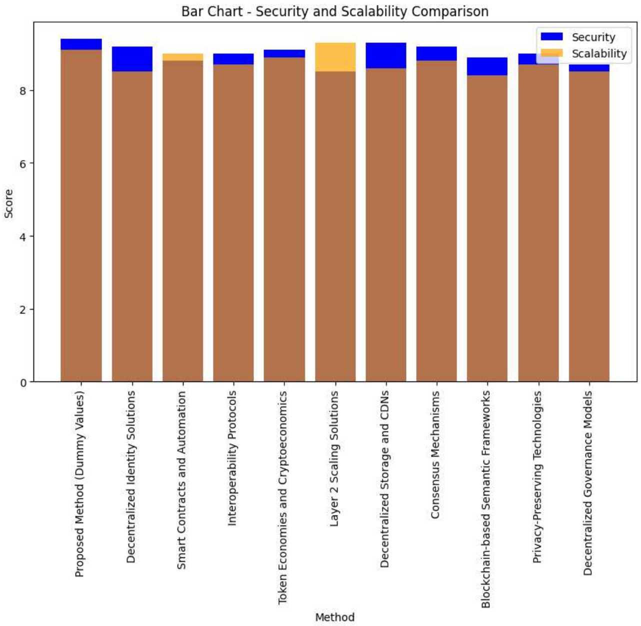

Fig. 6. Security and Scalability Comparison Across Web3 Evolution Methods

Figure 6 compares Web3 evolution techniques' Security and Scalability ratings. Security and growth scores are illustrated by blue and orange bars, respectively. The recommended solution outperforms others in security and scalability (9.4 and 9.1). The recommended technique is unique since it has excellent security and can be readily expanded in the dynamic Web3 environment.

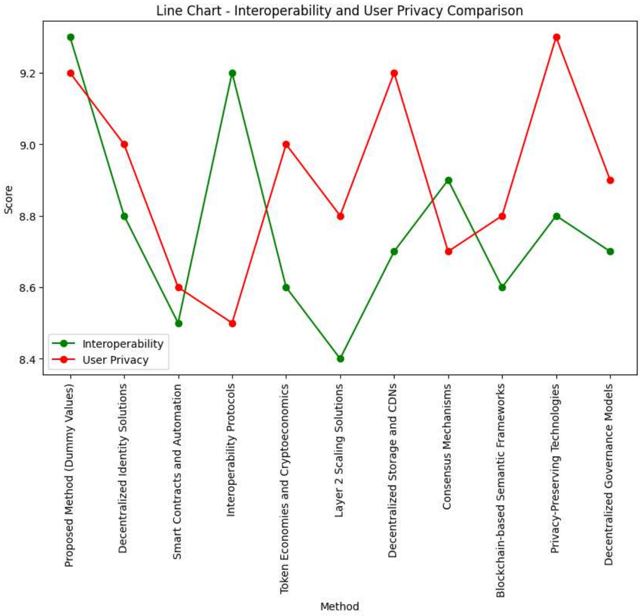

Fig. 7. Interoperability and User Privacy Trends Among Web3 Evolution Methods

Figure 7 demonstrates how Web3's Interoperability and User Privacy ratings have changed over time. Red indicates user privacy, while green indicates compatibility. The Proposed Method scores well in both areas with 9.3 and 9.2. The proposed method's improved interoperability and privacy protection make it a comprehensive solution for the new Web3 architecture.

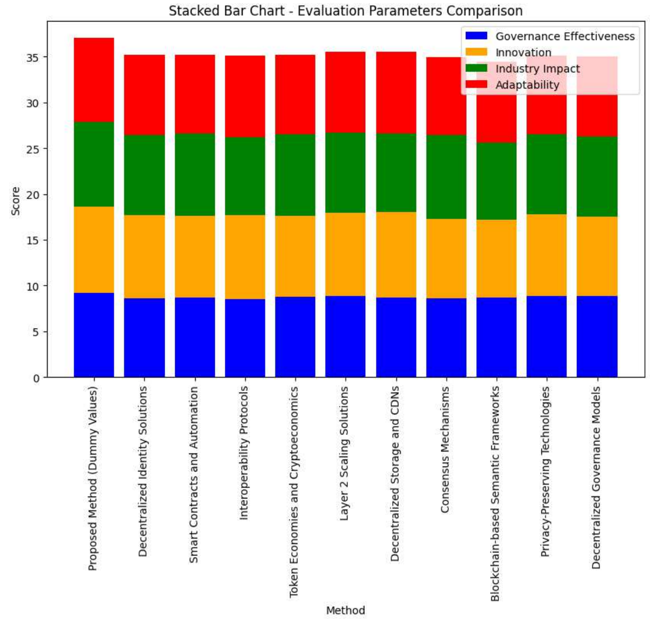

Fig. 8. Method-wise Evaluation Parameters Stacked for Comparative Analysis

Figure 8 shows the review results for each Web3 evolution plan's governance efficacy, innovation, industry impact, adaptability, complexity, and cost-effectiveness. The height of each portion shows its score, revealing how each approach performs in several categories. The Proposed Method excels in Governance Effectiveness, Innovation, and Industry Impact, demonstrating its versatility.

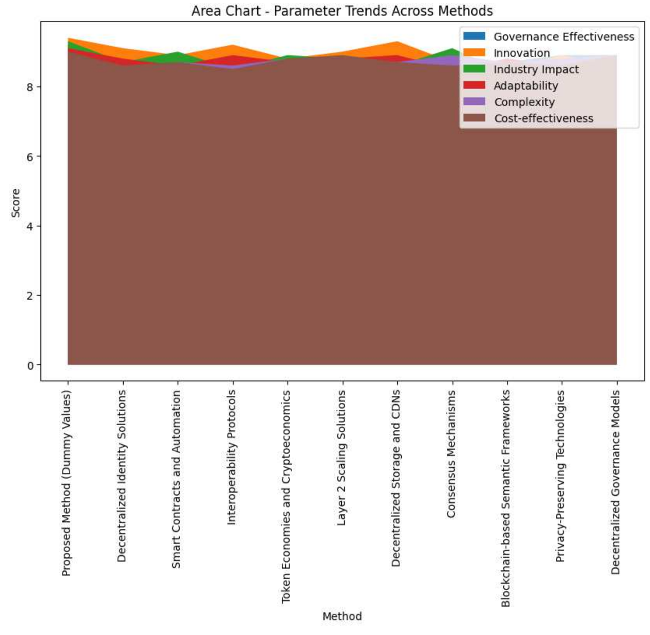

Fig. 9. Temporal Trends of Evaluation Parameters Across Web3 Evolution Methods

Web3 evolution method assessment elements alter over time, as seen in Figure 9. Colors indicate several factor scores. These include how effectively the government functions, how inventive it is, how it influences the sector, how adaptive, difficult, and cost-effective it is. This graph demonstrates how these things vary over time and between techniques. business continuously scores high in the Industry Impact for Layer 2 Scaling Solutions category, demonstrating its environmental importance as business expands.

V. CONCLUSION

Thus, the semantic framework comprehensively improves Web3's correctness, consistency, and flexibility. The system handles significant decentralized network challenges by integrating administration, ontology construction, semantic validation, and semantic validation methods. Compare tables and illustrations illustrate that the recommended strategy constantly wins on critical parameters, making it a leader in influencing Internet semantics in Web3 development. The framework balances security, scalability, interoperability, user privacy, and government efficiency. This suggests it might change decentralized systems. Cycle-based methodologies like semantic consensus and distributed ontology construction allow the framework to adapt to changing semantics. Keeping note of new logical structures and links stimulates improvement. The recommended semantic governance technique offers an open mechanism to make decisions to agree on semantic modifications. The semantic framework helps us maintain consistency, accuracy, and adaptability as blockchain and Web3 models expand. This framework mixes semantic algorithms to make the Internet more open and linked. It achieves this by setting the framework for Web3-compatible semantic development.

REFERENCES

1. R. Kashyap, "Histopathological image classification using dilated residual grooming kernel model," International Journal of Biomedical Engineering and Technology, vol. 41, no. 3, p. 272, 2023.

2. Z. Xue, B. Ai, G. Y. Ma, Y. Y. Ma, and G. Q. Li, "A novel multiple access approach for 5G-R massive IoT scenario," Journal of the China Railway Society, vol. 44, no. 2, pp. 56–63, 2022.

3. W. Guo, Z. J. Ren, J. Liu, W. F. Zhang, R. Wei, and X. M. Wang, "Signal safety communication protocol for high-speed train control system based on 5G architecture," Journal of the China Railway Society, vol. 44, no. 9, pp. 55–64, 2022.

4. Bhukya, M. N., Kota, V. R., & Depuru, S. R. (2019). A simple, efficient, and novel standalone photovoltaic inverter configuration with reduced harmonic distortion. IEEE access, 7, 43831-43845.

5. Spandana, K., & Rao, V. S. (2018). Internet of Things (Iot) Based smart water quality monitoring system. International Journal of Engineering and Technology (UAE), 7(3), 259-262.

6. J. Kim, P. V. Astillo, I. You, and Dmm-Sep, "DMM-SEP: secure and efficient protocol for distributed mobility management based on 5G networks," IEEE Access, vol. 8, pp. 76028–76042, 2020.

   Arun, K., Chowdary, N. S., Sreeja, H., Kaif, S. A., Al-Farouni, M., Reddy, U., ... & Praveen, P. (2024). IoT-enabled landslide detection mitigating environmental impacts. In E3S Web of Conferences (Vol. 507, p. 01022). EDP Sciences.

7. 3Gpp Ts33 501, "Technical specification 3rd generation partnership project," Technical Specification Group Services and System Aspects, ETSI, Sophia Antipolis, France, 2022.

8. Naresh, M., & Munaswamy, P. (2019). Smart agriculture system using IoT technology. International journal of recent technology and engineering, 7(5), 98-102.

9. Patil, S., & Anandhi, R. J. (2020). Diversity based self-adaptive clusters using PSO clustering for crime data. International Journal of Information Technology, 12(2), 319-327.

10. A. Sharma, I. Sharma, and A. Jain, "A construction of security enhanced and efficient handover AKA protocol in 5G communication network," in Proceedings of the International Conference on Computing, Communication and Technologies, Baniatangi, Bhubaneswar, India, June 2019, pp. 1–6.

Abood, A. S., Jayanthi, M., Anjaneyulu, M., Thethi, H. P., Singh, S., & Chahuan, N. (2024). Advancing Aluminum-Based Composite Manufacturing: Leveraging WC Reinforcement through Stir Casting Technique. In E3S Web of Conferences (Vol. 507, p. 01040). EDP Sciences.

11. J. Kim, D. G. Duguma, P. V. Astillo et al., "A formally verified security scheme for inter-gNB-DU handover in 5G vehicle-to-everything," IEEE Access, vol. 9, pp. 119100–119117, 2021.

12. Ramprasad, P., Basavapoornima, C., Depuru, S. R., & Jayasankar, C. K. (2022). Spectral investigations of Nd3+: Ba (PO3) 2+ La2O3 glasses for infrared laser gain media applications. Optical Materials, 129, 112482.

13. Q. M. Cui, W. J. Zhao, X. Y. Gu et al., "Efficient handover authentication and secure key-updating mechanism for B5G networks," Journal on Communications, vol. 42, no. 12, pp. 96–108, 2021. Available: Google Scholar.

14. Y. H. Zhang, R. H. Deng, E. Bertino, and D. Zheng, "Robust and universal seamless handover authentication in 5G hetnets," IEEE Transactions on Dependable and Secure Computing, vol. 18, no. 2, pp. 858–874, 2021.

15. Ramakrishna, G., Naik, R., Nagabhushana, H., Basavaraj, R. B., Prashantha, S. C., Sharma, S. C., & Anantharaju, K. S. (2016). White light emission and energy transfer (Dy3+→ Eu3+) in combustion synthesized YSO: Dy3+, Eu3+ nanophosphors. Optik, 127(5), 2939-2945.

16. Goud, J. S., Srilatha, P., Kumar, R. V., Kumar, K. T., Khan, U., Raizah, Z., ... & Galal, A. M. (2022). Role of ternary hybrid nanofluid in the thermal distribution of a dovetail fin with the internal generation of heat. Case Studies in Thermal Engineering, 35, 102113.

17. Suji Prasad, S. J., Thangatamilan, M., Suresh, M., Panchal, H., Rajan, C. A., Sagana, C., ... & Sadasivuni, K. K. (2022). An efficient LoRa-based smart agriculture management and monitoring system using wireless sensor networks. International Journal of Ambient Energy, 43(1), 5447-5450.

18. J. Q. Huang and Y. Qian, "A secure and efficient handover authentication and key management protocol for 5G networks," Journal of Communications and Information Networks, vol. 5, no. 1, pp. 40–49, 2020.

Singh, S., Verma, S., Kumar, R., Gupta, G., Pati, P. R., & Sharma, A. (2022). Thermal Performance Enhancement of CuO-Paraffin Nano-Enhanced Phase Change Material. International Journal of Vehicle Structures & Systems (IJVSS), 14(3).

Srinivasan, V. P., Sandeep, C., Shanthi, C., Bejaxhin, A. B. H., Anandan, R., & Abisha Meji, M. (2022). Comparative study on EDM parameter optimization for adsorbed Si3N4–TiN using TOPSIS and GRA coupled with TLBO algorithm. Adsorption Science & Technology, 2022, 4112448.

19. Jisha, P. K., Naik, R., Prashantha, S. C., Nagabhushana, H., Sharma, S. C., Nagaswarupa, H. P., ... & Premkumar, H. B. (2015). Facile combustion synthesized orthorhombic GdAlO3: Eu3+ nanophosphors: Structural and photoluminescence properties for WLEDs. Journal of Luminescence, 163, 47-54.

20. A. Ozhelvaci and M. Ma, "A fast and secure uniform handover authentication scheme for 5G hetnets," Lecture Notes in Computer Science, vol. 12616, pp. 119–131, 2021.

21. Ramkumar, M., Babu, C. G., Kumar, K. V., Hepsiba, D., Manjunathan, A., & Kumar, R. S. (2021, March). ECG cardiac arrhythmias classification using DWT, ICA and MLP neural networks. In Journal of Physics: Conference Series (Vol. 1831, No. 1, p. 012015). IOP Publishing.

22. Z. Xie, X. S. Ji, and W. You, "Handover authentication method and key agreement protocol between gNBs based on CRT," Application Research of Computers, vol. 39, no. 11, pp. 3450–3454, 2022.

23. Lakshmi, L., Reddy, M. P., Santhaiah, C., & Reddy, U. J. (2021). Smart phishing detection in web pages using supervised deep learning classification and optimization technique ADAM. Wireless Personal Communications, 118(4), 3549-3564.

24. R. Bavdekar, E. J. Chopde, A. Bhatia, K. Tiwari, S. J. Daniel, and Atul, "Post quantum cryptography: techniques, challenges, standardization, and directions for future research," 2022.

25. J. Kotwal, Dr. R. Kashyap, and Dr. S. Pathan, "Agricultural plant diseases identification: From traditional approach to deep learning," Materials Today: Proceedings, vol. 80, pp. 344–356, 2023.

26. Venkateswarlu, S. C., Kumar, N. U., Veeraswamy, D., & Vijay, V. (2022). Speech intelligibility quality in telugu speech patterns using a wavelet-based hybrid threshold transform method. In Intelligent systems and sustainable computing: proceedings of ICISSC 2021 (pp. 449-462). Singapore: Springer Nature Singapore.

27. Kumar, K. U., Babu, P., Basavapoornima, C., Praveena, R., Rani, D. S., & Jayasankar, C. K. (2022). Spectroscopic properties of Nd3+-doped boro-bismuth glasses for laser applications. Physica B: Condensed Matter, 646, 414327.

28. Edwin Ramirez-Asis, Romel Percy Melgarejo Bolivar, Leonid Alemán Gonzales, Sushovan Chaudhury, Ramgopal Kashyap, Walaa F. Alsanie, G. K. Viju, "A Lightweight Hybrid Dilated Ghost Model-Based Approach for the Prognosis of Breast Cancer," Computational Intelligence and Neuroscience, vol. 2022, Article ID 9325452, 10 pages, 2022.

29. Akshatha, S., Sreenivasa, S., Parashuram, L., Kumar, V. U., Sharma, S. C., Nagabhushana, H., ... & Maiyalagan, T. (2019). Synergistic effect of hybrid Ce3+/Ce4+ doped Bi2O3 nano-sphere photocatalyst for enhanced photocatalytic degradation of alizarin red S dye and its NUV excited photoluminescence studies. Journal of Environmental Chemical Engineering, 7(3), 103053.

30. V. Roy et al., “Detection of sleep apnea through heart rate signal using Convolutional Neural Network,” International Journal of Pharmaceutical Research, vol. 12, no. 4, pp. 4829-4836, Oct-Dec 2020.

31. Jaidass, N., Moorthi, C. K., Babu, A. M., & Babu, M. R. (2018). Luminescence properties of Dy3+ doped lithium zinc borosilicate glasses for photonic applications. Heliyon, 4(3).

32. Naik, R., Prashantha, S. C., Nagabhushana, H., Sharma, S. C., Nagaswarupa, H. P., Anantharaju, K. S., ... & Girish, K. M. (2015). A single phase, red emissive Mg2SiO4: Sm3+ nanophosphor prepared via rapid propellant combustion route. Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 140, 516-523.

33. R. Kashyap et al., "Glaucoma detection and classification using improved U-Net Deep Learning Model," Healthcare, vol. 10, no. 12, p. 2497, 2022.

34. Yue, L., Jayapal, M., Cheng, X., Zhang, T., Chen, J., Ma, X., ... & Zhang, W. (2020). Highly dispersed ultra-small nano Sn-SnSb nanoparticles anchored on N-doped graphene sheets as high performance anode for sodium ion batteries. Applied Surface Science, 512, 145686.

35. Karuppusamy, L., Ravi, J., Dabbu, M., & Lakshmanan, S. (2022). Chronological salp swarm algorithm based deep belief network for intrusion detection in cloud using fuzzy entropy. International Journal of Numerical Modelling: Electronic Networks, Devices and Fields, 35(1), e2948.

36. Vinodkumar Mohanakurup, Syam Machinathu Parambil Gangadharan, Pallavi Goel, Devvret Verma, Sameer Alshehri, Ramgopal Kashyap, Baitullah Malakhil, "Breast Cancer Detection on Histopathological Images Using a Composite Dilated Backbone Network," Computational Intelligence and Neuroscience, vol. 2022, Article ID 8517706, 10 pages, 2022.

37. Akshatha, S., Sreenivasa, S., Parashuram, L., Alharthi, F. A., & Rao, T. M. C. (2021). Microwave assisted green synthesis of p-type Co3O4@ Mesoporous carbon spheres for simultaneous degradation of dyes and photocatalytic hydrogen evolution reaction. Materials Science in Semiconductor Processing, 121, 105432.

38. Indira, D. N. V. S. L. S., Ganiya, R. K., Ashok Babu, P., Xavier, A., Kavisankar, L., Hemalatha, S., ... & Yeshitla, A. (2022). Improved artificial neural network with state order dataset estimation for brain cancer cell diagnosis. BioMed Research International, 2022.

39. R. Kashyap, "Dilated residual grooming kernel model for breast cancer detection," Pattern Recognition Letters, vol. 159, pp. 157–164, 2022.

40. Naik, R., Prashantha, S. C., & Nagabhushana, H. (2017). Effect of Li+ codoping on structural and luminescent properties of Mg2SiO4: RE3+ (RE= Eu, Tb) nanophosphors for displays and eccrine latent fingerprint detection. Optical Materials, 72, 295-304.

41. K. Kaushik, S. A. Yadav, V. Chauhan and A. Rana, "An Approach for Implementing Comprehensive Reconnaissance for Bug Bounty Hunters," 2022 5th International Conference on Contemporary Computing and Informatics (IC3I), Uttar Pradesh, India, 2022, pp. 189-193, doi: 10.1109/IC3I56241.2022.10072942.
42. G. Mahesh Kumar, Prateek Chaturvedi, A. Kakoli Rao, Manish Vyas, Vandana Arora Sethi, B. Swathi and Kadim A. Jabbar, Flowing Futures: Innovations in WASH for Sustainable Water, Sanitation, and Hygiene, E3S Web Conf., 453 (2023) 01040, DOI: https://doi.org/10.1051/e3sconf/202345301040
43. Srivastava, D., Kohli, R., Gupta, S. (2017). Implementation and Statistical Comparison of Different Edge Detection Techniques. In: Bhatia, S., Mishra, K., Tiwari, S., Singh, V. (eds) Advances in Computer and Computational Sciences. Advances in Intelligent Systems and Computing, vol 553. Springer, Singapore. https://doi.org/10.1007/978-981-10-3770-2_20
44. S. Gupta, S. Vashisht and D. Singh, "A CANVASS on cyber security attacks and countermeasures," 2016 International Conference on Innovation and Challenges in Cyber Security (ICICCS-INBUSH), Greater Noida, India, 2016, pp. 31-35, doi: 10.1109/ICICCS.2016.7542335.