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Water Detection in Aerial Images Using Fuzzy Sets

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Abstract : This paper presents a methodology to pixel recognition in aerial images using fuzzy c-means algorithm. This algorithm is a alternative to recognize areas considering uncertainties and inaccuracies. Traditional clustering technics are used in recognizing of multispectral images of earth's surface. This technics recognize well-defined borders that can be easily discretized. However, in the real world there are many areas with uncertainties and inaccuracies which can be mapped by clustering algorithms that use fuzzy sets. The methodology presents in this work is applied to multispectral images obtained from Landsat-5/TM satellite. The pixels are joined using the c-means algorithm. After, a classification process identify the types of surface according the patterns obtained from spectral response of image surface. The classes considered are, exposed soil, moist soil, vegetation, turbid water and clean water. The results obtained shows that the fuzzy clustering identify the real type of the earth's surface.

Keywords : aerial images, fuzzy clustering, image processing, pattern recognition
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