عنوان مقاله:

Multi-Output Adaptive Neuro-Fuzzy Inference System for Prediction of Dissolved Metal Levels in Acid Rock Drainage: a Case Study

محل انتشار:

مجله هوش مصنوعی و داده کاوی, دوره 6, شماره 1 (سال: 1397)

تعداد صفحات اصل مقاله: 12

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خلاصه مقاله:

Pyrite oxidation, Acid Rock Drainage (ARD) generation, and associated release and transport of toxic metals are a major environmental concern for the mining industry. Estimation of the metal loading in ARD is a major task in developing an appropriate remediation strategy. In this study, an expert system, the Multi-Output Adaptive Neuro-Fuzzy Inference System (MANFIS), was used for estimation of metal concentrations in the Shur River, resulting from ARD at the Sarcheshmeh porphyry copper deposit, southeast Iran. Concentrations of Cu, Fe, Mn and Zn are predicted using pH, sulphate (SO4) and magnesium (Mg) concentrations in the Shur River as input to the MANFIS. Three MANFIS models were implemented, Grid Partitioning (GP), the Subtractive Clustering Method (SCM) and the Fuzzy C-Means Clustering Method (FCM).A comparison was made between these three models and the results show the superiority of the MANFIS-SCM model. The results obtained indicate that the MANFIS-SCM model has .potentialfor estimation of the metals with high a degree of accuracy and robustness

کلمات کلیدی:

Acid rock drainage, MANFIS, Grid partitioning, Subtractive clustering method, Fuzzy C-means clustering method