## Appendix-I

**PAPERS PUBLISHED**

<table>
<thead>
<tr>
<th>No.</th>
<th>Authors</th>
<th>Title</th>
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In 1995, Mukherjee and Deshpande [49A] clearly stated that it is very difficult to use any procedural programming language for computerization of structural design process because it requires a lot of knowledge, use of past experience, rules of thumb and intuition. Even the Rule Based Expert Systems (RBES) lack the learning capability for a structural design application. It is unable to generalize the situation on its own to apply the given knowledge to an entirely new situation and it fails to incorporate the intuition. Looking at these shortcomings of procedural programming language and rule based expert systems they investigated the suitability of an Artificial Neural Network (ANN) for the initial design of structures. As the ANNs can learn through designs created by experts in the form of various parameters, they are able to capture the expert’s knowledge, intuition and past experience in a generalized form. After a brief discussion of ANN, they developed a multilayer feed forward network for a problem of initial design of rectangular concrete beam by training the network using the examples generated by the optimization algorithm. The back propagation learning algorithm was used to train the network considering 8 nodes in input layer, 5 nodes in output layer and 30 nodes each in two hidden layers. A comparative study of the results obtained by the optimizer and the trained network was presented with detailed discussion on various stages of development and performance evaluation of the network. In many cases the prediction of the network was found in good agreement with the values obtained by the optimizer for a single span concrete beam problem.