

Article Abstract

Title:	Effect of training algorithms on neural networks aided pavement diagnosis
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Abstract:	Routine pavement maintenance necessitates present structural diagnosis and condition evaluation of pavements by employing non-destructive test equipment such as the Falling Weight Deflectometer (FWD). FWD testing of pavements involves measuring time-domain surface deflections resulting from applied impulse loading on the pavement. Through inverse analysis of FWD deflection data, the stiffness parameters of the individual pavement layers are, in general, determined using iterative optimization routines. In recent years, Neural Networks (NN) aided inverse analysis has emerged as a successful alternative for predicting pavement layer moduli from FWD deflection data in real-time. Especially, the use of Finite Element (FE) based pavement modeling results for training the NN aided inverse analysis is considered to be accurate in realistically characterizing the non-linear stress-sensitive response of underlying pavement layers in real-time. Efficient NN learning algorithms have been developed and proposed to determine the weights of the network, according to the data of the computational task to be performed. In this paper, the effect of training algorithms on the NN aided inversion process is analyzed and discussed.
Keywords:	Neural networks; Non-destructive testing; Inverse analysis; Finite element; Flexible pavement