



Application of the Dempster-Shafer Theory to the Classification of Pixels from Aster Satellite Images and Spectral Indices

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Résumé en anglais In this paper, it is proposed to apply the Dempster-Shafer Theory (DST) or the theory of evidence to map vegetation, aquatic and mineral surfaces with a view to detecting potential areas of observation of outcrops of geological formations (rocks, breastplates, regolith, etc.). The proposed approach consists in aggregating information by using the DST. From pretreated Aster satellite images (geo-referencing, geometric correction and resampling at 15 m), newchannels were produced by determining the spectral indices NDVI, MNDWI and NDBaI. Then, the DST formalism was modeled and generated under the MATLAB software, an image segmented into six classes including three absolute classes (E,V,M) and three classes of confusion ($\{E,V\}$, $\{M,V\}$, $\{E,M\}$). The control on the land, based on geographic coordinates of pixels of different classes on said image, has made it possible to make a concordant interpretation thereof. Our contribution lies in taking into account imperfections (inaccuracies and uncertainties) related to source information by using mass functions based on a simple support model (two focal elements: the discernment framework and the potential set of belonging of the pixel to be classified) with a normal law for the good management of these.

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