

عنوان مقاله:

Anisotropic Inverse Distance Weighting Method: An Innovative Technique for Resource Modeling of Vein-type Deposits

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خلاصه مقاله:

Geological modeling is an important step for the evaluation of natural resources. One option is to use a common geo-statistical modeling method such as Indicator Kriging (IK). However, there are specific problems associated with IK, the worthiest of attention is an order relation violation. Alternatively, some studies propose to use the Inverse Distance Weighting (IDW) method. Though again, there are certain limitations associated with the IDW geo-domain modeling application. In fact, the current IDW methodology does not cover the subject of anisotropic geo-domain modeling; thus it is only applicable for the isotropic cases. Therefore, this work proposes a previously unused geo-domain modeling-Anisotropic IDW, which underlies the concept of indicator variogram, allowing one to consider the spatial correlation of the domains. The experimental part in this work includes the comparison of anisotropic IDW, IK, and traditional IDW over the synthetic case study, which imitates a highly anisotropic geological behavior, and a more complicated real case study over a vein-type gold deposit from Kazakhstan. The case studies' results illustrate that the anisotropic IDW can model the geo-domains more accurately than IK and the traditional IDW.

کلمات کلیدی:

Anisotropic Inverse Distance Weighting, IDW, Categorical Variable, Geological modeling, Implicit Geomodelling

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