Hyperspectral Image Noise Elimination by Adaptive Fuzzy Systems

In this Paper, mixed noise removal algorithm for hyperspectral imagery (HSI). Most primitive noise removal approaches used neighbour pixel values to replacement of noisy pixels. But these approaches affected on the all HSI layer pixels of mixed noisy and noiseless pixels. So the HSI images lost vital texture parts such as edges. The hyperspectral data is taken as multiple layers that is able to jointly treat both the spatial and spectral modes. This entire denoising process is based on the Fuzzy Clustering based denoising algorithm. Our work involved in minimization model to remove mixed noise such as impulse noise, Gaussian to Gaussian mixture, and Gaussian-impulse noise from the HSI data. This paper expressed efficient method, containing two levels, which in the first level, Noisy pixels detect based on an Adaptive Neuro-Fuzzy Inference System (ANFIS), then in the final level, the new modifications apply on these pixels. To analyse the proposed method, some experiments have been done on several standard hyperspectral images, also based on different metrics and they were compared with popular methods. The results from experiments reveals that the proposed method relatively has the expected performance.