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A PROJECT REPORT ON

**“AN IMPROVED DIFFERENCE-EXPANSION BASED
WATERMARKING SCHEME FOR GRAY-SCALE IMAGES”**

(Sponsored by KSCST)

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ABSTRACT

In this project, we propose **“An improved difference-expansion based watermarking scheme for gray-scale images”**. In this scheme, the difference value between the consecutive pair of pixels is used to embed the secret data using least-significant bit (LSB) substitution method. The range of difference values is adaptively divided into three categories namely s_1 , s_2 , s_3 . s_3 is further sub-divided into s_{31} , s_{32} , s_{33} . For any pair of consecutive pixels, both pixels are embedded with k -bit LSB substitution method. Here, the number of bits to be embedded i.e. k is decided by the category to which the difference value belongs to. In order to retain the category, to which the difference value belong to, before and after embedding, a readjustment phase is used. It is taken care that smooth areas are embedded with less number of bits and edge areas are embedded with more number of bits, so that the quality of the image is maintained and embedding capacity is improved.