

Future Prospect of Artificial intelligence (AI) in Sustainable Geostructure

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The determination of risk is a key task for sustainability of geostructure. In this paper, various application of AI techniques will be discussed in geotechnics such as energy pile, retaining wall, liquefaction, etc. The concept of working procedures of human brain is used to develop AI. In AI, dataset is required to develop the model. The performance of AI depends on the quality & quantity of dataset. AI acquire knowledge from data for any physical phenomena. Hence, no assumption is required for the development of AI. The procedure for determination of reliability index and probability of failure will be discussed in detail. First Order Second Moment (FOSM), Secondary Order Reliability Method (SORM), Monte Carlo Simulation (MCS) will be adopted for probabilistic design. Reliability index and probability of failure will be determined based on FOSM, SORM, MCS and developed AI models. Various AI models {Support Vector Machine (SVM); Relevance Vector Machine (RVM); Multivariate Adaptive Regression Spline (MARS); Emotional Neural Network (ENN); Genetic Programming (GP); Logistic Regression (LR); Convolution Neural Network (CNN)} will be discussed in geotechnical engineering application. The obtained probability of failure will be useful for optimum performance of geo structure. A sensitivity analysis will be performed to determine the effect of various parameters on probability of failure of various geo-structure.