Satya: Steganography Utilizing Individual Pixels

Velingker, Shiva

In a technological age where increased GPU performance is able to crack cryptographic functions faster, stronger and more subtle protection methods are necessary to prevent data loss. The objective of this experiment is to build a program that can successfully embed data directly into the pixels of an image. To accomplish this, the program first converts raw data into its binary format, which creates a string with values of 0, 1 and b (to indicate binary format). This program then loops through the pixels of an image and modifies the color coordinate of each pixel so that when modulated by three (the three values produced by the binary string), the pixel's coordinate value is equivalent to a value of the original binary string. With the data, additional security measures, such as a password and a decrypting algorithm, are also embedded into the image. Using the small divisor of three allowed the pixels to remain generally unaffected in appearance. The results show an image visually identical to the original. Unlike current methods, this steganography program has no restrictions on the file type or size. Furthermore, the PNG image format prevents pixel loss, allowing this program to be used on a larger scale to securely protect data in seemingly innocuous pictures.