

ABSTRACT

The convenience of exchanging data through telecommunications technology can harm data security. It is easy to commit cybercrimes like data hacking, exploitation, manipulation, and false ownership claims. Data security can be increased by using strong encryption. However, strong encryption is relatively costly, while information data usually does not contain completely sensitive information or only part of the data needs to be protected.

This research proposes multi-level security by blurring some of the data that contains sensitive but reversible content. As a result, this system differentiates receivers based on their authority. This research uses images as input data. The image to be used in this research is an image that contains a face as the sensitive data. Then, that area of the face is taken and blurred to make it a watermark. The blurring process starts by decomposing the face area with Singular Value Decomposition (SVD) and then encoding it with Compressive Sensing (CS). On the receiver, obfuscated data can be reconstructed by the authorized recipient.

The best results of PSNR, SSIM, and NC reconstructed images obtained by the system on the uncompressed method are 54.50 dB, 0.8813, and 0.9990. Meanwhile, PSNR, SSIM, and NC reconstructed images obtained by the system using the compression method are 53.07 dB, 0.8797, and 0.9985. The simulation with compression obtained an optimal result when compression ratio is 50.00%.

Keywords: Image Watermarking, Compressive Sensing, Reversible Data Blurring, multi-level data security.