

Hedgerow Detection and Characterization Using Very High Spatial Resolution SAR DATA

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Abstract : Hedgerow has an important role for a wide range of ecological habitats, landscape, agriculture management, carbon sequestration, wood production. Hedgerow detection accurately using satellite imagery is a challenging problem in remote sensing techniques, because in the special approach it is very similar to line object like a road, from a spectral viewpoint, a hedge is very similar to a forest. Remote sensors with very high spatial resolution (VHR) recently enable the automatic detection of hedges by the acquisition of images with enough spectral and spatial resolution. Indeed, recently VHR remote sensing data provided the opportunity to detect the hedgerow as line feature but still remain difficulties in monitoring the characterization in landscape scale. In this research is used the TerraSAR-x Spotlight and Staring mode with 3-5 m resolution in wet and dry season in the test site of Fermoy County, Ireland to detect the hedgerow by acquisition time of 2014-2015. Both dual polarization of Spotlight data in HH/VV is using for detection of hedgerow. The varied method of SAR image technique with try and error way by integration of classification algorithm like texture analysis, support vector machine, k-means and random forest are using to detect hedgerow and its characterization. We are applying the Shannon entropy (ShE) and backscattering analysis in single and double bounce in polarimetric analysis for processing the object-oriented classification and finally extracting the hedgerow network. The result still is in progress and need to apply the other method as well to find the best method in study area. Finally, this research is under way to ahead to get the best result and here just present the preliminary work that polarimetric image of TSX potentially can detect the hedgerow.

Keywords : TerraSAR-X, hedgerow detection, high resolution SAR image, dual polarization, polarimetric analysis

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