International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 9 Sep. 2022, pp: 1297-1302 www.ijaem.net ISSN: 2395-5252

Encoding the Text by Using Genetic Algorithms with Thehelp of Bit Swapping Techniques

[1]Gudhi Sarvani, [2]Sirigireddy Sruthi Raj Reddy,
FACULTY IN SRI VIVEKANANDA DEGREE COLLEGE FOR WOMEN, KADAPA
STUDENT OF SRI VIVEKANANDA DEGREE COLLEGE FOR WOMEN, KADAPA.

Date of Submission: 17-09-2022 Date of Acceptance: 28-09-2022

ABSTRACT: This research paper is about to encrypt the text by using genetic algorithms and bit swapping techniques. In the current scenario the usage of internet is increased rapidly. Internet is used in numerous ways to transmit the information.With this internet usage the possibility of manipulating the data is also increasing. Intruders are coming up with countless ways to steal the information. Intruders making consequences to sender and receiver with different types of hacking algorithms. To dope out these consequences it is essential to provide the security to the network. The network security plays a vital role in providing security and integrity to the information. Filters and firewalls are used at workstations to secure the data. To attain the network security various kinds of genetic algorithms and bit swapping techniques are used. These proposed can be useful for small-scale business organizations.

KEYWORDS: Encryption, Decryption, Genetic algorithms, Bit Swapping techniques.

I. INTRODUCTION

In recent years consumers expanded the usage of internet to perform all kind of transactions such as data transmissions and cash transactions. Nowadays the data is being transmitted by either social media or through some communication applications. And maximum people are doing their cash related transactions through online.

So that the use of e-banking and e-billing is increased.

Hence to protect the data that is being transmitted is important task. To do this a concept which is termed as Cryptography will be the useful and well-built concept.

Cryptography is a well- known and an emerged concept which converts the data which is in the readable form to unreadable form. The concept of cryptography is to modify plain text in cipher text. The use of cipher text is to make the plain text harder to read to the intruders. In this cryptography two words are majorly used i.e., Encryption and Decryption. Converting plain text from the cipher text is termed as Encryption. The reverse process which is converting cipher text from the plain text is called ad decryption. Both the encryption and decryption will be done with the help of a key which is termed as secret key or private key.

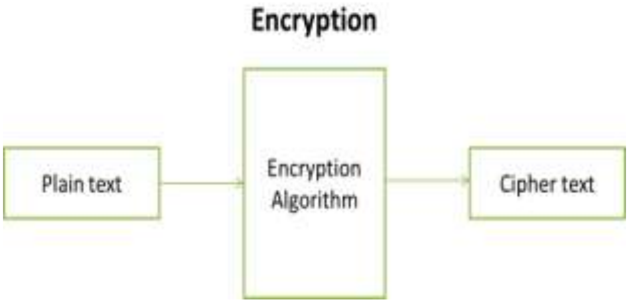


Fig 1: Encryption process

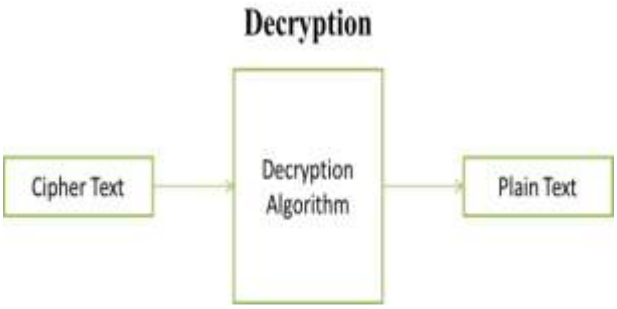


Fig 2: Decryption process

In the cryptography there are two ways to encrypt the text. They are Symmetric key encryption and Asymmetric key encryption respectively. We use single key in symmetric key encryption. This single key is also termed as private key. Here the same key will be used at both the sender and receivers side. For this a key exchange algorithm will be included. Hence another name for symmetric key encryption is Private key Encryption. Likewise in the asymmetric key encryption a pair of keys will be used. Public key and private key namely. On key will be used at sender side and the other ley will be used at receiver side. If public is used at sender side then the remaining private key will be used at receiver side. As well as if private key is used at sender side then the remaining public key will be used at receiver side. Henceforth the asymmetric key encryption is termed as Public key encryption algorithm.

Generic Algorithms

Genetic algorithm is an intensification technique which is formed on principles of Natural Selections and Genetics. Basically genetic algorithms are used to resolve the problems which are arduous and take lifespan to resolve it. Genetic algorithm is the sub segment of the huge segment termed as Evolutionary Computation.These algorithms are designed by John Holland at University of Michigan. Genetic algorithms are random in nature but execution of these algorithms gives effectiveresults contrary to local random search as they make use of documentary information. A “good-enough” solution is “Last-enough” is the major ability of Genetic algorithms.

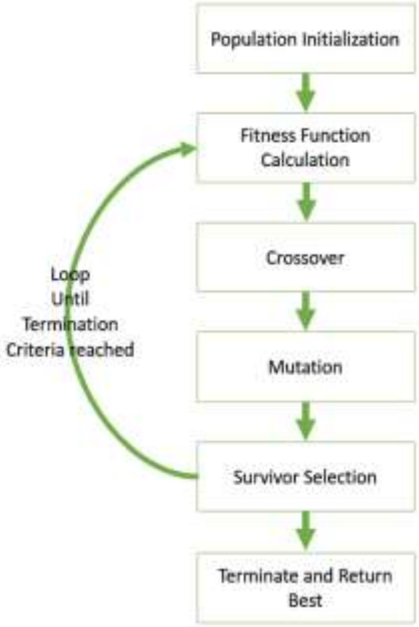

Population Initialization
Fitness Function Calculation
Crossover
Mutation
Survivor Selection
Terminate and Return Best
Loop Until Termination Criteria reached

Fig 3: Basic structure of Genetic algorithm

Genetic algorithms are of different types. The main aim of all these types is to give the good solution to the problem. In the genetic algorithms parent classes and chromosomes terms are used to refer the old class pattern and newly derived class patterns. All these genetic algorithms are works with the bits.

Crossover Function:

One of the operations in genetic algorithms is Crossover function. This crossover operation is used to differentiate the chromosomes of one generation into another generation. From the mating pool two strings has been chosen at random to reproduce the superior offspring. Based on the encoding type the method has been selected. Crossover functions are different kinds termed as single point crossover, k-point crossover, uniform crossover, partially mapped crossover, order crossover, precedence preserving crossover, shuffle crossover, reduced surrogate crossover and cycle crossover. From these types of crossover function uniform crossover function has been used in this paper.

Uniform Crossover:

By using the tossing method interchange of the bits in parent chromosomes will be done in the uniform crossover method. While the tossing if the tossing value is 1 then the interchange will be happened as well as if the tossing value is 0 then no interchange will be happened in the parent chromosomes.

Half uniform crossover:

In this half uniform crossover half of the nonmatching bits will be swapped. At first Humming distance will be calculated. This number is divided by two. The resulting number is how many of the bits that do not match between the two parents will be swapped.

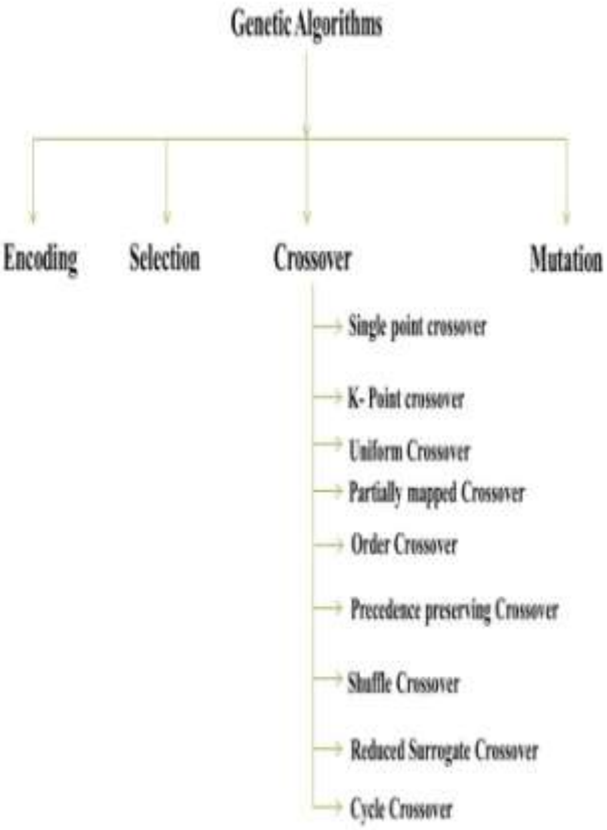


Fig 4: Types of Genetic Algorithms

Bit Swapping techniques:

Bit swapping techniques are used to interchange the position of bits. There are two types of swapping is possible. Even bit swapping and odd bit swapping. In even bit swapping every even position bit is swapped with neighboring bit on the right side. In the same manner Every odd position bit is swapped on the left side.

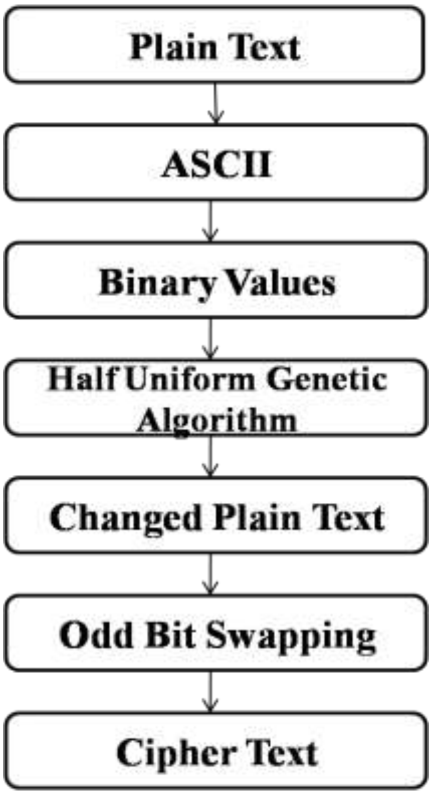
II. PROPOSED SCHEME

Encryption:

In the proposed scheme Half Uniform Crossover and odd bit swapping technique is used to convert the readable text to unreadable text to provide the security to the information.

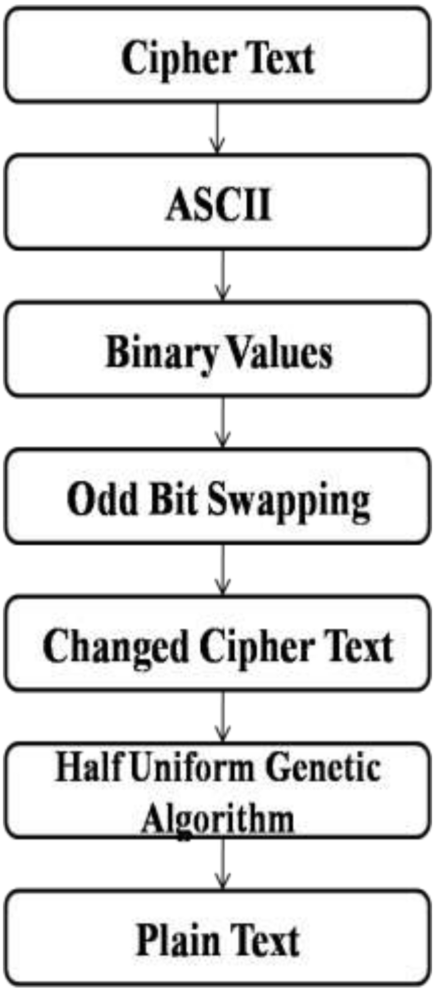
Algorithm:

Step 1: Plain text
Step 2: Take out the ASCII codes for the given plain text
Step 3: Now covert the ASCII values in the binary values.
Step 4: Perform Half Uniform Crossover operation to get the changed text.
Step 5: Apply odd bit swapping to the changed text.
Step 6: Cipher text.



Decryption:
Algorithm:

Step 1: Cipher text
Step 2: Takeout the ASCII codes for the given cipher text
Step 3: Now convert the ASCII codes into the binary values.
Step 4: Apply odd bit swapping for the bit values.
Step 5: Now perform Half Uniform Crossover function.
Step 6: Plain text.



III. RESULT TABLE

Encryption:

PLAIN TEXT	**ASCII**	**BINARY VALUES**	**HALF UNIFORM**	**ODD BIT SWAPPING**	**8 BITS**	**CIPHER TEXT**
P	81	01010000	01000000 01010001	10000000 10100010	10000000	�
R	82	01010010			10100010	�
A	65	01000001	01010001 01011010	10100010 10100101	10100010	�
Y	89	01011001			10100101	�

Decryption:

CIPHER TEXT	ASCII	BINARY VALUES	ODD BIT SWAPPING	HALF UNIFORM	8BITS	PLAIN TEXT
�	128	10000000	01000000 01010001	01010000 01010010	01010000	P
�	162	10100010			01010010	R
�	162	10100010	01010001 01011010	01000001 01011001	01000001	A
�	165	10100101			01011001	Y

IV. CONCLUSION

Network security becomes major issue now a days. To protect the data from the intruders is the biggest challenge for the internet users. To provide the network security number of algorithms has been emerged. In this paper the encryption of the text will be possible by using the Genetic algorithm and bit swapping methods. The Half Uniform Crossover function interchanges the values of bits in parent classes. And the Odd bit swapping method is used to interchange the bit position to left side. By using these two techniques we can encrypt the information.

REFRENCES

[1]. Marin, G.A. (2005), “Network Security Basiscs”, In security & privacy, IEEE, Issue 6, Vol. 3, pp. 68-72, 2005.

[2]. Wuzheng Tan, Maojiang Yang, Feng Ye, Wei Ren, “A security framework for wireless network based on public key infrastructure”, In Proc. Of Computing, Communication, Control and Management, 2009, CCCM 2009, Vol. 2, pp. 567 -570, 2009.

[3]. Wu Kehe, Zhang Tong, Li Wei, Ma Gang, “Security Model Based on Network Business Security”, In Proc. Of Int. Conf. on Computer Technology and Development, 2009,.ICCTD’09, Vol. 1, pp. 577 – 580, 2009.

[4]. Flauzac. O, Nolot. F, Rabat. C, Steffenel. L. A, “Grid of Security: A New Approach of the Network Security”, In Proc. Of Int. Conf. on Network and System Security, 2009. NSS’09, pp. 67 – 72, 2009