

IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Specialized Technologies, Including Nanotechnology (8)

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DEVELOPMENT OF A NEURAL NETWORK FOR SOLVING DESIGN AND STRUCTURAL
PROBLEMS**Abstract**

Nowadays, the interest in neural networks has grown considerably, because of their capacity to solve complex problems in a short amount of time. The present paper provides an overview of the state-of-art of this emanating field, including a step-by-step for creating a DFF (Deep Feed Forward) neural network. Including some engineer applications in design and mechanical material properties, focusing on the aerospace sector. The main objective of this new technology is to help computers to make intelligent decisions with limited human assistance. This is due to the fact that they can learn and model relationships between input and output data that are non-linear and complex. A Deep Feed Forward network is as its name implies a feed-forward that uses more than one hidden layer, this allows us to remove the overfitting and improve the generalization. This type of neural network is viable for data compression, pattern recognition, financial prediction, and computer vision, it can be applied to continuous and discontinued problems. DFF is also known as MLP, and it is structured by two principal layers, the input layer, and the out layer, the hidden layers are the ones in between the first and the second one. Neural networks work with the help of neurons, simulating a human brain, which is capable of processing information and bringing solutions with different methods. This handbook is intended to provide the reader with all the necessary information to develop a DFF-type neural network, without the necessity of having extended knowledge about the subject, and bring some real applications in the field of materials and CAD design.