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# Wireless Compressed Image Transmission Over DST Based OFDMA System Using RSA Encryption

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**ABSTRACT:** In this journal, we explore the implementation of a wireless compressed-image transmission system employing the RSA encryption algorithm. The project's primary goal is to enhance the efficiency of transmitting visual content over a wireless channel while ensuring data security. This work encompasses various aspects, including image compression, DST-based OFDMA modulation, and RSA encryption. The research is motivated by the increasing demand for high-quality image transmission in applications such as multimedia, medical imaging, and remote sensing. This journal provides insights into the system's design, challenges, and potential contributions to modern communication technology.

**KEYWORDS:** - DST-Discrete Sine Transform, OFDMA-Orthogonal Frequency Division Multiple Access

## I. INTRODUCTION

The rapid evolution of digital communication technologies has revolutionized the way we share and access visual content. The demand for efficient transmission of images has grown significantly, encompassing applications from entertainment and social media to critical domains like healthcare and environmental monitoring. However, to meet this demand, we face the challenge of optimizing bandwidth utilization, particularly in wireless communication environments where resources are limited.

One critical aspect of addressing this challenge is image compression. By converting image data into a compressed format, it becomes feasible to transmit visual content more efficiently, reducing the data payload while preserving essential visual details. This not only saves bandwidth but also enables faster transmission and improved user experiences.

While image compression is a crucial step in this process, ensuring the security of transmitted images is equally essential. The RSA (Rivest-Shamir-Adleman) encryption algorithm is a widely adopted method for data security, offering strong protection against unauthorized access.

This journal explores the integration of image compression and RSA encryption in a wireless transmission system. We leverage the principles of Discrete Fourier Transform-based Orthogonal Frequency Division Multiple Access (DFT-OFDMA) to further enhance the transmission efficiency. The amalgamation of these technologies aims to provide a comprehensive solution for efficient, secure, and high-quality wireless image transmission.

In the subsequent sections of this journal, we delve into the technical aspects of the system's design, challenges encountered, and potential implications for modern communication technology. We present a detailed analysis of the project's methodology and results, shedding light on the promising prospects of this approach in addressing the fundamental aspects of modern communication.

## II. RELATED WORKS

Wireless Compressed-Image Transmission Using RSA Algorithm includes studies on image compression techniques like JPEG, research on data encryption in wireless communication, investigations into OFDMA modulation, and

research on multimedia transmission, medical imaging, and remote sensing applications. Additionally, studies on wireless communication security, modern communication technologies, hardware and software implementations, communication standards, and user experience in wireless communication are all relevant to understanding and advancing this project's objectives.

### III.EXISTING METHOD

The existing system's functionality, which involves compression, encryption, wireless transmission, decryption, and quality assessment, offers a solid foundation for secure image transfer. However, to remain relevant and effective in the future, it needs to adapt to changing technological landscapes, including the integration of emerging wireless communication standards like 5G, IoT, and advanced security measures.

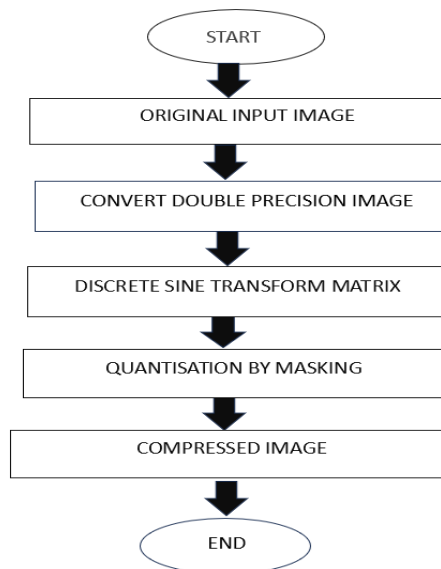
### IV.PROPOSED SYSTEM

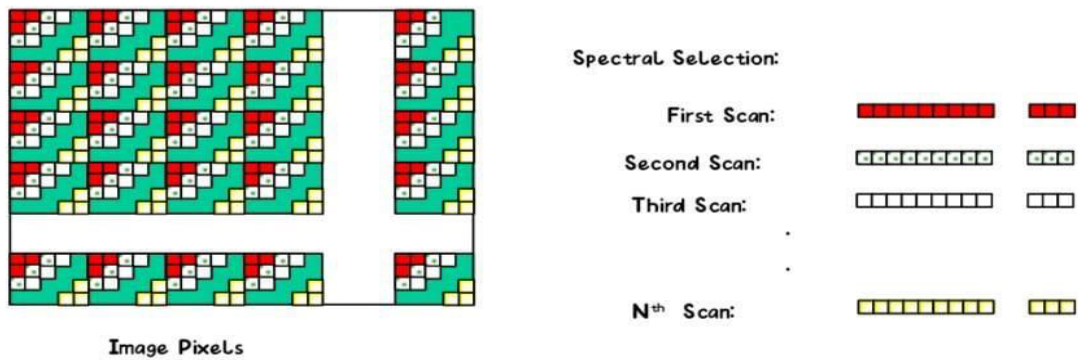
In proposed system for wireless compressed image transmission using the RSA algorithm, the process begins with compressing the image to reduce its size while preserving important visual details. The compressed image is then encrypted with RSA for security. This encrypted image is transmitted wirelessly, where it is received and decrypted at the destination. Following decryption, the image is decompressed to its original format. Quality is assessed, and error handling mechanisms are in place to address any data loss or corruption during transmission. This system ensures efficient and secure image transfer over wireless networks.

### V.BLOCK DIAGRAM

In a Wireless OFDMA system with RSA encryption, images are first compressed using standard techniques, then encrypted with a public key. The encrypted data is divided into subcarriers for transmission. Multiple users access the channel, each sending their data. At the receiver end, the data is decrypted with a private key, then decompressed to display or store the original image. This approach combines efficient spectrum usage with data security for wireless image transmission.

Fig:1 Flow Chart





It allows a coarse version of an image to be transmitted at a low rate, which is then progressively improved over subsequent transmissions. Spectral Selection: Send DC component and first few AC coefficients first, then gradually some more Acs

### VI. EXPERIMENTAL RESULTS

Image Compression is a useful technique that helps in saving memory space and time during the transmission of image over a network. This helps increase the storage capacity and also the Transmission Speed. The methodology is stimulated with the help of MATLAB program. MATLAB provides efficiency in using the functions as its interface helps the user through the processor of Encryption and Decryption, from and into cover.



Fig2&3 Original & Compressed Image

### VII. FUTURE SCOPE

The future scope for this system is promising. It entails advancements in security measures, optimization for faster transmission, integration with emerging technologies like 5G and IoT, and a focus on user-friendly interfaces. Additionally, exploring AI-driven error handling and blockchain integration to enhance transparency and tamper resistance in image transmission records will be key areas of development. The system's ability to adapt to evolving technological landscapes while maintaining efficiency and security is vital for its continued relevance across diverse applications, from healthcare to surveillance.

### VIII. CONCLUSION

In conclusion, the concept of wireless compressed image transmission using the RSA algorithm represents a valuable and evolving technology in the field of secure data communication. This approach provides an effective means to transmit images over wireless networks while addressing both data efficiency and security concerns. By compressing images to reduce bandwidth requirements and encrypting them using the RSA algorithm to ensure confidentiality, the system strikes a balance between optimization and privacy. As the demand for efficient and secure image transmission continues to grow in various domains, from healthcare to surveillance, this system's future scope lies in its ability to evolve, ensuring that it remains a dependable solution for meeting the ever-evolving requirements of modern communication. security measures will play a pivotal role in shaping the future of wireless compressed image transmission using the RSA algorithm, ultimately contributing to enhanced data privacy and efficient image delivery.

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