

BUILDING HVAC SYSTEMS ECONOMIC PERFORMANCE EVALUATION USING NEURAL NETWORK METHOD AT BEGINNING OF DESIGN

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ABSTRACT

Two aspects need to be done to assess the performance of building Heating Ventilation and Air Conditioning (HVAC) systems. One is to evaluate the extent to which an HVAC scheme satisfies the air conditioning requirement. The other is to evaluate the economic characteristics of several HVAC schemes, all of which can satisfy the air conditioning demand. It is difficult to evaluate the economic performance of HVAC systems because economic evaluation involves some factors that frequently change and often unknown such as equipment price, especially at the beginning of the design stage. Furthermore, there is a conflict between the situation of knowing few information of HVAC system and the demand of detailed information to evaluate economic characteristics at design beginning stage. Neural network method can solve these problems for its self-adaptive ability and convenient multi-variable input-output function. ADLINE neural network model is analyzed and used to evaluate the economic characteristics of HVAC systems. The compare between the value predicted by ADLINE and the value calculated in detail shows that the relative error is less than 6% and the economic performance evaluation using ADLINE neural network model can satisfy the demand of actual HVAC project design.

KEYWORDS

Building HVAC Systems, Economic Performance, Evaluation, Prediction, Neural Network Method, ADLINE