بتول يحيى صادق
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Image compression based on chain code And RLE

Abstract

This report explores the application of the Freeman chain code and Run Length Encoding (RLE) algorithms as efficient methods for the storage and transmission of digital image data. Addressing the issue of redundant information inherent in digital images, arising from spatial and run-length redundancies, is the primary focus. The Freeman chain code algorithm provides a solution to the suboptimal representation of object boundaries by encoding them as a connected sequence of straight-line segments. By eschewing the direct storage of pixel coordinates and instead capturing movement between adjacent pixels, it effectively reduces spatial redundancy. Moreover, it affords a concise representation of object shapes, facilitating efficient storage and analysis. In tandem with the Freeman chain code, the RLE algorithm tackles spatial and runlength redundancies by compressing runs of identical pixel values into a single symbol and count. Particularly adept at handling binary images, RLE substantially diminishes storage requirements by efficiently representing consecutive runs. By amalgamating both algorithms, this report showcases a holistic approach to mitigating the issue of inefficient storage and transmission of digital image data. This integrated solution optimizes boundary representation, minimizes redundancy within image data, and streamlines data transfer and manipulation across diverse applications and platforms.