

# Empirical Evaluation of Coding and Inter Pixel Redundancy in still Image Compression

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## Abstract

The main aim of this research work is to compress grayscale images efficiently using prediction and intensity-based image compression algorithms. Image compression is useful for removing the duplication in an image to store and transmit the data in an efficient form. This research work analyzes four new schemes for gray scale lossy image compression. Among the four schemes considered, two compressive approaches are designed for Prediction Based Image Compression (PBIC) level implementation. Third approach is designed for Intensity Based Image Compression (IBIC). Finally, the previously designed PBIC and IBIC schemes lead to an Integrated Encoder. All the considered method performances are analyzed using the performance metrics. These results are compared with JPEG 2000 which is a extensively used benchmark compression encoder. The outcome of all the proposed methods is also compared with modern encoders.

**Keywords:** Prediction based Image Compression, Intensity based Image compression, Intra Prediction, Modulus Transformation, Integrated Encoder, octagon based intra prediction, neighboring block, JPEG 2000

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## 1. Introduction

Visual information is of vital importance for mankind to perceive and understand the surrounding world. The saying “A picture is worth a thousand words” rightly expresses the amount of information contained in a single image. As the transmission and storage of every single bit in an image incurs a cost, the necessity of cost-effective image compression technique plays an important role. There are various compression methodologies that are designed in the last several decades. It starts with grayscale image, followed by color image and the research has its path in video compression (both grayscale and color). Predictive coding can be made superiorly with the help of the compression ratio. Some researchers describe prediction-based lossless compression [1–5]. The research work that was proposed

previously for grayscale image compression is analyzed in this paper.

The following research works are considered in this paper:

- An Octagon Based Intra Prediction (OBIP) scheme in PBIC method.
- N-Modulus Transformation (NMT) in PBIC method.
- IBIC – The impact of pixel values over compression is studied by dividing the image into high and low intensity values. Various existing compression methods are analyzed in this method.
- The Integrated Encoder.

The results of the above four methods are analyzed and compared with JPEG 2000 and recent encoders.













