

## A NEW FUZZY EDGE DETECTOR FOR NOISY IMAGES USING MODIFIED WFM FILTER

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**ABSTRACT.** *The edge detection is one of the most important tasks in the image processing area. The edges in the image can be defined as sudden gray level transition. In other words edges are the high frequency components of the images. At the same time, random noises have also same attributes. Thus distinguishing the edges from the noises is one of the most complex problems that is encountered in the image processing. In the literature some techniques and approaches are available for this purpose. In this paper we proposed a new fuzzy based approach to fulfill filtering and edge extraction simultaneously. It was proposed a new approach for filtering and edge detection using fuzzy approach. In these approaches, heuristic rules were applied, and results were observed for different images.*

**Keywords:** Edge extraction, Fuzzy mean filter, Fuzzy edge detector

1. **Introduction.** Edges characterize boundaries and are therefore a problem of fundamental importance in image processing. Edges in images are areas with strong intensity contrasts, a jump in intensity from one pixel to the next [1]. Edge detecting an image significantly reduces the amount of data and filters out useless information, while preserving the important structural properties in an image. Edge detection is a problem of fundamental importance in image analysis. In typical images, edges characterize object boundaries and are therefore useful for segmentation, registration, and identification of objects in a scene. On the other hands, random noises have same features as the edges. So distinguishing the edges from the noises is not easy process. In the literature reducing the noisy effects, some filtering approaches are used. Then the edge detection process is accomplished. There are some filtering and edge detection methods for this purpose.

Generally, reducing the effects of noises in the images is proposed before the edge detection task. But if the images have heavy probability impulse noises more than 0.25, classical filtering techniques are not sufficient to remove the noises such as mean and median filter [1]. The mentioned techniques are used to reduce effects of the noises that have less probability density. However in some conditions, the filtering process may take a long execution time such as high ordered median filter. On the other hand, there are many heuristic methods being used in the literature. These are called “fuzzy logic based