

# The Utilization of Quantum Computing for AI Applications in Classical IT Network Environments

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**Abstract:** Quantum computing is a new technological discovery that has the potential to transform industries based on high computational capabilities. This work explores how quantum computing will be integrated into AI applications and what impacts it will have on IT networks. A review of the recent literature shows that IT networks need to be upgraded to receive quantum-enhanced AI algorithms, as they require more computation power and faster real-time processing. It covers three major topics: the enabling of quantum AI applications, the role of QRC (quantum reservoir computing) in IT networking, and the challenges concerning the protocols of quantum communication, such as QKD (quantum key distribution). Network architectures of today's state of the art will have to evolve toward enabling quantum-enabled AI, primarily regarding processing speed and interaction between the quantum and classical systems. This work, therefore, wishes to explain how such technological advances could influence AI applications and tune IT networks. We discuss the following questions: How can IT networks support the exploitation of quantum computing for AI applications? What effects do the dynamics and symmetries of quantum reservoir computing have on IT networks? Which IT networks can adapt to the challenges introduced by quantum computing technologies? The scope and depth of contributions reviewed in the articles together suggest huge potential for quantum computing in optimizing machine learning processes and IT networks with improved data handling and network management. At the same time, these ambitions are underlined by scaling concerns related to quantum hardware and qubit stabilization, and finally, the relative easiness with which quantum-classical computing is retrofitted into existing IT infrastructures. The findings suggest that hybrid quantum-classical systems will be essential in future IT infrastructure; efficiency and scalability will have to balance with security concerns in quantum computing environments.

**Keywords:** Quantum computing, AI applications, IT networks, Quantum reservoir computing (QRC), Quantum key distribution (QKD)

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## 1. Introduction

Quantum computing is an emerging technology that holds the potential to impact industries through its powerful computational capabilities, particularly in AI applications and IT network optimization. This work will critically review several recent research publications in quantum computing with a closer look at their potential impacts, particularly in AI and IT networks. The selected studies have been chosen carefully to reflect a broad portfolio of the uses of quantum computing that consists of advances in machine learning, enhancement in IT infrastructure performance, and optimization of already existing IT frameworks.

The successful diffusion of quantum computing technologies will strictly depend on robust IT networks. Various studies point out, that the advent of quantum computing will redesign and optimize IT infrastructures. Quantum machine learning algorithms will produce data that needs to be managed and transported over high-performance networks within sensible timelines. In addition, with the integration of quantum computing into AI applications, IT networks will need to evolve to support quantum-enhanced algorithms that demand higher computational power and faster real-time processing speeds. Present state-of-the-art network architectures have to be redefined with the demands of quantum AI, especially in terms of processing efficiency and seamless interaction between quantum and classical systems. This work focuses on how these technological advancements will impinge upon AI applications and drive the necessary adaptations in IT networks. Consequent to these thoughts, the following three research questions were identified:

*RQ1: How can IT networks support the exploitation of quantum computing for AI applications?:*

*RQ2: What effects do the dynamics and symmetries of quantum reservoir computing have on IT networks?*

*RQ3: Which IT networks can adapt to the challenges introduced by quantum computing technologies?*

The structure of the paper is as follows: The methodology and the research questions relevant to the area of the paper are illustrated in Section 3. Section 4 presents the findings. The analysis is further discussed in detail in Section 5. A conclusion is drawn in Section 6, and Section 7 discusses future considerations about the topic.

## **2. Literature Review**

Quantum computing uses superposition and entanglement to perform complex computations that transcend classical computing. Despite the potential for AI, cryptography, and optimization, practical applications are impeded by hardware limitations, excessive error rates, and integration problems Huang et al. (2022).

Quantum Reservoir Computing (QRC) presents a practical alternative to conventional quantum models through the efficient processing of temporal information without the need for complex gate operations Lohof et al. (2023). QRC has various potential applications in speech recognition, financial modeling, and time-series analysis, thereby rendering it suitable for Noisy Intermediate-Scale Quantum (NISQ) devices; however, scalability is a significant issue.

The integration of quantum computing in information technology networks demands the development of hybrid quantum-classical architectures. Quantum Key Distribution (QKD) significantly improves secure communication, especially in optical and photonic networks Moreolo et al. (2023). As both quantum and classical channels need to coexist, network infrastructure and protocols must be modified accordingly.

Current constraints in qubit stability, error correction, and scalability render hybrid models—the type where quantum processors execute specific tasks and classical IT infrastructure takes care of execution—the most viable near-term approach Sridhar et al. (2023). Integration of hardware and network issues will have to be resolved for the actual deployment of quantum-AI systems.

## **3. Methodology**

This research uses a systematic literature review to explore how quantum computing can improve artificial intelligence applications and impact information technology networks, following established review protocols in quantum computing research. The stages of systematic review described by Arksey and O'Malley (2005) and Levac et al. (2010) were used in this study. Before exploring AI applications, this study first establishes the current state of quantum computing implementations, recognizing the slow progress over the past two decades and the gap between theoretical potential and practical validation. In this regard, three key research questions are identified on which to base a structured overview, while selecting the relevant literature that is useful in providing insight into each category. The analysis will present how each selected article adds to the understanding of the full range of possibilities that quantum computing offers in AI and IT network environments.

A structured search strategy using the databases of IEEE Xplore, Google Scholar, and Science Direct was carried out using cybersecurity-focused terms such as "*Quantum cybersecurity threats*," "*Quantum secure systems*," "*Quantum encryption for critical infrastructure*," and "*Risk assessment in quantum secure infrastructures*." To broaden the scope, additional terms like "*Quantum computing in AI applications*," "*Quantum-classical IT network integration*," and "*Quantum reservoir computing for IT systems*". Thereafter, identification, screening, and selection of the relevant literature are visually indicated on a PRISMA flow diagram (see Figure 1). The initial identification identified 435 articles, of which 5 were duplicates, thus leaving 430 articles to be screened. The identified records were then screened for relevance related to quantum computing, and 338 articles were discarded as irrelevant. 92 reports were sought for detailed retrieval after the screening, which was assessed for eligibility. At this stage, 49 reports were excluded since they did not focus on applications of AI. 24 reports were found irrelevant since they did not address IT network environments. Finally, a total of 19 studies met the inclusion criteria and were thus selected for review.

To ensure a balance between speculation and tested implementations, the literature selection prioritized studies demonstrating real-world quantum computing applications. Figure 1 presents the PRISMA flow diagram, summarizing how the results of the initial search were systematically refined to focus on high-quality studies contributing to the research questions. Critical analysis of each of the selected articles explores how quantum computing will potentially transform AI workloads and the underlying IT infrastructure.

### **3.1 Research Question 1**

*How can IT networks support the exploitation of quantum computing for AI applications?*

The first research question addresses the role that IT networks will play in supporting the implementation of quantum computing for AI applications. Such reviews have indicated how quantum computing enables faster processing in AI Applications, allowing for novel approaches in areas related to unsupervised and supervised learning. Unlike classical computing, quantum computing requires specialized network architectures due to the

constraints of qubit coherence, the need for quantum-classical hybrid processing, and quantum communication protocols such as Quantum Key Distribution (QKD). Since current quantum computers rely on cloud-based access and remote interfacing with classical IT infrastructure Sridhar et al. (2023), high-speed, low-latency IT networks are essential for efficient data exchange between quantum and classical systems.

While current quantum computing struggles with large AI data sets due to the qubit limitations, ongoing research focuses on enhancing scalability. With emerging quantum hardware, IT networks will be crucial to supply high-speed, low-latency connectivity to hybrid quantum-classical systems. In this way, IT networks will have to support such hybrid systems by providing them with high-speed, low-latency communication channels. Further developments in this field might include the development of new network protocols, capable of dealing with the specific requirements that quantum computing places on the process of integration into already established infrastructures.

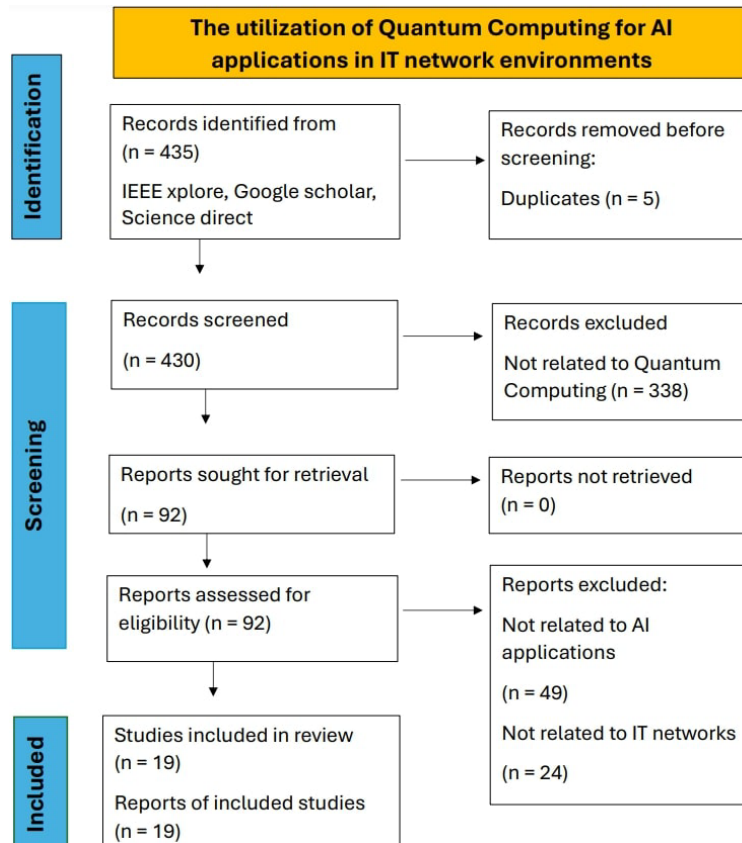


Figure 1: Prisma flow diagram

### 3.2 Research Question 2

*What effects do the dynamics and symmetries of quantum reservoir computing have on IT networks?*

The second research question is related to quantum reservoir computing and its probable impacts on IT networks. By leveraging quantum entanglement and high-dimensional phase space, QRC processes temporal information efficiently, rendering it a promising method for real-time data processing in hybrid quantum-classical systems. Unlike gate-based quantum computing, QRC is operable on noisy intermediate-scale quantum (NISQ) hardware with minimal error correction, hence more suitable for near-term integration into IT Lohof et al. (2023). Such dynamics bring about challenges but also new opportunities for IT networks, particularly in the management of data flow between quantum and classical systems. QRC's partial resilience to noise enhances memory capacity, optimally maximizing real-time data processing and communication. To facilitate QRC-based systems, IT networks may require redesigning to incorporate more adaptable and resilient architectures to provide stability, low latency, and coherence in quantum-classical interactions.

### 3.3 Research Question 3

*Which IT networks can adapt to the challenges introduced by quantum computing technologies?*

The third research question concerns the investigation of any already existing IT networks that could be potentially adapted for the technological challenge imposed by quantum computing. The IT infrastructures used today must be highly upgraded to cope with quantum communication protocols like QKD and data processing enhanced with quantum. The IT networks considered for adaptation include optical networks, hybrid quantum-classical networks, and SDN frameworks, which will require enhancements to support quantum communication and processing. While most modern IT networks run on standardized protocols like TCP/IP, architectures will need to be upgraded to support quantum communication, quantum repeaters, and error-correcting codes thereby enabling the integration of quantum computing. Further in the text, the literature review described how optical networks were developed, as well as the software frameworks for simulating quantum networks, like QuNetSim, and the integration of quantum technologies with classical network systems. Additionally, these existing IT networks will need to adopt a more hybrid approach in areas where quantum and classical technologies work in tandem. For instance, enabling technologies of quantum repeaters and error-correcting codes are key to enabling IT networks to handle quantum communication and computations. Such technology-employing networks shall thus be at a decisive advantage in scaling up for the demands imposed by quantum-enhanced AI and secure communication frameworks.

Table 1 summarizes some of the key contributions from the literature, categorizing various research areas where quantum computing intersects with AI and IT networks. We identified specific areas of research under each category, such as Quantum Computing for AI Applications, Quantum Reservoir Computing, Quantum Communication and Networks, amongst others. References are listed under each category: foundational studies and recent advances that demonstrate what quantum computing technologies can bring to AI functionality, improve security measures in IT infrastructures, and foster novel forms of communication.

**Table 1: Different research categories reviewed in this article and corresponding references**

Categories	References
Quantum Computing for AI Applications	Abdelgaber et al. (2020) Jain et al. (2022) Huang et al. (2022) Li (2024)
Quantum Reservoir Computing	Lohof et al. (2023) Huang et al. (2022) Li (2024)
Quantum Communication and Networks	Sridhar et al. (2023) Moreolo et al. (2023) Nishimura (2013) Li et al. (2022) Safari and Ghavifekr (2022) Zhang et al. (2022)
Quantum Key Distribution and Cryptography	Das and Kule (2022) Pande (2023) Guangxian et al. (2022) Zhang et al. (2022)
IT Networks for Quantum Computing Integration	Diadamo et al. (2021) Sridhar et al. (2023) Moreolo et al. (2023) Li et al. (2022)
Quantum Neural Networks	Huang et al. (2022) Konar et al. (2023) Skjellum et al. (2024) Li (2024)
Optical Networks and Quantum Photonic Systems	Moreolo et al. (2023) Sadkhan and Abbas (2021) Zhang et al. (2022)
Post-Quantum Cryptography	Pande (2023) Zhang et al. (2022)

Categories	References
Quantum Machine Learning	Abdelgaber and Nikolopoulos (2020)
Optimization	Jain et al. (2022)
	Li (2024)
	Skjellum et al. (2024)

#### 4. Analysis

All reviewed articles combined have a bearing on answering the critical research questions by clearly showing how IT networks will change to accommodate quantum computing in AI applications. Works like Abdelgaber et al. (2020) and Jain et al. (2022) answer Research Question 1 in the affirmative, as they present proof that quantum-enhanced algorithms, such as quantum support vector machines (QSVM) and quantum k-means clustering (QK-Means), leverage quantum speedup for classification and clustering tasks, providing computational advantages in AI applications Abdelgaber et al. (2020) and Jain et al. (2022). These are basic steps in improving large-scale AI workloads by putting efficiency in handling and transferring large sets of data across the IT network in real time. Complexity in quantum algorithms—with their capability of processing a lot of data in parallel—further shows that network infrastructures are going up in bandwidth, down in latency, and higher in data storage. Moreover, the solutions provided by quantum machine learning methods, such as QPCA, are superior to those provided by classical algorithms, but they require IT systems that can sustain the extra computational load.

For Research Question 2, the spotlight falls on quantum reservoir computing and, specifically, its processing of temporal data using quantum dynamics. In Lohof et al. (2023), it was outlined that QRC depends on quantum entanglement and high-dimensional phase space to outperform its classical counterpart in some tasks, depending on the real-time processing of complex temporal information. Thus, a rationale is provided in the articles for IT networks to be developed to address novel challenges imposed by QRC: such as higher speed of processing, more dynamic data pathways, and real-time quantum state management. It means designing network systems to dynamically adapt to quantum inputs, optimize with temporal data streams, and support an integrated computing environment where quantum-classical interactions will be carried out.

Hence, in addressing Research Question 3, the literature reviewed emphasizes how meaningful adaptation to emerging security and data transmission complexities brought along by quantum computing technologies to IT networks is. Research like Sridhar et al. (2023) and Huang et al. (2022). have marked the necessity of the inclusion of quantum communication protocols, such as QKD, in IT infrastructures for secure data transmission in hybrid quantum-classical networks. These technologies introduce new unprecedented security features such as detection of eavesdropping and protection against quantum-based attacks, hence becoming essential as IT networks face completely new threats introduced by the advancement of quantum computing.

The merge of photonic and quantum communications into optical networks is introduced in Das and Kule. It points to the growing need for scalable and flexible quantum communications in future IT networks due to high volumes of data, which should have better security and more efficiency. Publications like Nishimura (2013) and Nishimura (2013) Sadkhan and Abbas (2021) further extend the argument to show that IT networks will have to incorporate quantum network coding and error correction techniques in their network resource utilization for smooth communication across increasingly complicated quantum infrastructures, thus enabling traditional networks to meet the extended requirements brought in by quantum computing. In other words, what can be gathered from the reviewed articles is the fact that IT systems will have to redefine themselves by making changes in computational powers, enhancing processing capabilities, tightening their security mechanisms, and enabling the management of real-time data. These are the potential areas where without much disturbance the advent of quantum could be continued for complete AI-based applications. The problems of scaling, adapting to quantum communication protocols, and optimizing quantum-classical hybrid systems will be the main issues shaping classical IT networks soon.

#### 5. Discussion

The contribution of this effort is to provide an in-depth understanding of how IT networks need to change to adequately support quantum computing, particularly in the case of artificial intelligence applications. The research, as outlined in the literature (Abdelgaber and Nikolopoulos, 2020; Jain et al., 2022), indicates that quantum-enhanced artificial intelligence algorithms would profoundly impact IT networks. Quantum algorithms such as QSVM and quantum clustering offer enhanced computing capabilities and processing velocity for artificial intelligence. Quantum computing can accelerate execution times; however, IT network

improvements should focus on optimizing quantum-classical data exchange instead of merely expanding storage or managing network latency. The integration of Quantum AI will necessitate advancements in parallel computing to guarantee seamless interaction with current IT infrastructures.

Research Question 3 calls for IT networks to devise hybrid quantum-classical systems to manage the challenges brought forth by quantum communication. Works like Sridhar et al. (2023), Huang et al. (2022) and Moreolo et al. (2023) discuss how quantum communication protocols, primarily Quantum Key Distribution, will have to provide security for IT infrastructures. QKD relies on the principles of quantum mechanics to provide theoretically unbreakable encryption; however, its integration into current IT networks necessitates much reflection. Another important issue is the scaling of quantum networks: hybrid quantum-classical systems will need to manage effectively the coexistence of the classical and quantum data streams. As already mentioned in various works, such as Huang et al. (2022), IT networks will have to introduce high-level routing and resource allocation strategies enabling them to cope with quantum information along with traditional data so that security and performance are preserved throughout the system. According to their vision, in the future, IT networks will have a resilient, efficient, and secure balance between quantum and classical technologies. This balance will be important later because industrial quantum communication will be involved in the transmission of sensitive data, such as those in highly critical areas like finance, health, and national security.

Together, these articles emphasize how both computation and security are gaining more significance as time goes by in the quantum era. In particular, the introduction of quantum computing into AI and IT networks will bring about not only increased speed and data processing but also challenges of a more dynamic adaptive nature and secure communications. This means that as quantum computing stretches the capacities of currently existing IT systems, infrastructure should be continuously updated toward this goal but in such a way that robust security frameworks must be maintained. Yet the same study also underlines the limitations in our present-day understanding of how these systems will interact on a large scale. Questions are still open about the cost-effectiveness of quantum infrastructure upgrades and quantum network scalability. In these respects, future research is to be directed toward practical implementation and real-world applications of quantum communication and computation within IT networks, solving hardware limitations and ensuring the security of hybrid systems. Another aspect that demands further research is the role of software development in the management of complexity within quantum systems. The intersection of quantum computing and AI has opened new avenues for innovation; if thoughtful planning and continued research do not go hand in hand, much of the full potential will be missed.

## **6. Conclusions**

This work discusses the introduction of quantum computing into AI applications and the ensuing consequences on IT networks. Some points were discussed that concerned main areas where IT infrastructure will have to undergo major changes: supporting quantum-enhanced AI algorithms with growing computational power, real-time data processing, and handling more complex workflows. The literature review confirmed that soon hybrid quantum-classical systems are going to be the cornerstone of IT networks, offering a practically viable solution for scalability, efficiency, and security, combining powers from these two computing models. Quantum computing, as it develops, will need fully flexible IT architectures to support both paradigms reliably with minimal computational bottlenecks for a variety of workloads.

Therefore, from the findings, the implication is that quantum algorithms, such as quantum support vector machines and quantum reservoir computing, would provide great potential for transforming AI workloads at unprecedented scales, increasing machine learning models and data processing applications at a completely new frontier for AI applications. Of course, these opportunities also come hand-in-glove with challenges, such as latency, data throughput, and coherence of quantum states in transmission, which are intrinsic at the network level. In every case, quantum communication will become integral to these systems, but higher order networking protocols, including Quantum Key Distribution, are central to securing data exchange and safeguarding network integrity.

The future of IT networking in the quantum computing landscape will be a mix of innovative strategies, infrastructure upgrades, and new requirements for security, scalability, and operational efficiency. Quantum technologies will shortly disrupt conventional IT infrastructures, shifting the paradigm to new hardware equipment such as quantum processors, entanglement-based communication devices, and software systems capable of managing the peculiar complexities introduced by quantum data. While quantum computing is developing, the networks will also have to provide much more specialized means of handling data, which can easily handle quantum and classical information for the best performance.

There are many practical obstacles despite enormous progress in quantum computing and its embedding into AI: overcoming some specific obstacles on the road to full-scale scalability in quantum networks, ways of realizing fault tolerance in quantum systems, and guaranteeing strong interoperability across quantum-classical hybrids. Second, the realization of quantum technologies in various practical applications involves collaboration between quantum scientists, AI experts, and IT network engineers. As the quantum era kicks in, it changes how business is conducted in many industries, shifting from fully classical infrastructures into quantum-enhanced ones, which would require an IT ecosystem that is future-proof enough to uncover the full value of quantum computing.

## **7. Future Discussions**

While the future of integrating quantum computing with AI applications and IT networks provides huge scope for great opportunities, at the same time, many challenges remain to be researched. Though theoretical models are showcasing the potential of quantum-enhanced algorithms like quantum support vector machines and quantum k-means clustering, the practical implementation is a real issue. Research should be directed towards scalability in quantum networks and coherence in the qubits while transmitting information. Quantum applications will push today's IT infrastructure to the breaking point, demanding upgrades for network handling of enormous computational power and speed from these systems.

Another important line of investigation in the future concerns hybrid quantum-classical networks. As AI applications increasingly make use of quantum algorithms, IT systems must offer support for seamless interaction between classical and quantum computing environments. This then calls for the development of adaptive network architectures that will be able to dynamically handle both the quantum and classical data streams. Besides, the cost of such upgrades must be weighed out, since scaling quantum networks could be very resource intensive. A necessary component of research into reducing costs with a view to maximum network efficiency will be in making such advances commercially viable.

Amongst the hot topics that will continue to rule the future of IT networks in the quantum era, security will remain right at the top. While quantum communication protocols, such as QKD, do theoretically offer unbreakable encryption, their integration into broader existing security frameworks will determine how far their widespread adoption will go. Quantum-based threats imply that classical cryptography will have to rise to new challenges. This in the future calls for more research on robust post-quantum cryptography and preparation of IT networks to deal with quantum-enhanced attacks.

Besides infrastructure, much of the task of handling quantum systems' complexities will lie in software. There will be a need to create user-friendly and scalable software frameworks that can interface with both quantum and classical systems. The simulation of quantum network operations, such as QuNetSim, is an important tool that will play an essential role in testing and optimizing quantum networks before their eventual deployment. Further work should be done on perfecting these frameworks to accommodate real-time quantum operations without necessarily affecting the fidelity of quantum states.

There still lies a gap in explaining how the usage of quantum computing could find practical applications in industries other than research labs. The fields that have much to gain from quantum AI include finance, healthcare, and national security. However, these need to be reviewed in terms of real-life case studies and pilot-level implementations to assess the pragmatic difficulties in scaling quantum computing. Future research will have to position itself in such applied contexts by investigating how quantum algorithms can be used to solve industry-specific problems and what adjustments will be made to IT networks to support such solutions.

Overall, quantum computing in intersection with AI has a lot of room for advancement regarding scalability, security cost, and implementation. Complete functionality to be recognized with these technologies in concern with AI applications requires the existence of resilient, efficient, and scalable hybrid quantum-classical systems.

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## References

- Abdelgaber, N. and Nikolopoulos, C. (2020) "Overview on Quantum Computing and its Applications in Artificial Intelligence," 2020 IEEE Third International Conference on Artificial Intelligence and Knowledge Engineering (AIKE), Laguna Hills, CA, USA, pp. 198-199, doi: 10.1109/AIKE48582.2020.00038.
- as, G. and Kule, M. (2022) "A New Error Correction Technique in Quantum Cryptography using Artificial Neural Networks," 2022 IEEE 19th India Council International Conference (INDICON), Kochi, India, pp. 1-5, doi: 10.1109/INDICON56171.2022.10040091.
- Diadamo, S., Nötzel, J., Zanger, B. and Bese, M. M. (2021) "QuNetSim: A Software Framework for Quantum Networks," IEEE Transactions on Quantum Engineering, vol. 2, pp. 1-12, Art no. 2502512, doi: 10.1109/TQE.2021.3092395.
- d'Avossa, L., Caleffi, M., Wang, C., Illiano, J., Zorzetti, S. and Cacciapuoti, A. S. (2023) "Towards the Quantum Internet: Entanglement Rate Analysis of High-Efficiency Electro-Optic Transducer," 2023 IEEE International Conference on Quantum Computing and Engineering (QCE), Bellevue, WA, USA, pp. 1325-1334, doi: 10.1109/QCE57702.2023.00150.
- Guangxian, X., Jibei, N. and Fei, M. (2022) "A Quantum Blind Signature Network Coding Scheme Based on Particle Entanglement," 2022 IEEE 4th International Conference on Civil Aviation Safety and Information Technology (ICCASIT), Dali, China, pp. 108-112, doi: 10.1109/ICCASIT55263.2022.9987146.
- Huang, Z., Qian, L. and Cai, D. (2022) "Analysis on the recent development of quantum computer and quantum neural network technology," 2022 IEEE International Conference on Artificial Intelligence and Computer Applications (ICAICA), Dalian, China, pp. 680-684, doi: 10.1109/ICAICA54878.2022.9844614.
- Jain, S., Gandhi, A., Singla, S., Garg, L. and Mehla, S. (2022) "Quantum Machine Learning and Quantum Communication Networks: The 2030s and the Future," 2022 International Conference on Computational Modelling, Simulation and Optimization (ICCMSO), Pathum Thani, Thailand, pp. 59-66, doi: 10.1109/ICCMSO58359.2022.00025.
- Konar, D., Gelenbe, E., Bhandary, S., Das Sarma, A. and Cangi, A. (2023) "Random Quantum Neural Networks for Noisy Image Recognition," 2023 IEEE International Conference on Quantum Computing and Engineering (QCE), Bellevue, WA, USA, pp. 276-277, doi: 10.1109/QCE57702.2023.10240.
- Li, H. (2024) "A Quantum-Classical Codesign Framework for Security Enhanced Quantum Networks," 2024 5th Information Communication Technologies Conference (ICTC), Nanjing, China, pp. 76-81, doi: 10.1109/ICTC61510.2024.10602299.
- Li, J., Jia, Q., Xue, K., Wei, D. S. L. and Yu, N. (2022) "A Connection-Oriented Entanglement Distribution Design in Quantum Networks," IEEE Transactions on Quantum Engineering, vol. 3, pp. 1-13, Art no. 4100513, doi: 10.1109/TQE.2022.3176375.
- Lohof, F., Götting, N. and Gies, C. (2023) "Leveraging Quantum Dynamics for Physical Computing Applications," 2023 IEEE International Conference on Quantum Computing and Engineering (QCE), Bellevue, WA, USA, pp. 320-321, doi: 10.1109/QCE57702.2023.10262.
- Moreolo, M. S., Nadal, L., Fabrega, J. M. and Vilchez, J. (2023) "Photonic and Quantum Communication Technologies for Optical Networks Evolution," 2023 23rd International Conference on Transparent Optical Networks (ICTON), Bucharest, Romania, pp. 1-4, doi: 10.1109/ICTON59386.2023.10207227.
- Nishimura, H. (2013) "Quantum network coding — How can network coding be applied to quantum information?," 2013 International Symposium on Network Coding (NetCod), Calgary, AB, Canada, pp. 1-5, doi: 10.1109/NetCod.2013.6570840.
- Pande, M. B. (2023) "Use Cases of Quantum Networks for Industry and Science," 2023 7th International Conference On Computing, Communication, Control And Automation (ICCUBEA), Pune, India, pp. 1-6, doi: 10.1109/ICCUBEA58933.2023.10392063.
- Sadkhan, S. B. and Abbas, R. (2021) "The Role of Quantum and Post-Quantum Techniques in Wireless Network Security - Status, Challenges and Future Trends," 2021 4th International Iraqi Conference on Engineering Technology and Their Applications (IICETA), Najaf, Iraq, pp. 296-302, doi: 10.1109/IICETA51758.2021.9717867.
- Safari, A. and Ghavifekr, A. A. (2022) "Quantum Technology & Quantum Neural Networks in Smart Grids Control: Premier Perspectives," 2022 8th International Conference on Control, Instrumentation and Automation (ICCIA), Tehran, Iran, Islamic Republic of, pp. 1-6, doi: 10.1109/ICCIA54998.2022.9737203.
- Sridhar, G. T., P., A. and Tabassum, N. (2023) "A Review on Quantum Communication and Computing," 2023 2nd International Conference on Applied Artificial Intelligence and Computing (ICAAIC), Salem, India, pp. 1592-1596, doi: 10.1109/ICAAIC56838.2023.10140821.
- Zhang, J., Li, Z., Xiao, J. and Li, M. (2022) "Neural Network Model Reconstructed from Entangled Quantum States," 2022 International Joint Conference on Neural Networks (IJCNN), Padua, Italy, pp. 1-8, doi: 10.1109/IJCNN55064.2022.9892246.