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### **Performance comparison of extreme learning machines, genetic algorithm and neural networks (MLP) for classification of Epilepsy risk levels from EEG signals**

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The objective of this work is to give a performance comparison considering code converter as a pre-classifier and Extreme Learning Machine (ELM), Genetic Algorithm (GA) and neural network (MLP) as post classifiers for classifications of the epilepsy risk levels obtained from extracted features from EEG signals. The code converter acts as a level one classifier. The seven features such as energy, variance, positive and negative peaks, spike and sharp waves, events, average duration and covariance are extracted from EEG signals. A study of twenty patients is reported in this work. The performance of the code converter along with ELM, Genetic Algorithm and Neural Networks are compared based on the parameters such as Performance Index (PI) and Quality Value (QV). The risk level classification rate (%) for the code converter method before optimization is found to be 50% while it is 93.75% for Binary Coded Genetic Algorithm, 95.83% for MLP Neural Network and 93.31% for ELM. If the values of the Performance Index are analyzed, then it is 40% for code converter method before optimization, 93.33% for Binary Coded Genetic Algorithm, 95.65% for MLP Neural Network and 92.779% for ELM. Similarly, if the quality values are analyzed, it is 6.25 for the Code Converter before optimization, 20.14 for the Binary Coded Genetic Algorithm and 21.59 for the MLP Neural Network and 21.69 for the ELM method. This work aims at classifying the epilepsy risk level of epileptic patients from EEG signals. After having computed the values of PI and QV it is inferred that ELM was working perfectly with a high classification rate of 93.31% and a false alarm as low as 0.0156% with a Quality value of 21.69 and it is concluded to be the most versatile method.

#### **Biography**

Sunil Kumar Prabhakar is currently a Research Scholar at Bannari Amman Institute of Technology; Anna University, Chennai, pursuing his research in classification of epilepsy risk levels from epileptic encephalographic signals.

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