

Application of Artificial Neural Networks & Support Vector Machines in Dynamic Analysis of Structure & Soil Interaction

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Abstract

Soil structure interaction, especially in recent decades, has been of important issues and concerns of engineers. Many efforts for considering the effects of soil structure interaction on dynamic characteristic of structures have been achieved. But mainly these efforts is not achieved to the procedures used by the engineers of the public. But, in recent decades new methods for solving difficult engineering problems are presented that directly to data and laboratory or experimental information. Aim of this thesis is the investigation of the application two methods of these important group methods called artificial neural network and Support Vector Machine. In this thesis will show that there is seriously and fundamental hope on using statistical methods in solving engineering problems. Results show that performing multiple tests, although costly and time consuming in order to find relationships between data with the statistical methods is valuable. In continuance, by using experimental and laboratory results, eight different models optimized for simulated four basic variables, designed and offered. Although the results of four models is evaluated very good, but the reasons for inappropriate results are presented in four models.

Key Words

Artificial Neural Networks, Support Vector Machines, Finite Elements, Soil Structure Interaction