

A FUZZY RULE BASED APPROACH FOR IMAGE ZOOMING IN SINGLE FRAME SUPER RESOLUTION

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Abstract- To developing a novel fuzzy rule-based prediction framework used for high quality image zooming. This is developed using patch-based image zooming technique that is Low Resolution (LR) patch are replaced by estimated High Resolution (HR) patch. Using fuzzy rule algorithm the LR input image reconstructed into high quality images.

Key words: Low Resolution (LR), High Resolution (HR), Patch, Fuzzy Zooming.

I. INTRODUCTION

Super-Resolution (SR) is to obtain a higher resolution image from the lower resolution images. High resolution image leads to high pixel density. The need for high resolution is mostly used in all the computer vision applications for the better performance in recognition the pattern and to analysis the images. Need of High resolution is major in medical imaging for the best result diagnosis. Most of the applications require the zooming for the image of a specific area in order to get the best resolution for the selected or the specific portion or region of the image outcome. The image used should be in high resolution becomes more essential, let us consider the example as e.g., forensic surveillance and satellite imaging applications. Mostly, high resolution images are not always be available. This high resolution imaging proves to be very expensive and also it cannot be always be feasible due to the inherent limitations of the following like sensor, optics manufacturing technology.

The major process of the Super-resolution is based on the idea of combining the low resolution or noisy sequence of images of a scene that can be used to generate a high resolution image or the image sequence. In order to reconstruct the original scene or portion of the image with the very high resolution for the given a set to observed the images at the lower resolution.

The Fuzzy image processing is not a unique theory. It is the collection of using the different fuzzy approaches to image processing. The Fuzzy image processing is the collection of all of the given approaches which, represent and process the images, and their segments and features as fuzzy sets. The processing and representation only depend on the how the fuzzy technique has selected for on the problem and how to solving.

II. ARCHITECTURE

The Fuzzy clustering method is the very oldest fuzzy approach to the image segmentation. For the cluster creation the Algorithms such as possibilistic c-means (PCM, Krishnapuram & Keller) and fuzzy c-means (FCM, Bezdek) can be used to build the clusters (segments). With an ideal object or a certain property the class membership of pixels can be interpreted as similarity or compatibility. If we interpret the image features as linguistic variables, then the fuzzy rule can be used if the image feature interpret as linguistic variable then if-then rules used to segment the image into the different regions. The simple fuzzy segmentation rule may contain as follows

The Fuzzy image processing has three main following stages: modification of membership values, image fuzzification and if necessary, image defuzzification is used.



Fig .1 Fuzzy Logic In Image Processing

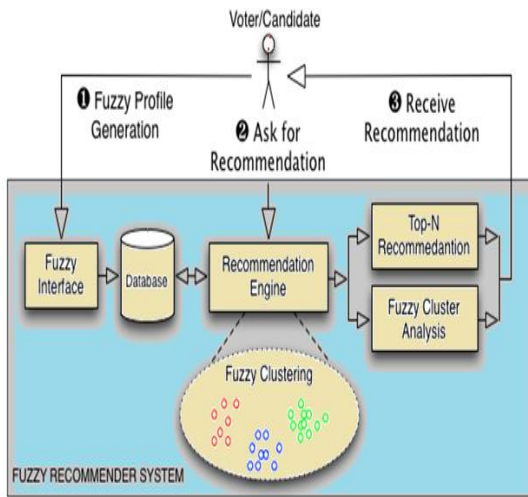


Fig.2 Architecture

III. RELATED WORKS

Super Resolution Image Reconstruction Through Bregman Iteration using Morphologic Regularization[18] in this paper the Non-linear regularization method based on multi scale morphology for the purpose of edge-preserving super resolution (SR) image reconstruction it is used and also the suppress inherent noise is generated during the low-resolution (LR) image formation as well as in the SR image estimation efficiently. The major drawback is that the Implementation process is more complex and time consuming process is omplex when it is compared with the others method.

A Fast Super-Resolution Reconstruction Algorithm for Pure Translational Motion and Common Space-Invariant Blur [4] in this method the recovering a super-resolved image from the set of decimated versions and warped blurred the new method is used .A new highly efficient super resolution algorithm is also developed in which the treatment separates into measurement fusion and de-blurring which preserves the optimality of the entire reconstruction process.

A Fuzzy Switching Filter for Enhancing Digital Images Corrupted by Impulse Noise [2]in this method the Fuzzy based median filtering technique is proposed for enhancing highly for corrupted digital images. And also for the Ttwo step process: in the following first step fuzzy decision rule is applied for the detection of the impulse noise on input image (noisy image) and in the second step, the noisy pixels are removed using the decision based filters.

IV. SYSTEM SPECIFICATION

In The Existing System The image up-sampling technique using for fuzzy sets. The new framework implemented to improve the effectiveness of traditional interpolation methods. Theywere the the original Euclidean distance in the interpolation formula replaced by an adaptive distance based on the local gradient information obtained by combining the fuzzy set theory with genetic learning algorithm. mostly the, method does not learn the direct LR-HR relationship from training database and it is just an improvement over the traditional interpolation based methods. The fuzzy rule based system for predicting the HR patches corresponding to each of LR patches of an input LR image. It has the following two phases (i) Offline phase: where to generate a rule based system, and to learn the corresponding parameters from a collection of LR-HR patch pairs and also (ii) Online phase: where to apply the trained rule based system on patches of a test LR image to generate its HR version. The following performance of the method is tested on different images and it is also compared with other zooming techniques.

V. EXPERIMENT ANALYSIS

For the development of an efficient fuzzy rule based system for predicting the HR image from an LR one, a large number of th training pairs of HR-LR patches are required. Where the color images are atually first converted from RGB to YCbCr format. Then only the Y channel is regarded as HR image in our image data-set and this is used for the further processing. Of the other two components, which contain the chromaticity information, where it can be ignored at this stage.

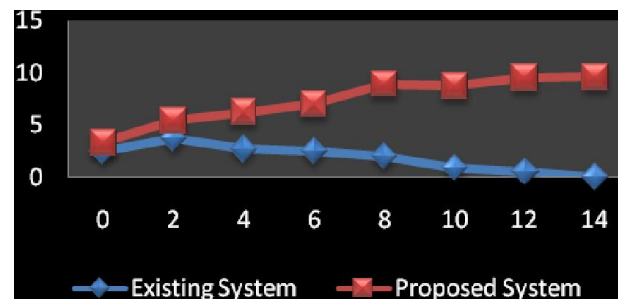


Fig 3. Comparison Of The Proposed Work With The Existing System

The original Euclidean distance in the interpolation formula is replaced by an adaptive distance based on the local gradient information obtained by the combining fuzzy set theory with the genetic learning algorithm. Mostly , their method does not learn the direct LR-HR relationship from the training database and this is just an improvement over traditional interpolation based methods.

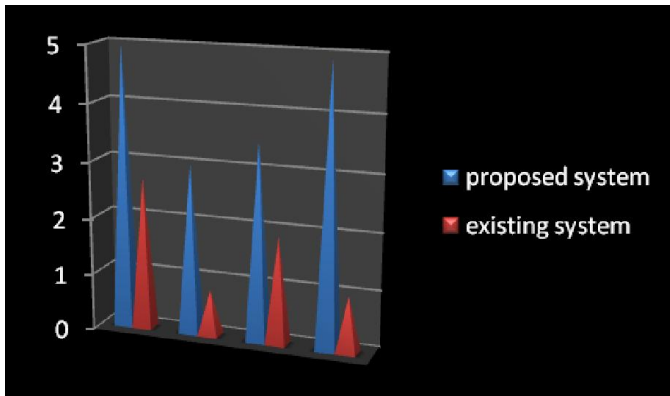


Fig 4 Comparison With The Resolution Of The Image

VI. CONCLUSION

Thus the project aims for the fuzzy rule based method gives the efficient mapping from LR patch space to the HR patch space and it can be formulated using super resolution method in the single frame. Where the experimental results show that the proposed method is much better than the competing methods and it is capable of reconstructing the thin lines, edges, fine details, and textures in the image efficiently. Modeling the prediction system using the nonlinear neuro-fuzzy framework where the parameters can be learned by using the neural networks which could also be the another direction of enhanced work.

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