

Combination Approaches in Neural Classifiers Fusion for Image Classification

K.-S. Chen

National Central University, Taiwan

Y.-C. Tzeng

National United University, Taiwan

In this paper, three different weighting policies: variance reduction technique, rms distance weighting, and average distance weighting, in the use of multiple neural classifiers for image fusion are investigated and compared. The fusion procedures are categorized by their input/output characteristics in five categories: data in data out, data in feature out, feature in feature out, feature in decision out, decision in decision out. It is seen that data fusion are held at different levels and is divided into three levels: raw data level fusion, feature level fusion, and decision level fusion. In this paper, we take the decision level fusion. The performance of each method of combination is evaluated with fusion of multi-polarization SAR and optical images. As for classifier, a single neural network was used to classify both SAR and optical images, although different types of classifier may be used to different data sources. Experimental results show that the classification accuracy is dramatically improved by the proposed method. For weighting method that combines the pre-classification results, it indicates that the rms distance weighting and the average distance weighting perform comparatively and both outperform that of using the variance reduction technique.