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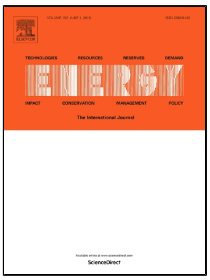

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Intelligent Techniques for Forecasting Electricity Consumption of Buildings

K. P. Amber[a,b]*, R. Ahmad[c], M. W. Aslam[d], A. Kousar[e], M. Usman[c], M.S. Khan[a]

[a]*Department of Mechanical Engineering, Mirpur University of Science and Technology (MUST), Mirpur-10250 (AJK), Pakistan*

[b]*Faculty of Engineering, Science and the Built Environment, London South Bank University, London SE1 0AA, UK*

[c]*School of Electrical Engineering and Computer Science, National University of Sciences and Technology, Islamabad, Pakistan*

[d]*Department of Computer Systems Engineering, Mirpur University of Science and Technology (MUST), Mirpur-10250 (AJK), Pakistan*

[e]*Department of Electrical (Power) Engineering, Mirpur University of Science and Technology (MUST), Mirpur-10250 (AJK), Pakistan*

khuram.parvez@must.edu.pk, rizwan.ahmad@seecs.edu.pk, waqar.cse@must.edu.pk, anila.pe@must.edu.pk, musman.msit15seecs@seecs.edu.pk, engr.sajidazam@yahoo.com*

Abstract

The increasing trend in building sector's energy demand calls for reliable and robust energy consumption forecasting models. This study aims to compare prediction capabilities of five different intelligent system techniques by forecasting electricity consumption of an administration building located in London, United Kingdom. These five techniques are; Multiple Regression (MR), Genetic Programming (GP), Artificial Neural Network (ANN), Deep Neural Network (DNN) and Support Vector Machine (SVM). The prediction models are developed based on five years of observed data of five different parameters such as solar radiation, temperature, wind speed, humidity and weekday index. Weekday index is an important parameter introduced to differentiate between working and non-working days. First four years data is used for training the models and to obtain prediction data for fifth year. Finally, the predicted electricity consumption of all models is compared with actual consumption of fifth year. Results demonstrate that ANN performs better than all other four techniques with a Mean Absolute Percentage Error (MAPE) of