National Institute of Technology Rourkela

Synopsis Seminar

Seminar Title	: On the Development of Secret Data Sharing through Coverless Video Steganography
Speaker	: Sourabh Debnath (Rollno : 519cs1014)
Supervisor	: Prof. Ramesh Kumar Mohapatra
Venue	: Convention Hall
Date and Time	: 06 Jan 2025 (11:00 am)
Abstract	: Steganography methods designate a cover image to embed secret information. Since the embedding process will modify the content of the cover image, more or less, modification traces will be left in the cover image. The coverless approach does not need to employ the designated cover image for embedding the secret data. The coverless technique has attracted more attention in the field of information hiding. At present, most coverless information-hiding schemes select text and images as transmission carriers. There are few studies on emerging popular media, such as video, which has more abundant content. Usually, the existing scheme hides confidential information based on single-frame features in the video. To develop efficient coverless video steganography four different schemes have been proposed. To utilize each frame, the first contribution explores the capacity and robustness of bit planes in coverless video steganography by generating multiple hash sequences from each frame. The second contribution aims at the robust LBP feature of video frames and the security of auxiliary information. LBP-based coverless video steganography on bit planes achieves better capacity on DAVIS2017 and UCF101 datasets. However, LBP-based didn't give the expected results on video compression attacks. The following contributions are in line with these findings. The third contribution explores the efficiency of Direct current (DC) coefficients on corresponding bit plane frames. To secure the auxiliary information, an ElGamal cryptosystem was deployed to strengthen the secret communication. All three datasets,viz., DAVIS2017, UCF101, and HMDB5l, have been used to validate the proposed schemes. The fourth contribution presents an ensemble model to generate multiple hash sequences per frame. Six pre-trained models are introduced: DenseNetl2l, MobileNetV2, VGG16, VGGl9, InceptionV3, and InceptionResNetV2 for mapping the frame features to the corresponding secret information segment. The experimental results show that the proposed technique achieves better robustness to various attacks, larger capacity, less time cost for extracting hash sequences, and a higher concealing success rate than existing coverless video steganography techniques.