

Research and study of steganography techniques and applications.

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Abstract: This study investigates steganographic techniques and their practical applications, focusing on the concealment of secret information within digital media. The research systematically examines fundamental steganographic methods, including Least Significant Bit (LSB) substitution, transform-domain embedding, and adaptive algorithms, analyzing their respective capacities, imperceptibility, and robustness against detection. A comparative evaluation of these techniques is conducted to identify optimal approaches for different application contexts. Furthermore, the study explores the integration of steganography with cryptographic methods to enhance overall security. Practical applications are demonstrated through the development of a prototype system for covert communication, emphasizing real-world usability and resistance to steganalysis. The findings contribute to a deeper understanding of the trade-offs between payload capacity and security, providing a framework for selecting appropriate steganographic techniques for specific requirements. This research underscores the relevance of steganography in information security, offering insights for both academic study and practical deployment in secure data transmission.

Keywords: Steganography, data hiding techniques, applications of data hiding, steganography