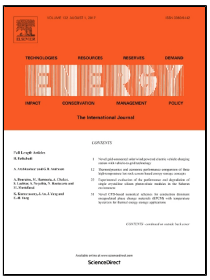
# Accepted Manuscript



Electricity Load Forecasting by an Improved Forecast Engine for Building Level Consumers

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# Electricity Load Forecasting by an Improved Forecast Engine for Building Level Consumers

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***Abstract* - For optimal power system operation, electrical generation must follow electrical load demand. So, short term load forecast (STLF) has been proposed by researchers to tackle the mentioned problem. Not merely has it been researched extensively and intensively, but also a variety of forecasting methods has been raised. This paper outlines a new prediction model for small scale load prediction i.e., buildings or sites. The proposed model is based on improved version of empirical mode decomposition (EMD) which is called sliding window EMD (SWEMD), a new feature selection algorithm and hybrid forecast engine. The aims of proposed feature selection algorithm is to maximize the relevancy and minimize the redundancy criterion based on Pearson's correlation (MRMRPC) coefficient. Finally, an improved Elman neural network (IENN) based forecast engine proposed to predict the load signal in this procedure. All weights of this forecast engine have been optimized with an intelligent algorithm to find better prediction results. Effectiveness of the proposed model is carried out to real-world engineering test case in comparison with other prediction models.**

***Index Terms* – Building electricity load, max-relevance min-redundancy, IENN, empirical mode decomposition.**

## I. INTRODUCTION

### *A. State of Art*

In the 1960s, different techniques used to forecast load demand were based on trend analysis [1]. In this period of time, not having witnessed drastic changes in economic conditions, fairly accurate forecasts of load demand have been achieved. But the 1970's saw an increase in inflation rates, fuel and capital costs [2]. The mentioned conditions gave rise to an unstable situation which couldn't be accounted for in the trend analysis [3]. Owing to such inaccuracies in prediction of load demand using pattern observation and trend analysis, forecasters realized the need to improve existing prediction methods and develop

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