



Towards interpretation of two-dimension geophysical data using methods of fuzzy logics and morphology analysis

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Very frequently two-dimension geological and geophysical information (maps for example) is examined from an expert point of view. The aim of such examination could be to delineate 2-D clusters or 1-D objects (boundaries for example) or to mark out some special points. Rather frequently such an analysis is aggravated by a large volume of data needed to be examined. Besides, during a prolonged visual expert examination it is difficult to ensure the strictly identical approach in an examination of the whole set of data. Automatic algorithms that could imitate the visual expert examination of 1-D and 2-D data sets in a strictly identical manner are needed. The alternative to expert visual data examination meeting these demands and based upon fuzzy-logic (FL) and morphology analysis (MA) is presented. Computational complexity is not a limitation any more because the computing power of computers has been significantly improved to meet such applications. The elaborated algorithms were tested at model examples and applied to real data examination. The approach was shown to be efficient in analysis of potential fields (gravity and magnetic data). Among others applications the approach was applied to interpretation of data of local detailed geophysical prospecting. In these cases Euler solutions clustering was carried out and a new insight into the local geological structure was obtained in result. The used algorithms and results obtained are briefly discussed. The obtained results make FL and MA examination an important perspective alternative to the conventional expert visual method of examination of different geophysical data sets. These methods can be applied also in other fields where the similar problems arise.