University of Baghdad	
Department	Electrical Engineering
Full Name	Younis Muhiy Nsaif
Thesis Title	Intelligent Modeling Techniques of Electric Power Load Forecasting
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Abstract	As far as electrical power system is concerned, there has been a need to find out the future load in advance. Load forecasting has played an important role in the generation, transmission and distribution system planning. Load forecasting of future load demand is significant for an economic and secured operation of power systems. In general, the objective of high-precision load forecasting is difficult to achieve due to complex effects on load by a variety of factors. This thesis focuses on the study of long term load forecasting by using multiple linear regression (MLR) method and using different types of computational intelligence methods such as feed forward Neural Network with back-propagation (BP) tuning algorithm (FNN-BP), feed forward Neural Network with particle swarm optimization (PSO) tuning algorithm (FNN-PSO) and Elman Neural Network with back-propagation (BP) tuning algorithm (ENN-BP). Such forecasts will be highly useful in proper system planning and operations. The algorithms have been demonstrated using simulation programs in MATLAB environment. The usefulness of the five forecasting techniques was tested on a test system data for a Big Utility Company (Egyptian Unified Network). The obtained results showed that the ENN-PSO method takes advantage of accuracy and efficiency in prediction. The ENN-PSO method was performed using population growth data on the Iraqi National Grid for the duration from 2014 to 2030.