**Effective Data Hiding Scheme using Machine Learning**

**ABSTRACT:**

In recent years, chaotic image encryption algorithms with key and plaintext association have been developed, which are essentially similar to a one-time pad at a time because each encryption requires the transmission of the key. However, some existing schemes cannot uniquely map the seed key to the initial value of thvse chaotic system, which leads to the reduction of the key space of the encryption system. In addition, some schemes use the same key to encrypt the same image, which does not conform to the one-time pad strategy. This paper solves these problems from two aspects. On the one hand, random pixels are inserted into a plain image and then a hash value is generated using SHA-256. Different seed keys can be obtained even if the same image is encrypted. On the other hand, the Sequential Expansion Algorithm (SEA) and Feedback Iterative Piece-Wise Linear Chaotic Mapping (FI-PWLCM) are proposed to realize the one-to-one correspondence between the seed key and the encrypted key stream. SEA can quickly generate seed key sensitive and random sequences. FI-PWLCM achieves one-to-one correspondence with the seed key through feedback iteration with more control parameters. The mapping not only has the rapidity of PWLCM, but also can produce more complex chaotic sequences. Besides, this paper proposes a Segmented Coordinate Descent (SCD) method for histogram statistical optimization of images to improve the ability of cryptosystems against statistical attacks. Experiments and security analysis show that the algorithm can resist chosen-plaintext (chosen-ciphertext) attacks, brute force attacks, statistical attacks and so on. Compared with most current algorithms, it achieves the best performance in the statistical properties of histogram and entropy.

**EXISTING SYSTEM:**

To secure data in network Chaotic Image Encryption is more in demand which will encrypt image based on a block cipher is to use a chaotic map to generate secret keys or chaotic sequences to substitute and diffuse the pixels or bits of the image to achieve a higher level of security. In the past many algorithms introduced which cannot uniquely map the seed key to the initial value of the chaotic system, which leads to the reduction of the key space of the encryption system.

**Disadvantages**

1. Less accuracy.

2. Time Taking processes

**PROPOSED SYSTEM:**

To overcome from above issue author of this paper introducing Novel Chaotic image encryption scheme which is a combination of multiple algorithms such as SEA (Sequential Expansion Algorithm), FI-PWLCM (Feedback Iterative Piece-Wise Linear Chaotic Mapping) and SCD (Segmented Coordinate Descent).

Above scheme will execute all 3 algorithms step by step

1. First image will be taken as input and then convert image to 1 dimension vector
2. 10 random pixels will be added to end of the 1 dimension vector
3. SEA and FI-PWLCM will be applied. SEA is a simple and fast pseudo-random sequence generator. FI-PWLCM, which has more control parameters than PWLCM and can generate more complex chaotic sequences
4. SCD will be applied to convert high dimensional optimization problem to low dimensional optimization to reduce key space.

**Advantages**

1. High Accuracy
2. Less Time Taken

**SYSTEM REQUIREMENTS:**

**HARDWARE REQUIREMENTS:**

# Processor - intel i3 or above

* Speed - 1.1 Ghz
* RAM - 4 GB or above
* Hard Disk - 500 GB or above
* Key Board - Standard Windows Keyboard
* Mouse - Two or Three Button Mouse
* Monitor - SVGA

**SOFTWARE REQUIREMENTS:**

Operating System - Windows10 or above

Programming Language - Python