International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
Volume: 03 Issue: 11 | Nov -2016 www.irjet.net p-ISSN: 2395-0072

DATA ENCRYPTION ALGORITHM BASED ON DNA ENCODING AND STEGANOGRAPHY

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ABSTRACT: With the brisk advancement of net innovation and information handle innovation, the learning is unremarkable transmitted by means of the net. The crucial information in transmission is certainly caught by obscure individual or programmer. In order to strengthen the information security, encryption turns into a fundamental examination is bearing. A message cryptography equation bolstered deoxyribonucleic acid(Deoxyribo Nucleic Acid) grouping for displaying amid this paper. The most motivation behind this equation is to compose the message with the start of corresponding tenets deoxyribonucleic corrosive grouping.

Key words: Deoxyribo Nucleic Acid, Cryptography

1. Introduction:

The security of a framework is fundamental these days. With the development of the data innovation control, and with the rise of new advances, the quantity of dangers a client should manage developed exponentially. With the expanding development of transmission applications, security has turned into a significant issue on correspondence. DNA mystery composing is ascending as a fresh out of the plastic new mystery composing field wherever polymer is utilized to hold the learning. The entrancing choices concerning the structure of polymer square measure the reciprocal run the show. These tenets are utilized for proposing message encryption techniques. Message encryption is the way toward transmitting the message stealthily. In the message encryption, the first message is changed into a proportionate option by a positive encoding component. This message is then send to the recipient. An encoding plot by joining the essential substance attributes of natural DNA (Deoxyribonucleic Acid) groupings or structure of purines and pyrimidines could serve as a viable stealth transmission of a message would be secure to the point that it couldn't be effortlessly broken. In the proposed calculation, a DNA grouping or structure is introductory haphazardly taken and correlative standards are encircled so the discharge message to be sent is encoded at the sender's viewpoint. At the recipient's angle, the decoding technique is finished and in this way the first message is extricated out. A DNA succession is an arrangement made out of four unmistakable letters, A, C, G and T. Every nucleotide contains a phosphate joined to a sugar atom (deoxyribose) and one of four bases, adenine (A), cytosine (C), guanine (G), or thymine (T). It is the plan of the bases in an arrangement, for example like ATTGCCAT, that decides the encoded quality. The normal arrangement design with

correlative coding and concoction characterization of the nucleotides can be utilized to shield the message

Fig: security risk

2. Methodology:

Our proposed framework will empower its client to scramble the plaintext message and the resultant figure content is as DNA arrangement which can give better classification to the mystery messages it can likewise be utilized to produce advanced mark which is additionally as DNA successions to give verification. Client will give the plaintext message as information and the framework will create the figure content and advanced mark as DNA succession. This system of DNA cryptography can give two folds of security by including both the atomic strategies and existing calculations. In the event that one security level is broken some way, the other can guard this method.

This is a Four level secure method that makes any attacks almost impossible. This method has been explained step by step in the following:

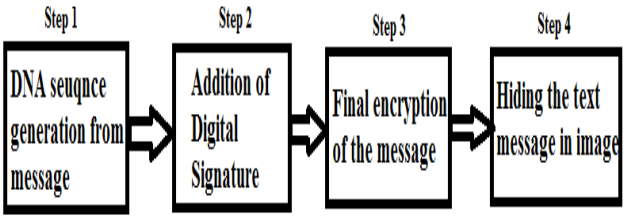

Fig: Generation and Encryption of DNA sequence

Step 1: DNA sequence generation:

DNA sequencing is the way toward deciding the exact request of nucleotides inside a DNA atom. It incorporates any technique or innovation that is utilized to decide the request of the four bases—adenine, guanine, cytosine, and thymine—in a strand of DNA. The approach of quick DNA sequencing strategies has enormously quickened natural and medicinal research and disclosure.

Information of DNA successions has gotten to be irreplaceable for essential natural research, and in various connected fields, for example, medicinal analysis, biotechnology, scientific science, virology and organic systematics. The quick speed of sequencing accomplished with current DNA sequencing innovation has been instrumental in the sequencing of finish DNA successions, or genomes of various sorts and types of life, including the human genome and other finish DNA groupings of numerous creature, plant, and microbial species.

Here a plain text is taken and converted into DNA sequence using code book which is nothing bt a series of nucleotides of DNA which seems nothing like a message.

Code book 1:

CODE	DNA	CODE	DNA	CODE	DNA	CODE	DNA
A	TGCA	H	GACT	O	ATCA	V	TGCT
B	TGAC	I	CGAT	P	TGCC	W	TGTA
C	TAGC	J	GCAT	Q	TCCA	X	TTCA
D	ATGC	K	GCTA	R	CGCA	Y	TAAA
E	ATCG	L	GTCA	S	TGCG	Z	AGAA
F	ACTG	M	GTAA	T	TGGA		
G	CATG	N	GACA	U	GGCA		

Code book 2:

CODE	DNA	CODE	DNA	CODE	DNA	CODE	DNA
a	ACGT	h	TCTG	o	ACTA	v	TCGT
b	CAGT	i	TATT	p	CCGT	w	ATGT
c	CCAA	j	TACG	q	ACCT	x	ACTT
d	CGTA	k	ATAT	r	ACGC	y	AAAT
e	GGCC	l	TAAT	s	GCGT	z	AAGA
f	TTCC	m	AATG	t	AGGT		
g	GTAC	n	ACAG	u	ACGG		

Code book 3:

CODE	DNA	CODE	DNA	CODE	DNA
'.'	TGGG	'$'	GCAA	'()'	CATG
' '	TGTG	%	AGTT	'– '	TGTC
'!'	AGAG	'^ '	TCAT	'+'	CACA
'@'	ACCA	'& '	GCTT	'='	TCGA
'# '	TGTA	'* '	TACC	'~'	AGGC

3.Result and Analysis:

After all the detailed study of various methods used for encryption utilizing DNA along with many problems, this paper has illustrated a more secure way to protect data or

message from the third party attacks that are growing stronger and stronger day by day.

The result obtainted from the method used in this project are :

- Better authenticity: as digital signature is applied it becomes more secure for sender ans receiver to ensure the authentication of message
- Four level security: the level of security defines the difficulty from any attacks and hence here this difficulty has been raised for the attackers.
- Dual cover: the message has been protected by, first the DNA sequence which makes it look nothing like a hidden message and second it is hidden in image which is hard to find.

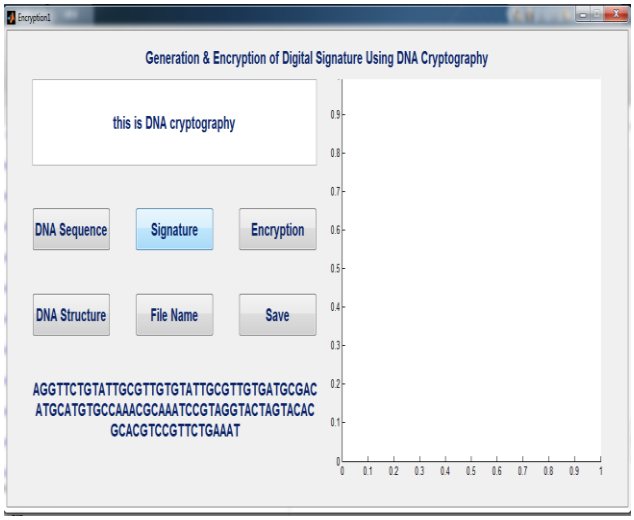

Fig: DNA sequence generation

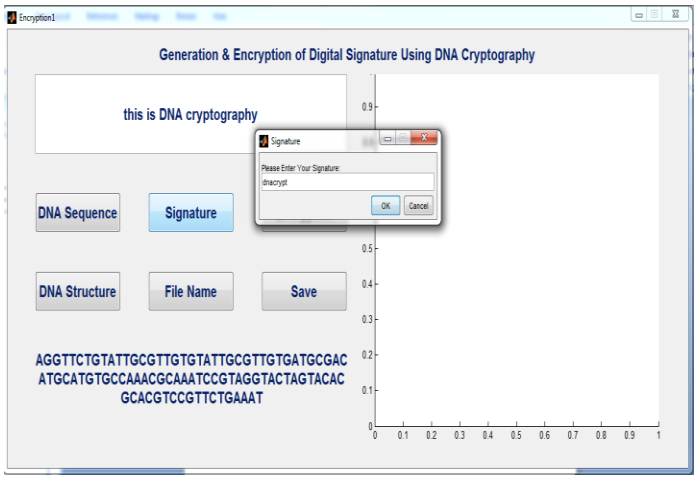

Fig: Digital signature addition

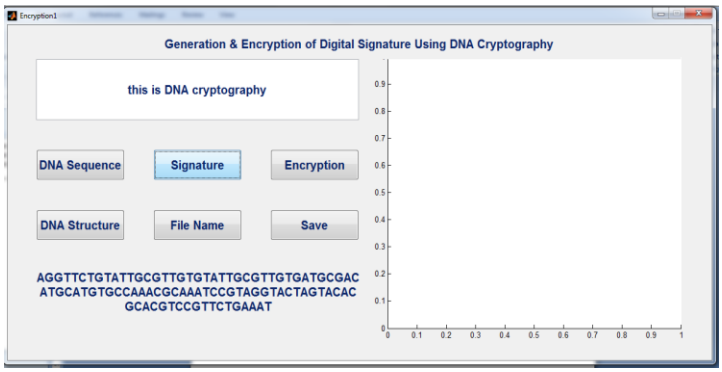

Fig: After digital signature added.

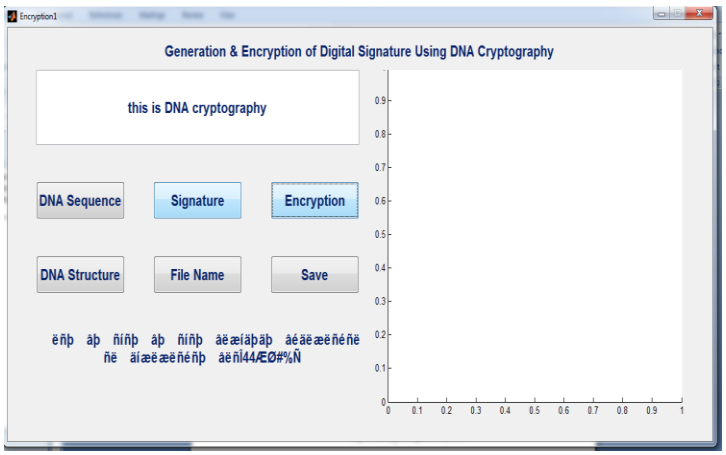

Fig: After Encryption

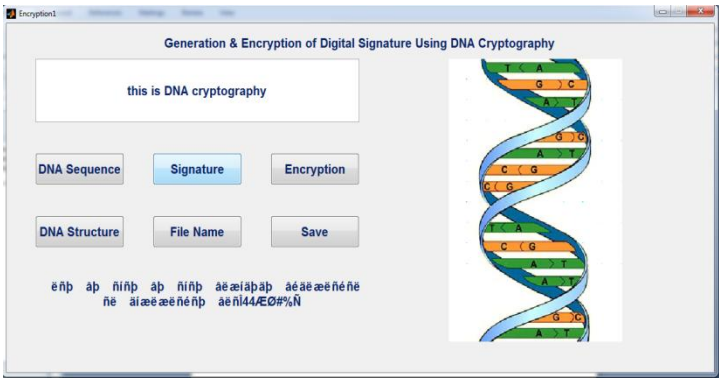

Fig: DNA stegnography

4.Conclusion:

This paper gives a structural system for encryption/unscrambling and era of advanced mark for straightforward content information and content documents utilizing DNA Cryptography. The analyses on plaintext with various substance are performed to test the vigor of the program, and the outcomes demonstrate that the program can deal with the majority of the characters and their blends with high precision and effectiveness, and this demonstrates the program is exceptionally powerful. The encryption process used is highly efficient and secure. Although the AES encryption process used is not defined in MATLAB hence it can be used effectively in further updated version of MATLAB.

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