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## USE OF NEURAL NETWORKS FOR PAVEMENT CONDITION RATING

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#### ABSTRACT

This paper discusses the use of Artificial Neural Networks (ANN) for pavement condition rating. The paper examined two different ANN algorithms, Radial Basis Function Neural Network (RBFNN) and Multi-layer Perceptron Back-propagation Neural Network (MLPBPNN) for the purpose of modelling pavement condition rating. A case study using pavement inspection data on Lagos-Ibadan Express Road is presented. The current method for pavement condition rating involves combining density and severity levels of distress types into a convenient scale. Pavement condition rating was implemented using SPSS software which selects automatically the best neural network architecture. Both neural networks were implemented using similar dataset for training, testing and validation. In general, comparing the performance of the two neural network models, the MLPBPNN gives a better performance than RBFNN in terms of relative error and coefficient of determination ( $R^2$ ). The result of the weight matrix obtained from the training process can be stored in an easy-to-read text file, which can be used to develop software to rate the future pavement condition. This facilitates convenient updating of the MLPBPNN model by simply updating the text that stores the weight matrix.

**Key words:** Artificial Neural Network, Radial Basis Function, Back-propagation, pavement condition rating, Pavement Distress