

Application of Artificial Neural Network in Assessing Fill Slope Stability

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Abstract : This paper details the utilization of artificial intelligence (AI) in the field of slope stability whereby quick and convenient solutions can be obtained using the developed tool. The AI tool used in this study is the artificial neural network (ANN), while the slope stability analysis methods are the finite element limit analysis methods. The developed tool allows for the prompt prediction of the safety factors of fill slopes and their corresponding probability of failure (depending on the degree of variation of the soil parameters), which can give the practicing engineer a reasonable basis in their decision making. In fact, the successful use of the Extreme Learning Machine (ELM) algorithm shows that slope stability analysis is no longer confined to the conventional methods of modeling, which at times may be tedious and repetitive during the preliminary design stage where the focus is more on cost saving options rather than detailed design. Therefore, similar ANN-based tools can be further developed to assist engineers in this aspect.

Keywords : landslide, limit analysis, artificial neural network, soil properties

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