

## FUZZY NEURAL NETWORK IN IMAGE PROCESSING

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### Abstract

Fuzzy Neural Network is widely used in the processing of the image with noise. The purpose of our work is to resolve the two problems, the universal approach and optimal learning algorithm for image processing. Our focus is Universal approximation algorithm of FNN and their learning. Universal approximation guarantees construction of Neural Network and some learning algorithms which are included Fuzzy weights. A FNN represents a digital image which is used for the construction of the image and noise filtering. Based on decision makings lukewarm nets with Fuzzy, some filters are used efficiently FNN to delete impulse noise and image restoration. What we get from this is to find the optimum filter of these two problems and its application in the images to remove the noise. We have expressed a two-dimensional digital image as a I/O (input / Output) to a Network Fuzzy decision makings. We create equivalence between a FNN and Fuzzy system. Two dimensional digital image can be treated by the use of nets with Fuzzy decision makings and can construct a filter efficient FNN. In the end the media filter is better than other types of filters. From used algorithms we built a new filter FNN which is more stable and better than an ordinary filter FNN. The optimal filter is constructed from the design of learning algorithm from selection FNN type and decision making FNN type. The best FNN is the model that has MAE (minimization of absolute error) lower from the output filter, so FNN optimal filter acquired by minimizing the MAE. When the image is interrupted by the high probability of noise (p 50%) as is the performance of the filter, the new filter type FNN is much better. When the probability of noise is 0, the image can be reconstructed completely from new FNN filter. The program used for the simulation of images is MATLAB.

**Keywords:** *Fuzzy Neural Networks, image processing, filter, training.*