Design for an Image Processing Graphical User Interface

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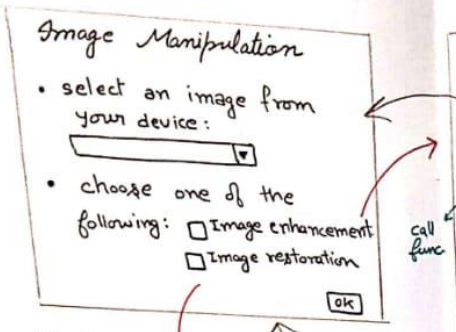
ABSTRACT

An image processing graphical user interface is designed based on MATLAB GUI. This interface has good interactivity and expansibility, which integrates multiple functional modules including basic function module, noise adding module. The graphical user interface can help students learning the basic theory and methods for digital image processing.

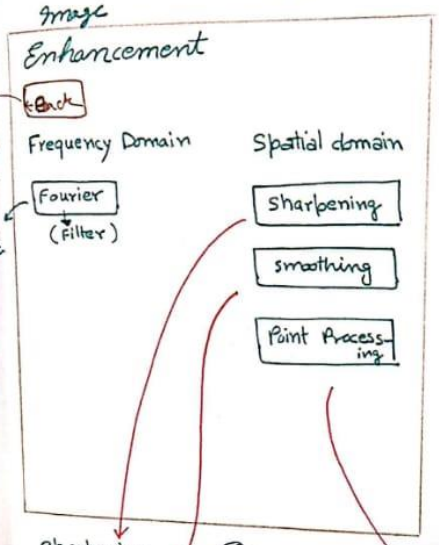
INTRODUCTION

MATLAB GUI (Graphical User Interface) provides a visual interactive platform, which can be used for settling code uniformly. It is relatively easy to get familiar with and requires little knowledge of programming. This paper constructs an image processing graphical user interface based on MATLAB GUI. The interface has five modules, which integrate basic function (image rotation, image brighten, graying processing, image zooming, and restoration), noise adding (impulse noise, Gaussian noise, and multiple noise), image denoising (median filter and linear filter). Basic design of project is displayed below.

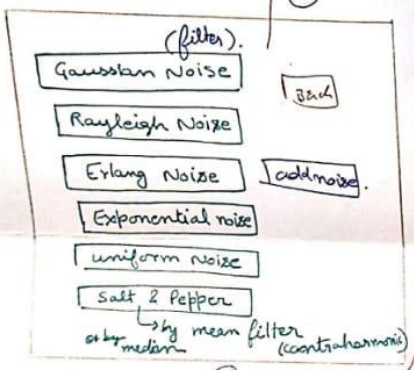
Dialog box 1 :



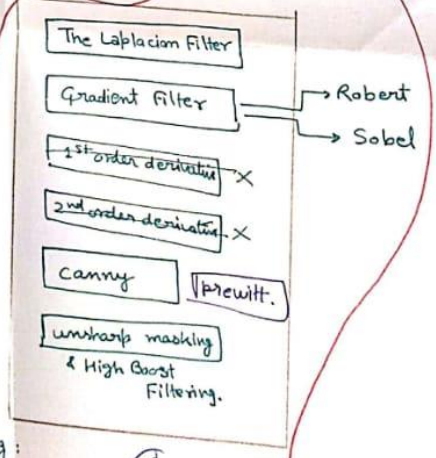
Enhancement : ②



Restoration ③



Sharpening : ④



Smoothing : ⑤

Point Processing : ⑥

Graphical User Interface Construction

MATLAB GUI is composed of the window, menu, icon, cursor, keys, dialog boxes, text and other graphical objects. It allows users to customize how to interact with MATLAB. This paper designs an image processing graphical user interface based on MATLAB GUI to realize the basic function in digital image processing.

The menu bar is composed of file, algorithms, and clear menu. Click the file menu, we can add the original image 1 and the original image 2, and save the image processing results. Click the algorithms menu, we can select the corresponding image processing function. Click the clear menu, the original image window and the processed image window can be restored. The toolbar offers the open, save and modification functions.

CONCLUSIONS

This paper presents the use of GUI tool for designing an image processing graphical user interface based on MATLAB. MATLAB provides an easy way to build GUI with elements such as radio buttons, check boxes, pushbuttons, list boxes etc., and link them to built-in MATLAB functions. We utilize these controls to integrate some basic image processing functions, such as, image rotation, image brighten, image graying, image zooming, noise adding, noise removal. The interface realizes good interactivity and expansibility.

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