

## ABSTRACT

Now digital image become a very important matter and useful in our life necessity, so this digital imaging access has grown excessively. Often in digital image sending process, whether it through satellite or cable, will suffer an interference or external disturbance, which in this matter refers to noise insertion on sent digital image, as the result, it causes the received image quality become invalid and inappropriate if it's compared with the origin image

In this final task, a method based on approach to Mumford-Shah functional will be implemented and analyzed which can increase quality of image on both noise suffered and blur digital image. A blurring generated by Matlab. And noise used is additive Gaussian noise, impulsive noise, and additive laplacian noise where the noise in this image will be generated through a noise generator.

The parameter that will be tested on the digital image use with two way, which is objective and subjective. In objective parameter will be used SNR (Signal to Noise Ratio). In subjective will be used human observation. That perform will be compared with Tikhonov perform.

The Image result by using approach based on Mumford-Shah functional good for additive gaussian noise with variance  $\sigma^2$  between 0,12, image result filtering for impulsive noise is good for noise with probability  $p$  between 0,23, while at additive laplacian noise image result filtering is good for noise with value of laplace constant  $\lambda$  between 20.

Keywords : Restoration, Mumford-Shah functional, blur, noise, additive gaussian noise, additive laplacian noise, impulsive noise, SNR