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The Optimized Elastic Net Regression Model for Electricity Consumption Forecasting

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Abstract: Electricity is a significant power resource that is being hard to store physically. Energy policy aims to maintain continuous power supply to customers without shortage or waste of energy. To address this issue, this paper aims to provide a framework to forecast the future net electricity consumption of Turkey based on four factors (independent variables), namely, imports, exports, transmitted energy and gross generation, which have an impact on the net electricity consumption. The framework involves forecasting the independent variables using a nonlinear autoregressive-based neural network (NARANN) model. Afterward, an elastic net regression model is proposed to forecast the net electricity consumption of Turkey. Simulated annealing (SA) and evolutionary strategy (ES) were used to optimize the coefficients of the elastic net regression model. The results show that the proposed approach provides high accuracy for net electricity consumption forecasting.

Keywords: Energy Management, Time Series Forecasting, Regularization