

Patch-based Video Denoising with Optical Flow Estimation

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Abstract—Over the years a variety of methods have been introduced to remove noise from digital images, such as Gaussian filtering, anisotropic filtering, and Total Variation minimization. However, many of these algorithms remove the fine details and structure of the image in addition to the noise because of assumptions made about the frequency content of the image. The non-local means algorithm does not make these assumptions, but instead assumes that the image contains an extensive amount of redundancy. These redundancies can then be exploited to remove the noise in the image. This project will implement the non-local means algorithm and compare it to other denoising methods using the method noise measurement.

Keywords—Data Hiding; Digital Images; Optical Flow Estimation; Redundancy; Video Denoising.

Abbreviations—Data Encryption Standard (DES).

I. INTRODUCTION

ALL digital images contain some degree of noise. Often times this noise is introduced by the camera when a picture is taken. Image denoising algorithms attempt to remove this noise from the image. Ideally, the resulting denoised image will not contain any noise or added artifact. Major denoising methods include Gaussian filtering, Wiener filtering, and wavelet thresholding. Many more methods have been developed; however, most methods make assumptions about the image that can lead to blurring. This paper will explain these assumptions and present a new method, the non-local means algorithm that does not make the same assumptions. The non-local means method will then be compared to other denoising methods using several measurements on the output images. One of the measurements used will be the method noise, which is the difference between the image and denoised image [Solanki et al., 1; Kapotas et al., 2].

II. LITERATURE SURVEY

In this section, data hiding is the process of embedding information into a host medium. In bitstream level, the redundancies within the current compression standards are exploited. As a result, this type of data hiding methods is generally proposed for fragile applications, such as authentication. On the other hands, data level methods are most robust to attack. Therefore are suitable for a broader range of applications. The bitstream based methods are still attractive for data hiding applications. The quantization parameter and coefficient are altered in the bitstream –level. However the most of the video data hiding method utilize uncompressed video data. Propose a high volume transform domain data hiding in MPEG-2 videos. They apply QIM frequencies DCT coefficients and adapt the quantisation parameter based on MPEG-2 parameters. They vary the embedding rate depending on the type of this frame. As a result insertion and erasures are occur at the decoder, which causes desynchronization. They also handled by convolution codes as in embedded. It is mainly used for effective utilization of outsourced and encrypted cloud data under the aforementioned model, our system design should achieve the following security and performance guarantee [Sarkar et al., 3; Liu et al., 4].

III. SOFTWARE REQUIREMENTS AND WORKING PRINCIPLES

3.1. Block Diagram

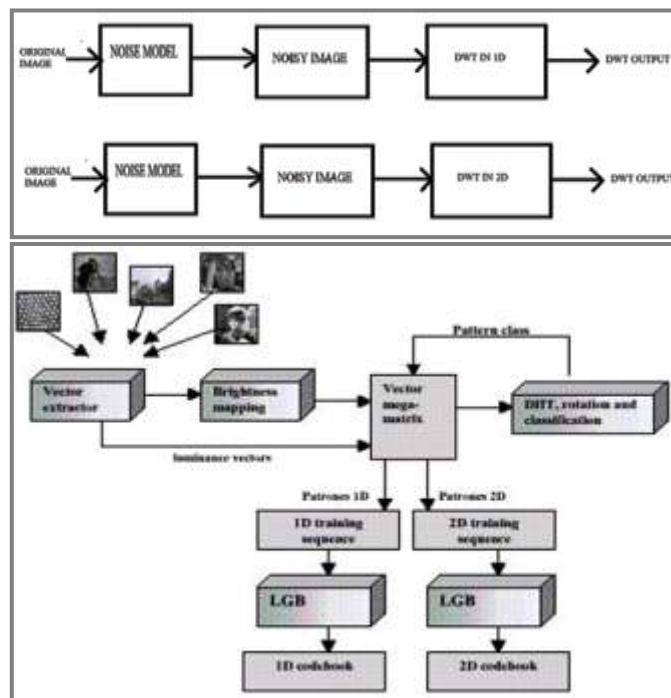


Figure 1: Block Diagram

3.2. Flow Diagram

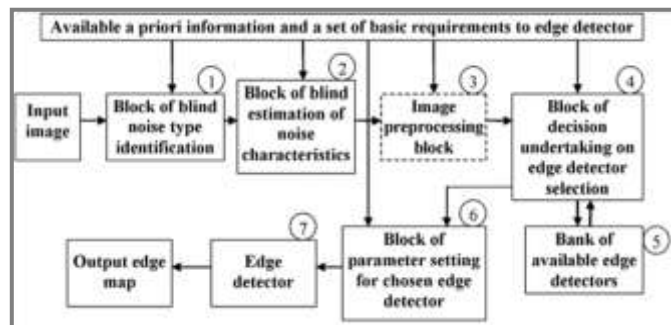


Figure 2: Flow Diagram

3.3. Working

3.3.1. Input Module

The input module is designed as such that the proposed system must be capable of handling any type of data formats, such as if user wishes to hide any images format then it must be compatible with all usual image formats such as jpg, gif, bmp, it must be also compatible with video format such as .avi, .flv, .wmf etc. And also it must be compatible with various document formats, so that the user can be able to user any formats to hide secret data [Donoho & Johnstone, 5; 8; 9].

3.3.2. Encryption Module

It consists of key file part, where key file can be specified with the password as a special security in it. The user can

type the data also through the browse button, when it is opened and where the user can select the secret message. button is clicked. Where the user can select the cover file and then the hidden button is clicked so that the secret data or message is hidden in cover file using Forbidden Zone Data Hiding Technique [Donoho, 6].

3.3.3. Decryption Module

This module is opposite as such as encryption module where the key file should be also specified same as message is displayed in the text area specified in the application or else it is extracted to the place where the user specifies it.

3.3.4. DES

This module consists of same as encryption and decryption part using DES algorithm. The data encryption standard (DES Z) is a block cipher that uses shared secret encryption.

3.3.5. Triple DES

It is consists of same as encryption and decryption part using Triple DES algorithm. Triple DES is the common name for the triple data encryption, book cipher, which applies the Data Encryption Standards cipher algorithm three times to each data block [Donoho et al., 7].

3.3.6. RSA

This module consists of same as encryption and decryption part using RSA algorithm. RSA is the first algorithm known to be suitable for signing as well as encryption, and was one of the first great advances in public key cryptography. RSA is widely used in electronic commerce protocols, and is believed to be sufficiently long key and the use of up-to-date implementations.

3.3.7. Module Input

We give the original content as input with watermark data embedding. We view flipping an edge pixel in binary images as shifting the edge location one pixel horizontally and vertically.

3.3.8. Module Output

The output of the project is we reconstruct the pixel horizontally and vertically. We can see the originally watermarked data and embedding content.

3.3.9. Input and Output

The major inputs and outputs are the major function of the system are follows:

1. User can upload any file and also encrypt the data.
2. User can download file with the help of password.

3.3.10. Performance Requirements

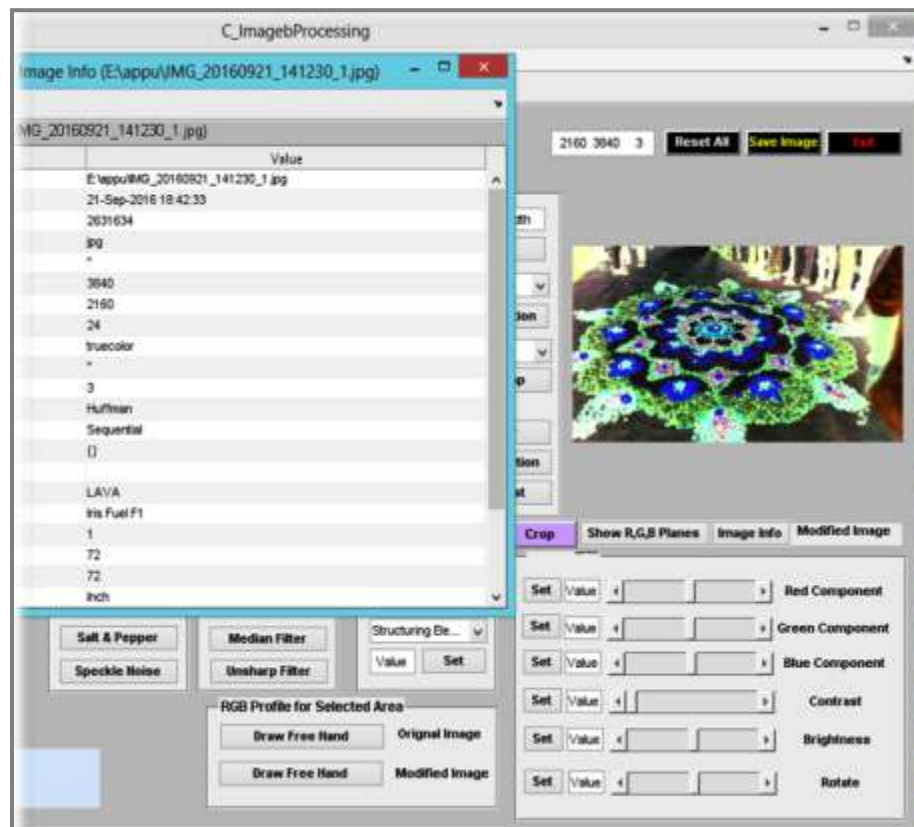
The performance is measured in terms of the output provided by the application [Simoncelli & Adelson, 10].

The requirements specification plays an important part in the analysis of a system. Only when the requirements specification are properly given, it is possible to design a

system, which will fit into required environment. It rests largely in the part of the users of the existing system to give the requirements because they are the people who finally use the system. This is because the requirements have to be known during the initial stages so that the system can be designed according to those requirements. It is very difficult to change the system once it has been designed and on the other hands designed system, which does not cater to the requirements of the user [Jansen, 13; Coifman & Donoho, 14].

3.3.11. Advantages

1. More noise is removed by these methods, but the true images were still blurry. Once again the methods noise contained details and structure from the images.
2. Hiding the data of video or images which is safe.
3. Susan filter performed better than the other two filter.



IV. SOFTWARE DESIGN

4.1. Matlab

These software packages are designed to improve the quality of a video sequences corrupted with Gaussian White noise [Chambolle et al., 11; Moulin & Liu, 12].

4.2. KEIL

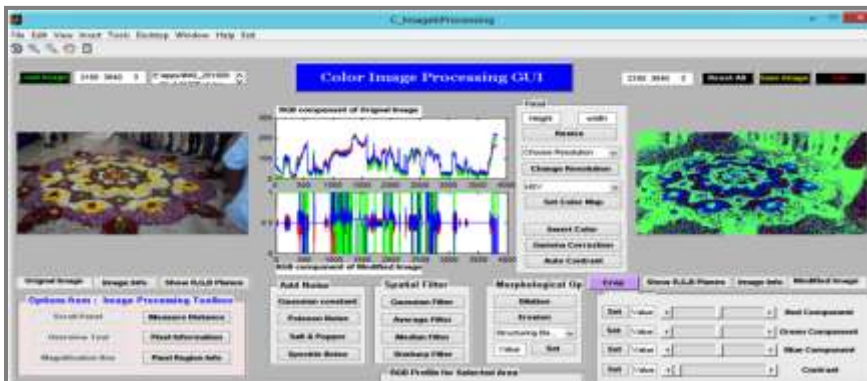
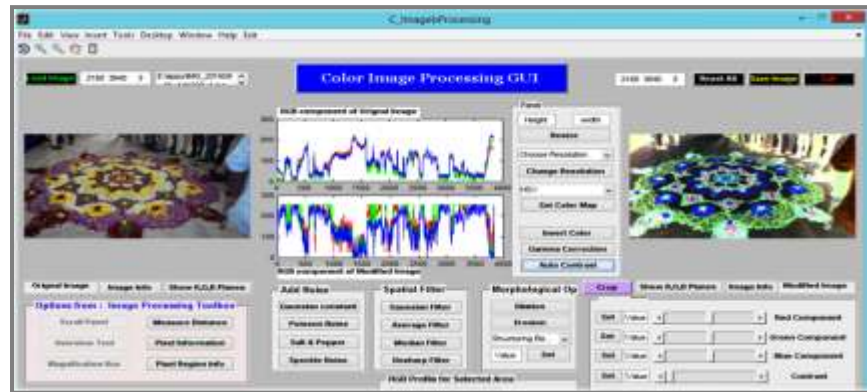
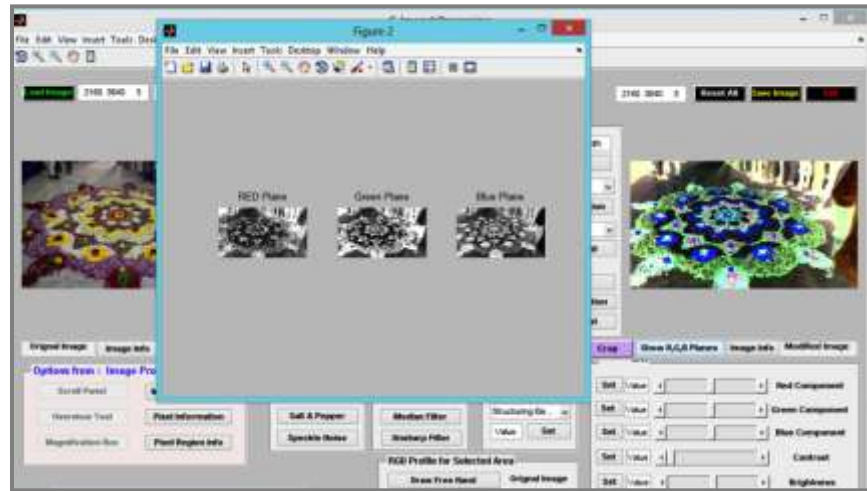
To dump the coding in matlab software.

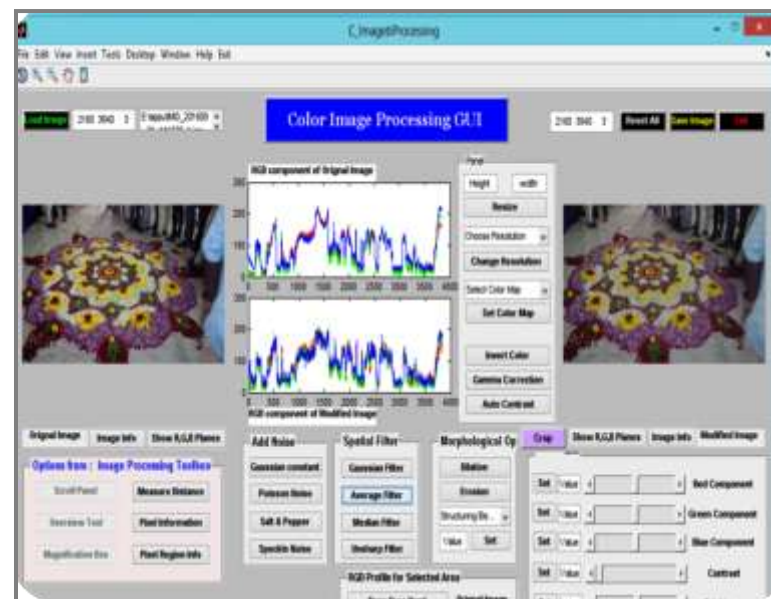
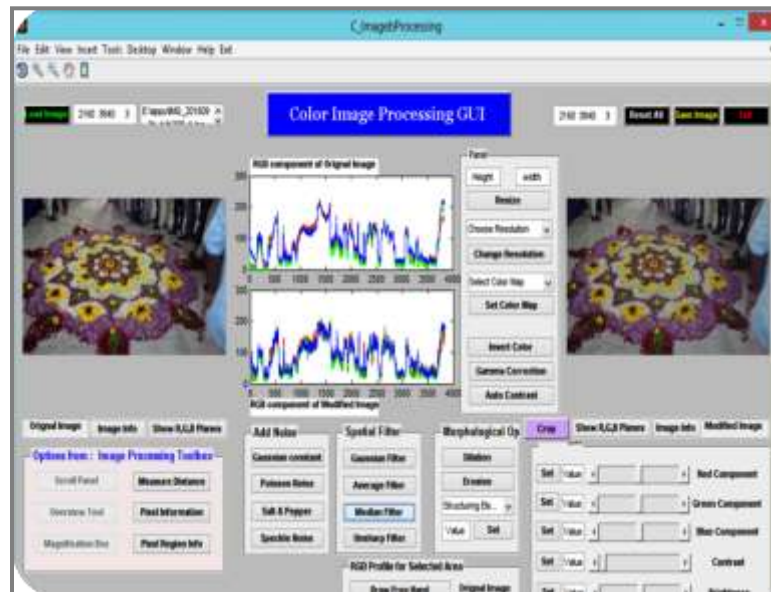
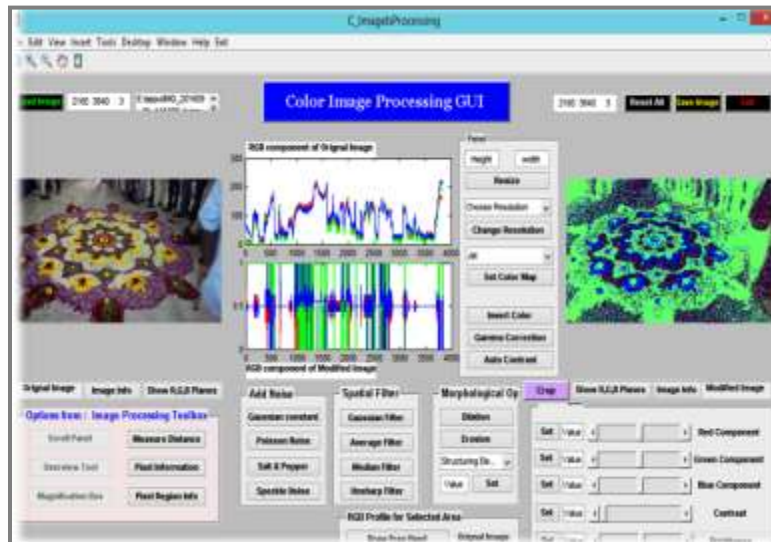
4.3. Microsoft Visual Basic

To view the original image from the noisy image by using denoising methods or filtering.

V. OUTPUT RESPONSE

- It is need for reliable digital image and video enhancement technologies to improve their outputs denoising algorithm
- That preserves large magnitude response while shrinking small magnitude response.





VI. CONCLUSION

In this paper, we propose a new video data hiding framework that makes use of erasure correction capability of RA codes and superiority of FZDH and QIM as the datahiding methods of the proposed framework. We observe that FZDH is superior to QIM, especially for low embedding distortion levels. The framework is tested with MPEG-2, H.264 compression, scaling and frame-rate conversion attacks. Typical system parameters reported for error-free decoding. The results indicate that the framework can be successfully utilized in video and data hiding applications.

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