

Digital Image Processing Using MATLAB

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Abstract:

In this research , at first introduce initial contexts of image processing ,which we are needed to know before enter to main domain of image processing science.

And after it,discuss about image optimization and image processing methods in MATLAB software.

The name MATLAB stand for matrix laboratory. MATLAB is an interactive system whose basic data element is an array that does not require dimensioning. This allow formulating solutions to many technical computing problems,especially those involving matrix representations. In a fraction of the time it would take to write a program in a scalar non interactive language such as C or Fortran.

In university environment,MATLAB is the standard computational tool for introductory and advanced courses in mathematics,engineering and science. In industry, MATLAB is the computational tool of choice for research,development,and analysis.

Following areas:

Chapter 1:Introduction:

This chapter covers introduction and background on MATLAB and Image processing.

Chapter 2:fundamentals of Color Digital Image Processing:

This chapter covers initial contexts and fundamentals of MATLAB image processing toolbox and some things about image optimization.

Color models applicable to digital image processing discussed.

The chapter also covers applications of color to edge detection and region segmentation.

Chapter 3:Intensity Transformation and Spatial Filtering:

This chapter covers in detail how to use MATLAB and IPT to implement intensity transformation functions. linear and nonlinear spatial filters are covered and illustrated in detail.

Chapter 4:Processing in the Frequency Domain:

The material in this chapter shows how to use IPT function for computing the forward and inverse fast Fourier transformations(FFTs),how to visualize the Fourier spectrum,and how to implement filtering in a frequency domain filters from specified spatial filters.

Chapter 5:Image Restoration:

Traditional linear restoration methods,such as the Wiener filter,are covered in this chapter. Interactive,nonlinear methods,such as the Richardson-Lucy method and maximum –likelihood estimation for blind deconvolution,are discussed and illustrated. Geometric corrections and image registration also are covered.

Chapter 6:Image Compression:

The toolbox does not have any data compression function. In this chapter,we develop a set of function that can used for this purpose.

Chapter 7:Image Segmentation:

The set of IPT functions available for image segmentation are explained and illustrated in this chapter. New function for Hough transform processing and region growing also are developed.

Appendix: 1,2,3,4

References:

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