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Enhancing the Security of Information/Data Using a Combination of Hill Cipher and Masonic Cipher

Communication Info

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Abstract

Cryptography plays a very important role in maintaining the secrecy of messages/data [1]. Communication through computer networks is growing at a tremendous speed, and many transactions are made via the Internet. Ensuring the confidentiality and integrity of message and data contents becomes very important. The aim in this work is to enhance the security and applicability of a polygraphic substitution cipher based on linear algebra, utilizing the Hill cipher [2, 3] and Masonic cipher for encryption and decryption processes. A 3 by 3 magic square [4] matrix is used as the key matrix. To increase its confusion, the matrix is rotated and then utilized again to perform another linear transformation on the ciphertext, resulting in a new ciphertext. To complete the encryption process, the Masonic cipher technique [5] is then used to get the final ciphertext. The decryption process begins with the Masonic ciphertext, and then the Hill cipher decryption technique is applied twice to recover the plain text.

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