Abstract

RGB color oriented DNA based computing is a new research area in cryptography. In this paper a formal approach to encrypt and decrypt information using colors is proposed. An information or message consists of set of Characters, Symbols, and Digits. Encoding is done using UNICODE, so that any language can be encrypted. After encoding, the message is encrypted and compressed using RGB colors. Each color has its own hexadecimal values;
these hexadecimal values are converted into binary values. These binary values are treated as 2 parts - message and the key. Then the message and the key are compressed by performing XOR operation and the key is encrypted using RSA algorithm. Finally the message is encoded as DNA codons and then transmitted to the receiver. DNA can be used not only to store and transmit information, but also to perform computations. The fundamental idea behind this encryption technique is to enforce DNA concept in cryptographic algorithms and to open the door for applying the DNA and Amino Acids concepts to other conventional cryptographic algorithms so that we can ensure multi-layer security.

References

- Dominik Heider and Angelika Barnekow, "DNA- based watermarks using the DNA-Crypt algorithm", Published: 29 May 2007 BMC.
- Ashish CreForman, Thomas LaBean and John Reif, "DNA-Based Cryptography", DIMACSDNA Based Computers V, American Mathematical Society, 2000.

Index Terms

Computer Science

Security
Keywords
DNA Cryptography  Unicode Encoding  RGB Color Model  Compression  Basic Principles Of Central Dogma Of Molecular Biology