



Soft computing modeling for indirect determination of the weathering degrees of a granitic rock

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Determination of weathering degrees of intact rock has been one of the difficult problems in engineering geology. Additionally, granitic rocks are commonly used as building and ornamental stones and pavement material in various civil engineering structures. For this reason, correct determination of weathering degree of the granitic rocks has a crucial importance in engineering geology. Up to now, some approaches for the determination of weathering degree of granitic rocks have been proposed. Some soft computing methods have been used for the determination of the weathering degree of the granitic rocks. However, in literature, the adaptive neuro-fuzzy inference system has not been used for the weathering classification yet. For this reason, the main purpose of the present study is to apply some soft computing methods such as artificial neural networks and adaptive neuro-fuzzy inference system on the determination of weathering degree of a granitic rock selected from Turkey by using some index and mechanical properties. The study is formed by four main stages such as sampling, testing, modeling and assessment of the model performances. During the modeling stage, two weathering prediction models with multi-inputs are developed with two soft computing techniques such as artificial neural networks and the adaptive neuro-fuzzy inference system. The general performances of models developed in this study are close; however the adaptive neuro-fuzzy inference system exhibits the best performance considering the performance index and the degree of consistency. Finally, both models developed in this present study can be used when determining the weathering degree. The results obtained from this study revealed that the soft computing techniques used in the study are highly useful tools to solve some complex problems encountered frequently in engineering geology.