Abstract

In this paper, we develop a multilayered genetic based fuzzy image filter, which consists of fuzzy number construction process, a fuzzy filtering process, a genetic learning process and an image knowledge base. The introduction of multilayered fuzzy systems substantially decreases the number of rules to be learnt. First, the fuzzy number construction process receives noise free image and sample images and then constructs an image knowledge base for the fuzzy filtering process. Second, the fuzzy filtering process contains a parallel fuzzy inference system, a fuzzy mean process, and a fuzzy decision process to perform the task of removing impulse noise. Finally, based on the genetic algorithm, the genetic learning process adjust the parameters of image knowledge base. Based on the criteria of Peak Signal to Noise Ratio (PSNR), Mean Square Error (MSE) and Mean Absolute Error (MAE), Genetic based fuzzy image filter achieves a better performance.

Reference


**Index Terms**

Computer Science \hspace{1cm} Fuzzy Systems

**Key words**

Parallel fuzzy inference system \hspace{1cm} fuzzy number

genetic algorithm

impulse noise

tuning

Math Lab Tool