Efficiency based training method to neural network for variouslinear programming problems

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Abstract
Nowadays, there are various methods and techniques to find a solution to the problems occurring in the Linear Programming Problem. When developing a Linear Programming model, system and researchers often include all possible constraints although some of them may not be binding at the optimal solution.To achieve optimality in computational effort and also in accuracy,we proposed a hybrid algorithmic structure with training model for optimization of parameters in real time linear programming problem. This algorithm proposes the class based on the environment. It constructs input information using the input parameters and constraints using formal or conventional methods like complex algorithm and/or identifying redundant constraints before the predicted time. It forecasts the appropriate parameters. In case the predicted time or value belongs to any of the conditions, the value of parameters may vary. Forecast the appropriate parameters with the physical sensitivities. This structure improves the accuracy of bounded variables in linear programming problem model by suggesting the training and learning of parameters and constraints. This training is possible in real world application by applying artificial neural network.

Keywords: Linear Programming, Neural Network, Redundant Constraints, Back Propagation,Training Parameters.

Introduction:

The conventional methods such as regression-based method, Kalman filter concentrated only on achieving best computational effort whereas, accuracy of these systems may go down due to reducing number of constraints and number of iteration.To achieve optimality in computational effort and also in accuracy,we proposed a hybrid algorithmic structure with training model for optimization of parameters in real time linear programming problem. This algorithm proposes the class based on the environment. It constructs input information using the input parameters and constraints using formal or conventional methods like complex algorithm and/or identifying redundant constraints before the predicted time. This structure improves the accuracy of bounded variables in linear programming problem model by suggesting the training and learning of parameters and constraints. This training is possible in real world application by applying artificial neural network.

Training Methodology

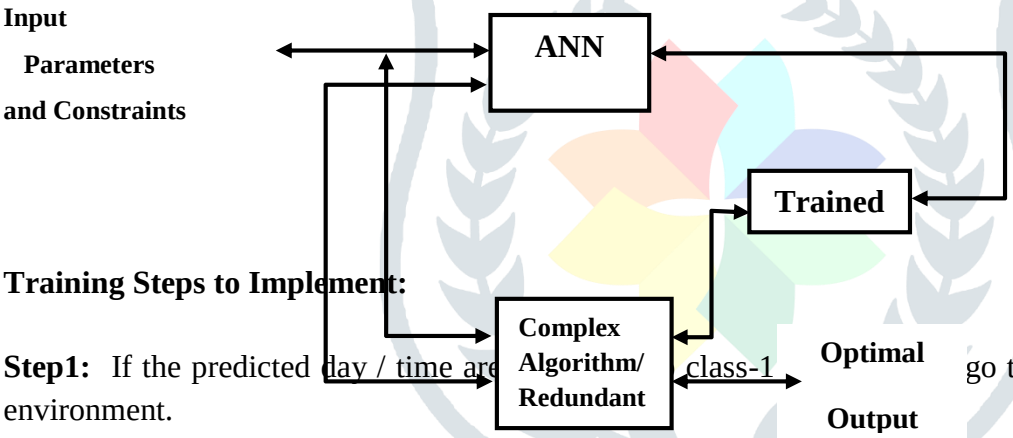
All the above methodologies concentrated only on achieving best computational effort whereas, accuracy of these systems may go down due to reducing number of constraints and number of iterations. To achieve optimality in computational effort and also in accuracy, we proposed a Hybrid Algorithmic Structure. If we reduce number of iterations, the time complexity become optimal, but the accuracy of the system become reduced. To improve the accuracy, we suggested training and learning of parameters and constraints. This

training is possible in realworld application by applying Artificial Neural Network (ANN). The ANN has been applied for various applications to predict forecasting of parameters, constraints and also to obtain optimality in real world parameters. To proceed further, we consider a real world application, for (eg.,) load forecasting. Load forecasting is essential in the electricity market for the participants to manage the market efficiently and stably. However, the electric power load forecasting problem is not easy to handle due to its nonlinear and random-like behaviors of system loads, weather conditions, and variations of social and economic environments, etc. Many studies have been reported to improve the accuracy of load forecasting using the conventional methods such as Regression-based method,(Papalexopolulos and Hesterberg,1990) Kalman filter (Trudnowski et al.,2001) and Knowledge-based expert system (Rahman and Bhatnagar,1988).

Using training Methodology

Complex algorithm / redundant constraints are used to achieve optimal in computational effort whereas ANN is applied to achieve accuracy in any process model.This training is possible in real world application by applying Artificial Neural Network (ANN). The ANN has been applied for various applications to predict forecasting of parameters, constraints and also to obtain optimality in real world parameters.

Figure: 1 Training Methodology



Training Steps to Implement:

Step1: If the predicted day / time are class-1 go to step 4 otherwise, it is class-2 environment.

Step2: Construct input information using the input parameters and constraints using any formal or conventional methods like complex algorithm and or identifying redundant constraints before the predicted day or time.

Step3: Forecast the appropriate parameters.

Step4: In case that the predicted day or time belongs to a class-1 situation, the value of parameters may vary.

Step5: Forecast the appropriate parameters with the physical sensitivities calculated in step 4. After taking the above steps, the normalized value of parameters is calculated from the data obtained. Thereafter, the parameters for any class of situation are forecasted from the normalized value.

Results:

The Training is possible in applications by applying Artificial Neural Network. I believe, the proposed algorithm shows increased performance in accuracy. The Hybrid Algorithm must be optimal in both computational effort and accuracy. All the above methodologies concentrated only on achieving best computational effort. But the accuracy of these systems may go down due to reducing number of constraints and number of iteration. This training trains the data by using methodology of layered network.

Figure: 2 Shows the training state of the network

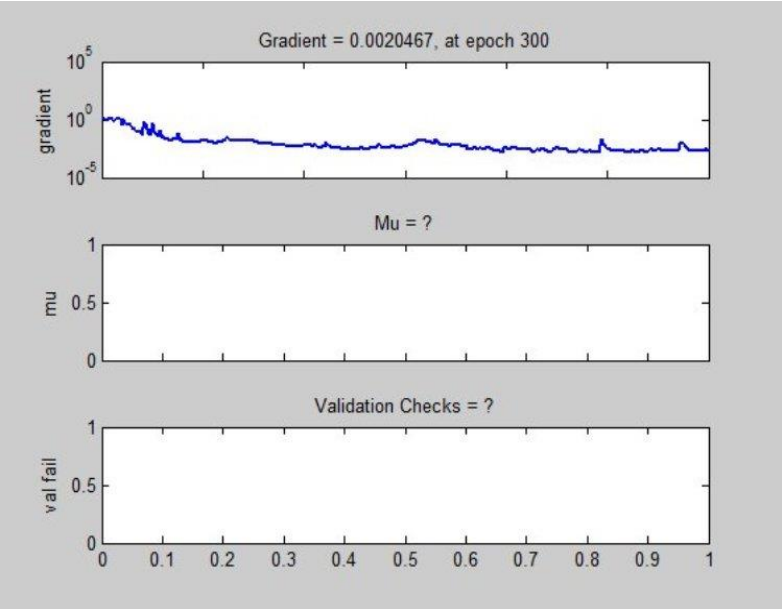
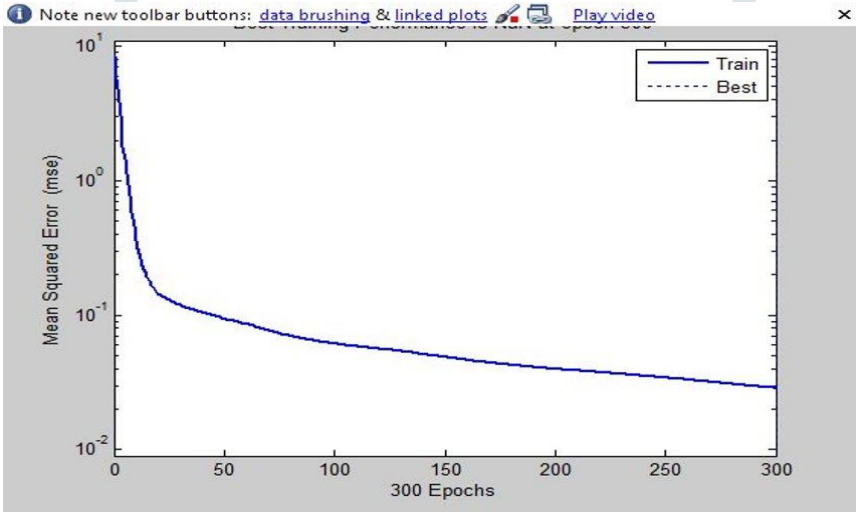


Figure: 3 Performance of the Training State



Conclusion:

This Methodology improves the accuracy of the variables in different type linear programming problem by suggesting the training and learning of parameters and constraints. The Training method is possible in applications by applying Artificial Neural Network. Hence we strongly believe, the proposed methodology shows increased performance in accuracy. The training method must be optimal in both computational effort and accuracy. All the above methodologies concentrated only on achieving best computational effort and reduce time whereas; accuracy of these systems may go down due to reducing number of constraints and number of iteration. To achieve optimality in computational effort and also in accuracy, we proposed a structure called training methodology with training steps for optimization of parameters in a real time Linear Programming Problem.

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