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Interferences in 5G and Beyond 5G (B5G) Networks: Classification, Sources and Methods of Management Review

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Abstract

Interference is a significant challenge in the design and operation of 5G mobile networks and beyond 5G (B5G) systems. Increasing network density, intensive reuse of the radio spectrum, and the deployment of advanced transmission technologies lead to high levels of interference, which can significantly limit system performance. Recent literature, including the comprehensive analysis by Trabelsi et al., emphasizes the complexity of interference management in modern networks [1].This article reviews interference in 5G and B5G networks. The paper provides a precise classification of interference types, examines their sources and generation mechanisms, and presents both classical methods and hybrid and intelligent interference management approaches. By structuring and synthesizing the literature, the article provides a coherent and accessible perspective on current challenges and future research directions.

Keywords: 5G and B5G Networks, Wireless Interference, Interference Management, Internumerology Interference, Massive MIMO, Machine Learning.

Introduction

5G mobile networks mark an essential milestone in the evolution of wireless communications, responding to the ever-increasing demands for capacity, low latency, and massive connectivity. These objectives are achieved through advanced technologies, including network densification, aggressive radio spectrum reuse, beamforming techniques, and massive MIMO systems. However, the benefits of these technologies are accompanied by a significant increase in interference, which has become a major limiting factor for network performance. In 5G networks, interference occurs both within cells of the same type and across different network layers, particularly in heterogeneous scenarios that include macrocells, small cells, and femtocells. In addition, the flexibility introduced by the 5G New Radio (NR) interface, which enables simultaneous use of multiple numerologies and dynamic resource allocation, has led to the emergence of new types of interference not encountered in previous generations. In recent years, the issue of interference has been intensively studied in the specialized literature. The survey conducted by Trabelsi et al. is notable for its comprehensive analysis of interference management methods in 5G and Beyond 5G networks, highlighting both the complexity of the phenomenon and the diversity of proposed solutions. This work constitutes an important starting point for understanding interference as a structural phenomenon of modern networks. Building on these contributions, the review provides a structured synthesis of existing knowledge, aiming to clarify fundamental concepts and to highlight the relationships among types of interference, their sources, and the management methods used now and in the future.

Role of Interference in 5 G and B5 G Mobile Networks

The architecture of 5G systems is designed to meet much stricter requirements compared to previous generations, such as increased traffic capacity, support for low-latency applications and uses a number of mechanisms that, although improving overall performance, naturally lead to increased interference phenomenon. A central element of the 5G architecture is network densification through the deployment of numerous small cells. These are often implemented within macro cells to increase local capacity and improve coverage in high-traffic areas. As a result, the same frequency band is reused at much shorter distances than in traditional systems, leading to interference between nearby cells. In this context, interference is no longer a rare event, but a permanent feature of the network. In addition to densification, aggressive reuse of the radio spectrum is a major contributor to increased interference.

In 5G networks, frequency reuse factor one is commonly adopted to maximize spectral efficiency. Although this approach allows a significant increase in capacity, it implies that signals transmitted by different cells may interfere, particularly at cell edges or in areas where coatings overlap. Another critical aspect of the 5G networks is the flexibility introduced by the New Radio radio interface, which enables the simultaneous use of multiple numerologies. This flexibility is necessary to support services with very different requirements, such as broadband communications, ultra-reliable low-latency communications, and Internet of Things (IoT) applications.

The coexistence of different numerologies in the same frequency band leads to the loss of perfect orthogonality between signals and, implicitly, to the appearance of new types of interference specific to 5G networks. Advanced transmission technologies, such as beamforming and massive MIMO, also play a dual role in interference management. On the one hand, they allow radio energy to be concentrated toward the desired user, reducing interference in other directions. On the other hand, the simultaneous use of multiple beams and imperfect radio channel estimation can lead to inter-beam interference or inter-user interference, especially in high-mobility scenarios. Thus, interference becomes closely related to how the network's spatial resources are managed.

The evolution toward B5G networks further amplifies the role of interference in the design of communication systems. The integration of non-terrestrial networks, the use of reconfigurable intelligent surfaces (RIS), and the exploration of very high-frequency bands introduce new dimensions of interference, both spatial and temporal. Under these conditions, interference can no longer be addressed exclusively by local or static techniques; it requires adaptive, coordinated mechanisms that account for network dynamics and the diversity of use scenarios. Therefore, interference must be regarded as a structural element of the 5G and B5G networks, rather than an accidental imperfection of the system.

Classification of Interference in 5 G and B5 G Networks

To effectively analyze and manage interference in 5G and B5G networks, a precise classification is required. Interferences do not all manifest in the same way or share the exact causes, and their unitary treatment often yields ineffective solutions. For this reason, the literature on this specialty proposes several classification criteria that enable a structured understanding of interference.

In this article, interference is classified based on the mode of occurrence and the relationship between the entities involved. Thus, the interferences can be grouped into co-tier interferences, cross-tier interferences, as well as 5G radio network-specific interferences, such as interferences generated by the coexistence of different numerologies - Internumerology Interference (INI). [1, 2].

Co-tier Type Interference

Co-tier interference occurs between entities at the same layer of the network architecture that use the same frequency resources. Typical examples include interference between two neighboring macrocells or between two small cells located in proximity. This type of interference is a direct consequence of frequency reuse with a factor one, which is widely adopted in 5G networks. In a typical dense network scenario, several small cells are installed in the same area to increase local capacity. Since they operate on the same frequency band (frequency reuse factor equal to one), signals transmitted by a cell can be received as interference by users served by neighboring cells. The level of co-tier interference depends on several factors, such as cell spacing, transmission power, traffic load, and user distribution. Co-tier interference is particularly relevant in 5G networks in dense urban environments and indoor spaces, where cell density is high. Although these interferences can be partially reduced by power control techniques or intelligent resource scheduling, they cannot be eliminated and are inherent to network architecture.

Cross-Tier Interference

Cross–tier type interference occurs between entities at different levels of the network architecture, for example, between a macro cell and a small cell or between a macro cell and a femtocell. These interferences are characteristic of heterogeneous networks and represent a significant challenge for the implementation of 5G in real-world scenarios. A frequent case of cross-tier interference occurs when a user connected to the macro cell is at the edge of the coverage area and transmits with high power to maintain link quality. This signal can produce severe interference on a nearby enamel cell or femtocell, affecting users connected to them. Similarly, downlink transmission of the macro cell may generate interference for users served by the reduced-size cells. Cross-tier interference is challenging to manage due to significant differences in network levels in terms of transmission power, coverage area and user mobility. For this reason, they require more sophisticated coordination mechanisms than co-tier interference, which is often dealt with by dedicated interference management techniques in heterogeneous networks.

Interference Generated by the 5G Radio Interface

In addition to classic co-tier and cross-tier interference, 5G networks introduce new forms of interference arising from the flexibility of the New Radio radio interface. One of the most relevant categories is interference arising from the coexistence of different numerologies within the same frequency band.

In 5G networks, different numerologies are used to serve services with distinct requirements, such as broadband communications or ultra-reliable low-latency communications. When these numerologies are placed in spectral proximity, the signals are no longer perfectly orthogonal and the energy of one signal can interfere with the other. This type of interference is known as internumerology interference (INI) and is specific to the 5G architecture [1, 3, 4].

Internumerology interference is not caused by noise or by small distances between cells, but by differences in the structure of the signals used. For this reason, they require management solutions at the physical level, such as the use of protection bands, signal filtering or interference cancellation techniques.

Spatial Interference and Interference Associated with Advanced Technologies

The use of beamforming and massive MIMO technologies introduces an additional spatial dimension to interference classification. Although these technologies enable radio energy to be directed to intended users, they can generate interbeam interference when spatial separation is imperfect or when channel estimation is affected by errors.

An important example is pilot contamination, which occurs when the same pilot sequences are reused in different cells. In this case, channel estimation becomes inaccurate, and the generated beams may interfere with unintended users. These interferences are particularly relevant in networks with high cell density and high antenna counts.

Extending the Classification to B5G Networks

In B5G networks, interference classification expands to include new sources arising from the integration of non-terrestrial networks, reconfigurable intelligent surfaces (RIS), and communications in very high-frequency bands. In these scenarios, interferences can have three-dimensional geometry and vary rapidly over time, which significantly complicates management. Therefore, the classification of interference in 5G and B5G must be understood as a dynamic process that evolves with network architecture and technologies.

Co-channel Type Interference and Adjacent Channel Type Interference

Depending on the spectral relationship between the signals involved, interferences can be classified as co-channel or adjacent-channel. While these concepts are well known from previous generations of cellular systems, they remain relevant in the context of 5G and B5G networks, where new radio access architectures and mechanisms further amplify their significance.

Co-channel interference occurs when two or more transmissions use the same frequency band. In 5G networks, this type of interference is closely related to frequency reuse with a factor one, which is adopted to maximize spectral efficiency. Thus, the signal transmitted by a cell may be received as interference by users connected to a neighboring cell operating on the same frequency. Co-channel interference is prevalent at cell edges and in dense scenarios, where cell spacing is reduced.

In heterogeneous architectures, co-channel interference can occur in both co-tier and cross-tier scenarios. For example, two close small cells may generate co-channel interference. In contrast, a macro cell and an enamel cell may produce co-channel interference if operating in the same frequency band. In this sense, co-channel interference can be considered one of the main forms of structural interference in 5G networks and is directly influenced by spectrum planning and reuse. Adjacent-channel interference occurs when signals transmitted in adjacent frequency bands interfere with each other due to imperfect filtering and the hardware characteristics of transmitters and receivers. In 5G, this type of interference is particularly relevant in scenarios involving carrier aggregation, simultaneous use of multiple numerologies, or the coexistence of multiple services in adjacent bands. The energy of a signal can leak into the adjoining band, degrading reception of the useful signal.

Unlike co-channel interference, adjacent-channel interference is not caused by direct reuse of the same frequency but by practical limitations of radio components and the structure of transmitted signals. Although the level of this interference is generally lower than that of co-channel interference, its impact can become significant in high transmission-density scenarios or in applications that impose strict reliability and latency requirements. In the context of 5G and B5G networks, co-channel and adjacent-channel interference should not be analyzed in isolation but rather in correlation with other types of interference. For example, internumerology interference may have both co-channel and adjacent-channel components, depending on the resource allocation mode and the spectral separation between numerologies. Therefore, the inclusion of this classification provides a complementary perspective on interference and contributes to a more complete understanding of the challenges in modern networks.

Sources and Mechanisms for Generating Interference in 5G and B5G Networks

After classifying the types of interference, it is essential to analyze the sources and mechanisms leading to their occurrence. In 5G and B5G networks, interference is not generated by a single factor, but results from the interaction of multiple architectural, physical, and operational elements. Understanding these mechanisms is necessary for designing effective interference management methods. Generally speaking, sources of interference can be grouped into three main categories: architectural sources, radio interface-related sources, and sources specific to advanced technologies introduced in 5G and B5G.

Architectural Sources of Interference

One of the main sources of interference in 5 G networks is the heterogeneous network architecture. The coexistence of macrocells, femtocells, and small cells in the same geographical area results in coverage overlap and the reuse of the same frequency resources. This network densification, necessary to increase capacity, causes both co-tier and cross-tier interference.

Reusing frequency with a factor one is a fundamental mechanism that amplifies architectural interference [1, 2]. Because cells use the same frequency band, signals from neighboring cells can be received as interference, particularly in cell edges. This phenomenon is accentuated in dense urban environments and indoor settings, where the intercell distance is small.

Also, uneven traffic distribution and user mobility contribute to increased interference. Users at the cell edge or in weak signal areas transmit at higher power, thereby generating additional interference for adjacent cells. Thus, architectural interference is closely related to the network structure and how resources are reused.

Sources of Radio Interface Interference

The 5G New Radio radio interface introduces significant flexibility in transmission configuration, but this flexibility is also an important source of interference. The use of multiple numerologies, carrier aggregation, and dynamic resource allocation results in scenarios in which signals with different structures coexist in the same frequency band. The coexistence of different numerologists is a direct source of inter-numerology interference. Since numerologies have different symbol durations and different spacing between subcarriers, perfect orthogonality can no longer be maintained. Consequently, the energy of one signal can expand in the band occupied by another signal, generating interference even in the absence of direct reuse of the same subcarriers.

Aggregating carriers are another relevant source of interference at the radio interface. Although this technique increases data throughput by using multiple frequency bands simultaneously, it can lead to adjacent-channel interference due to imperfect filtering and hardware limitations in radio components. The impact of this type of interference becomes critical in applications that impose strict reliability and latency requirements. [3, 4].

Interference Sources Associated with Beamforming and Massive MIMO Technologies

Beamforming and massive MIMO technologies introduce a new dimension to interference analysis: the spatial dimension. By using a large number of antennas, base stations can separate users by direction, reducing interference to other areas of the network. However, spatial separation is not perfect under actual operating conditions. A major source of interference in this context is pilot contamination, which occurs when the same pilot sequences are reused in different cells. This reuse leads to inaccurate radio channel estimates, and generated beams can be incorrectly routed, producing interference to unintended users. Pilot contamination is considered a fundamental limitation of massive MIMO systems, particularly in dense networks. In addition, user mobility and rapid radio channel variations can lead to overlapping beams or degradation of spatial separation. Under such conditions, spatial interference can increase significantly, affecting overall network performance.

Emerging Sources of Interference in B5G Networks

The evolution towards B5G networks introduces new sources of interference associated with the integration of innovative technologies and usage scenarios. The integration of non-terrestrial networks, such as satellites or aerial platforms, leads to the emergence of three-dimensional interference, in which signals arrive from variable directions and exhibit different dynamics compared with traditional terrestrial networks. Additionally, the use of reconfigurable smart surfaces (RIS) can influence signal propagation in a controlled manner, but improper configuration can generate additional interference in unintended areas. In addition, exploring very high-frequency bands and integrating communications with sensing functions introduces new interference mechanisms that require dedicated models and solutions.

Synthesis

The sources of interference in 5G and B5G are multiple and interconnected, arising from both the network architecture and the transmission mechanisms and advanced technologies employed. Interference must be seen as a structural phenomenon, the result of the compromises required to achieve the performance requirements of modern systems. Understanding these sources is the basis for analyzing and designing interference management methods.

Classic Methods of Interference Management in 5G Networks

Classic interference management methods are the basis on which modern solutions used in 5G networks have been built. Although many of these techniques were introduced in earlier generations of cellular systems, they remain relevant and have been adapted to address the increased complexity of heterogeneous networks and the demands imposed by new services. The primary purpose of these methods is to reduce interference, thereby maintaining the network's overall performance at an acceptable level.

In general, classical interference management methods can be grouped by the domain in which they operate. In this way, we have the frequency, time, power, and space domains. These methods are often used in combination to achieve an appropriate trade-off between spectral efficiency and interference level [2-5].

Intercell Interference Coordination ICIC

Intercell interference coordination (ICIC) is one of the most widely used classical methods for reducing interference in cellular networks. The basic principle of ICIC is to coordinate the allocation of frequency resources between neighboring cells so that the same resources are avoided in interference-sensitive areas, such as cell edges. In practice, ICIC involves the exchange of information between base stations regarding interference and traffic load. Based on this information, cells may decide to limit the use of certain frequency subbands or adjust transmission parameters. Although ICIC is effective at reducing interference, it can minimize spectral efficiency because not all resources are used simultaneously.

Extensions of ICIC for Heterogeneous Networks eICIC and FeICIC

In heterogeneous networks, cross-tier interference is often too severe to be effectively managed by conventional ICIC methods. To address this challenge, extensions of ICIC have been developed, including enhanced ICIC (eICIC) and further enhanced ICIC (FeICIC). The eICIC method introduces the concept of Almost Blank Subframes (ABS), in which macro cells significantly reduce transmission power or temporarily suspend transmission within certain time intervals. This mechanism allows the enamel cells to serve users without being affected by the strong interference generated by the macro cells. FeICIC extends this approach by employing additional techniques to cancel residual interference at the receiver [1-5].

Transmission Power Control

Power control is the classic and effective method of reducing interference at the source. By dynamically adjusting transmission power, the network can limit interference to other cells while maintaining link quality for its own users. In 5G networks, power control is employed on both the uplink and the downlink. Users near the base station can transmit at lower power, reducing interference to neighboring cells. In contrast, users at the cell edge can benefit from specific adjustments to ensure an adequate received signal level. Although power control is relatively simple to implement, its efficiency is limited in high-cell-density scenarios.

Resource Partitioning and Fractional Frequency Reuse

Partitioning resources in time and frequency is another classic method of interference management. A well-known example is frequency fractional reuse, in which the frequency band is divided into subbands used differently by users located at the cell center and at the cell edge. Through this approach, interference-sensitive users benefit from fewer reused resources, while users in strong signal areas can use aggressively reused resources. Although this method reduces cell-edge interference, it entails a trade-off between interference reduction and efficient spectrum use.

Resource Programming and Time Interference Management
Radio resource programming plays an important role in interference management by dynamically allocating resources based on channel conditions and interference levels. By avoiding the simultaneous allocation of the same resources to users in sensitive areas, smart programming can significantly reduce interference. This approach is convenient when combined with other classical methods, such as power control or intercell coordination. However, programming efficiency depends on the accuracy of channel information and the network's ability to respond quickly to variations in radio conditions.

Limitations of Classical Methods

Although classical interference management methods are essential and widely used, they present limitations in the context of 5G and B5G networks. Increasing cell density, service diversity, and the use of advanced technologies reduce the efficiency of static or poorly coordinated solutions. In many scenarios, classical methods cannot effectively handle dynamic and multidimensional interference, which justifies the need for hybrid and adaptive approaches.

Hybrid and Intelligent Methods of Interference Management in 5 G and B5 G Networks
Complexity increased in 5G networks, and the evolution towards 5G has highlighted the limitations of classical interference management methods. The rapid densification of the network, the diversity of services, and the dynamic radio environment led to scenarios in which static or poorly coordinated solutions are no longer sufficient. In this context, hybrid and intelligent methods have emerged, combining established techniques with advanced mechanisms for adaptation and optimization.

Hybrid methods aim to exploit the advantages of several control domains, such as time, frequency, power and space, in a unified framework. At the same time, smart allocations use contextual information and learning algorithms to tailor interference management decisions to actual network operating conditions. Hybrid and intelligent interference management approaches that combine classical coordination with machine learning algorithms are considered promising directions for B5G systems. [1-7].

Common Optimization of Radio Resources
One of the main directions in intelligent interference management is the joint optimization of radio resources. Unlike classical methods, which deal separately with frequency resource allocation, power control or beam management, joint optimization aims at simultaneous coordination of these parameters. In 5G networks, this approach is particularly relevant in scenarios with beamforming and massive MIMO, where beamforming decisions directly affect interference levels. By simultaneously optimizing time scheduling, frequency allocation, and transmission power, the network can reduce interference without decreasing spectral efficiency.

Hybrid Inter-Numerology Interference Management
Interference poses a specific challenge for 5G radio systems, which cannot be effectively managed by a single technique. For this reason, the solutions proposed in the literature often adopt a hybrid approach, which combines several complementary mechanisms. Thus, the use of protection bands between different numerologies ensures minimal spectral separation, reducing direct interference. This separation can be complemented by filtering techniques and signal windows that limit spectral leakage. In addition, receiver-side interference cancellation methods can be used to reduce residual interference components. The combination of these techniques allows a trade-off between the flexibility of resource allocation and the control over the level of interference.

Use of Artificial Intelligence and Machine Learning
Artificial intelligence and machine learning techniques have become important tools in interference management for 5G and B5G networks.[1-6]. These methods allow the network to learn from historical data and real-time observations, adapting interference management strategies to the variable conditions of the radio environment. By using learning algorithms, the network can anticipate interference and adjust transmission parameters before performance degrades. However, these approaches are generally used in combination with classical methods to ensure the stability and predictability of network behavior. Thus, artificial intelligence does not completely replace traditional solutions, but complements them in a hybrid framework.

Interference Management Assisted by Reconfigurable Intelligent Surfaces (RIS)
Reconfigurable intelligent surfaces represent an emerging technology that can influence the propagation of radio signals by controlling reflections. By properly configuring these surfaces, the energy of the useful signal can be directed to the desired users, while interference to other areas can be reduced. In the context of interference management, reconfigurable smart surfaces can be integrated into a hybrid framework alongside inter-cell coordination techniques and optimization algorithms. However, uncoordinated use of reconfigurable smart surfaces can lead to unintended effects, such as increased interference in other parts of the network. For this reason, control of reconfigurable smart surfaces is often associated with centralized or semi-centralized management mechanisms.

Perspectives for Interference Management in B5G
In B5G networks, interference management must account for new dimensions of the problem, including the integration of non-terrestrial networks, three-dimensional mobility, and the use of very high-frequency bands. In these scenarios, hybrid methods will play a central role, combining coordination between different entities with intelligent coping mechanisms. In addition, the trend toward integrating communications and sensing functions will impose interference management oriented toward the simultaneous optimization of multiple objectives. [1-7]. Thus, future methods will need to be flexible, scalable, and capable of operating in highly dynamic environments.

Future Directions of Research
Analysis of interference types, their sources, and management methods indicates that interference is a structural problem in 5G networks, not merely a side effect of radio spectrum use. As network architecture becomes increasingly complex, interference

evolves in both form and impact on system performance. In this context, an integrated approach is necessary that accounts for the multiple dimensions of the phenomenon.

An important aspect that emerges from this literature review is the permanent trade-off between spectral efficiency and interference control. Many of the proposed solutions, such as the use of protection bands or resource partitioning, reduce interference but limit spectral efficiency. In future networks, as traffic demand continues to grow, this trade-off will become increasingly difficult to manage, necessitating more flexible and adaptive solutions.

A major research direction is the development of advanced coordination mechanisms between cells and across different layers of the network. Especially in heterogeneous scenarios and those involving the integration of non-terrestrial networks, coordination becomes essential to limit cross-tier and three-dimensional interference. Future research should focus on scalable methods that operate efficiently in networks with large numbers of nodes and dynamic topologies. Another area of interest is the use of artificial intelligence in interference management. Although machine learning algorithms enable rapid adaptation to network conditions, their use poses challenges related to stability, interpretability, and complexity. One promising direction is to integrate artificial intelligence into a hybrid framework in which critical decisions are guided by well-defined rules and constraints, and learning algorithms are used to fine-tune parameters. In the context of B5G networks, new challenges arise from interference in very high-frequency bands and the integration of communications and sensing functions. These scenarios require the development of novel interference models and management mechanisms that simultaneously optimize communication performance and the accuracy of sensing functions. Thus, future research will need to adopt a multidisciplinary perspective that integrates concepts from communication, signal processing, and artificial intelligence. Overall, future research directions indicate a transition from static, local interference-management methods to dynamic, coordinated, and intelligent solutions. [1-6]. This transition is essential to support the increasingly diverse requirements of emerging applications and to ensure the efficient operation of 5G and B5G networks.

Conclusions

Interferences are one of the main challenges in the design and operation of 5 G and B5 G mobile networks, being closely related to the heterogeneous network architecture, aggressive spectrum reuse and the use of advanced transmission technologies. The analysis presented in this review highlights that interference is not an accidental phenomenon, but a structural element of modern wireless communication systems. Thus, a detailed classification of the main types of interference relevant to 5G and B5G was carried out, including co-tier and cross-tier interference, internumerology interference, spatial interference associated with beamforming and massive MIMO technologies, as well as emerging interference specific to B5G systems. This classification has been correlated with sources and mechanisms of interference generation, providing coherent insight into how different network components contribute to performance degradation.

This review examined both classic interference management methods, which remain essential in many scenarios, and hybrid and intelligent approaches developed to address the increased complexity of modern networks. The analysis highlighted that classical methods, although robust and well understood, are often ineffective in dense and dynamic scenarios, which require their integration with adaptive, coordinated, and AI-assisted mechanisms.

In the context of the evolution towards B5G networks, interference management becomes even more complex, as a result of the emergence of dynamic topologies, the use of very high frequency bands and the integration of communications with a sensing function. Under these conditions, future solutions must simultaneously optimize communication performance and sensing accuracy while maintaining a high level of spectral efficiency. In conclusion, this review provides a structured synthesis of interference in 5G and B5G networks, highlighting current and future research directions in this field. The work contributes to a better understanding of interference and can serve as a helpful starting point for further research and the development of advanced interference management solutions.

References

1. Trabelsi, N. (2024). Interference management in 5G and beyond networks: A comprehensive survey. Computer Networks.
2. Saquib, N., Hossain, E., Le, L. B., Kim, D. I. (2012). Interference management in OFDMA femtocell networks: Issues and approaches. IEEE Communications Magazine, 50(11), 70-79.
3. Sreedhar, M. (2022). Inter-numerology interference in 5G New Radio. In Proceedings of the IEEE International Conference on Communications (ICC).
4. Cevikgibi, B. A. (2022). Inter-numerology interference pre-equalization for 5G mixed-numerology communications.
5. 3rd Generation Partnership Project (3GPP). (2023). NR and NG-RAN overall description (3GPP TS 38.300).
6. Saad, W. (2021). A vision of 6G wireless systems. IEEE Network, 35(3), 134-142.
7. Niu, Y. (2024). Interference management for integrated sensing and communication systems: A survey.