Protection of images by combination of vernam stream cipher, AES, and LSB steganography in a video clip

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ABSTRACT

Visual communication has become more popular in recent years. Because data must be transferred safely over a restricted bandwidth, then techniques of data security and preservation such as masking and encryption have to be included after the optimization process for the image in question. The two most common methods of data protection are encryption and steganography. Steganography is a way for covering data that is hidden in another medium without leaving any proof of the data being changed, whereas cryptography converts regular data into incomprehensible data, which is known as scrambled data. Using the least significant bit (LSB) technique, the information was scrambled with graphics. The Vernam encryption algorithm and the advanced encryption standard (AES) will have a side in the proposed method in the encryption step. The three improvement proposals using quality standards and encryption will be compared with the Vernam encryption algorithm and the AES encryption algorithm. The effect of the improvement ratio and the size of the encrypted data with different threshold values will be investigated.

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1. INTRODUCTION

Advances in computer, telecommunications, and electronics have resulted in a broad perspective in the field of multimedia, which is continually developing in terms of features and technological advancements [1]. Every day, we have more multimedia tools and applications on the internet, in our homes, and elsewhere. For better results, our usual television (TV) broadcast crew has moved to the digital section. There are various issues associated with the rapid rise of multimedia [2], [3].

With the introduction of the compact disc and CD-ROM CDI in the 1990s and the availability of high-memory and low-cost computers, users were able to create rich programs that served the demands of researchers and others interested in applications, games, and education [4]. Video is being employed in a wide range of purposes, not simply for entertainment. Video conferencing, medical diagnostics, and security gadgets are more valuable everyday tools, but they require improvements in means and data protection [5], [6]. Today, reliance on digital media is not limited to the fields of games or education, but has evolved into a targeted media tool that has an impact on societies. As a result, it is necessary to raise awareness of its use in a way that serves the public interest and increases society's culture and awareness, while also maintaining the confidentiality of the transmitted information. Recently, programs and apps have become reliant on the integration and integration of two or more sensory media into an educational environment in order to deliver various knowledge and experiences. Illustrations, animation, maps, and other media can also be used [7].