類神經網路預測高層建築物干擾效應之應用

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摘要

　　都會區中鄰近高層建築物之間的干擾效應是極為複雜的問題,影響干擾效應的變數很多,如:建築物的間距、周邊地形、主建築物與鄰近建築物的造型等。為了探討各項參數的影響,傳統上需針對各參數進行風洞實驗,推導經驗式。由於影響參數過多,其過程極為費時困難。本文利用有限的干擾效應風洞試驗資料庫建立類神經網路模式,進而對於不同條件下高層建築干擾效應進行預測;並根據類神經網路預測得到之干擾效應計算高層建築物的設計風載重,得到尚稱可接受的結果。研究過程中,亦對現有資料庫的缺失及其改善方向得到進一步的認知。

關鍵字: 高層建築、干擾效應、設計風載重、類神經網路

Application of Artificial Neural Network on the Predication of Building Interference Effects

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ABSTRACT

　　The interference phenomenon between two adjacent tall buildings involves many parameters. It is too complicated a problem to adopt the conventional engineering approach, i.e., acquiring sufficient aerodynamic database and then deriving a set of general purpose empirical formulae. This paper applies the Artificial Neural Network technique on an existing limited aerodynamic database to predict tall buildings' interference effects. The results indicate that the back propagation ANN model can predict tall buildings' interference effects up to a reasonable margin of error, at least for the initial building design stage. During the progress of this research, the weak spots of the current aerodynamic database and the future amendment were identified.

Keywords: tall building, interference effect, design wind load, neural network.