World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Remote Assessment and Change Detection of GreenLAI of Cotton Crop Using Different Vegetation Indices

Authors : Ganesh B. Shinde, Vijaya B. Musande

Abstract : Cotton crop identification based on the timely information has significant advantage to the different implications of food, economic and environment. Due to the significant advantages, the accurate detection of cotton crop regions using supervised learning procedure is challenging problem in remote sensing. Here, classifiers on the direct image are played a major role but the results are not much satisfactorily. In order to further improve the effectiveness, variety of vegetation indices are proposed in the literature. But, recently, the major challenge is to find the better vegetation indices for the cotton crop identification through the proposed methodology. Accordingly, fuzzy c-means clustering is combined with neural network algorithm, trained by Levenberg-Marquardt for cotton crop classification. To experiment the proposed method, five LISS-III satellite images was taken and the experimentation was done with six vegetation indices such as Simple Ratio, Normalized Difference Vegetation Index, Enhanced Vegetation Index, Green Atmospherically Resistant Vegetation Index, Wide-Dynamic Range Vegetation Index, Green Chlorophyll Index. Along with these indices, Green Leaf Area Index is also considered for investigation. From the research outcome, Green Atmospherically Resistant Vegetation Index outperformed with all other indices by reaching the average accuracy value of 95.21%.

Keywords : Fuzzy C-Means clustering (FCM), neural network, Levenberg-Marquardt (LM) algorithm, vegetation indices
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020