

# 图像压缩的小波变换算法研究与实现

# 摘 要

与文字相比图像拥有更明显的优势，可以将相关事物的特征等更加直观、形象地表现出来。但是图像本身的数据量较大，不利于对图像进行存储和传输，使其占用的空间和带宽更大，在一定程度上加大了通信的负担。在本文中，对图像处理技术在网络中的应用进行了相应分析。此时，对图像进行压缩处理就显得很有必要了。数字图像压缩技术是使用最少的数据信息表示原图像的一种信息处理技术。本文首先对如何选取最优小波基进行了讨论，在考虑到各方面的因素之后，选取了 Bior3.7 正交小波对图像进行分解，利用 `wavedec2` 函数对原始图像进行小波分解后，再用 `appcoef2` 函数对分解后的图像进行重构，最后利用 `wcodemat` 函数进行量化编码，得到压缩之后的图像。在不同的噪声的影响下，观察图像压缩的情况，基于 MATLAB 2016a 平台实现了利用小波变换对图像进行压缩，实验结果表明，小波变换在图像压缩方面具有良好的压缩效果。

**关键词：**图像压缩；小波变换；压缩比

## ABSTRACT

Compared with text, images have more obvious advantages, and can display the characteristics of related things more intuitively and visually. However, the amount of data in the image itself is large, which is not conducive to the storage and transmission of the image, which makes it occupy more space and bandwidth, and increases the communication burden to a certain extent. In this paper, the application of image processing technology in the network is analyzed accordingly. At this point, it is necessary to compress the image. Digital image compression technology is an information processing technique that uses the least amount of data information to represent the original image. In this paper, we first discuss how to choose the optimal wavelet base. After considering various factors, we select Bior3.7 orthogonal wavelet to decompose the image, use waveletdec2 function to wavelet decomposition the original image, and then use appcoef2 function. The decomposed image is reconstructed, and finally the quantization code is obtained by using the wcodemat function to obtain the compressed image. Under the influence of different noises, the image compression is observed. Based on the MATLAB 2016a platform, the image is compressed by wavelet transform. The experimental results show that the wavelet transform has good compression effect in image compression

**Keywords:** Image compression; Wavelet transform; Compression ratio

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