

Extreme Learning Machine as Maintainability Prediction model for Object-Oriented Software Systems

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Abstract— As the number of object-oriented software systems increases, it becomes more important for organizations to maintain those systems effectively. However, currently only a small number of maintainability prediction models are available for object oriented systems. In this paper, we develop an extreme learning machine (ELM) maintainability prediction model for object-oriented software systems. The model is based on extreme learning machine algorithm for single-hidden layer feed-forward neural networks (SLFNs) which randomly chooses hidden nodes and analytically determines the output weights of SLFNs. The model is constructed using popular object-oriented metric datasets, collected from different object-oriented systems. Prediction accuracy of the model is evaluated and compared with commonly used regression-based models and also with Bayesian network based model which was earlier developed using the same datasets. Empirical results from the simulation show that our ELM based model produces promising results in terms of prediction accuracy measures that are better than most of the other earlier implemented models on the same datasets.

Index Terms— Software maintainability, Extreme Learning Machines, Bayesian Network, Regression

