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ABSTRACT

Software Reliability is indispensable part of software quality and is one amongst the most inevitable aspect for evaluating quality of a software product. Software industry endures various challenges in developing highly reliable software.

Application of machine learning techniques for software reliability prediction has shown meticulous and remarkable results.

In this paper, we propose the use of machine learning techniques for software reliability prediction and evaluate them based on selected performance criteria. We have applied machine learning techniques including Adaptive Neuro Fuzzy Inference System (ANFIS), Feed Forward Back propagation Neural Network (FFBPNN), General Regression Neural Network (GRNN), Support Vector Machines (SVM), Multilayer Perceptron (MLP), Bagging, Cascading Forward Back propagation Neural Network (CFBPNN), Instance Based Learning (IBK), Linear Regression (Lin Reg), M5P, Reduced Error Pruning Tree (RepTree), M5Rules to predict the software reliability on various datasets being chosen from industrial software.

Based on the experiments conducted, it was observed that ANFIS yields better results in all the cases and thus can be used for predicting Software Reliability since it predicts the reliability more accurately and precisely as compared to all other above mentioned techniques.

In this study, we also made comparative analysis between cumulative failure data and inter failure time's data and found that cumulative failure data gives better and more promising results as compared to inter failure time's data.

Keywords: Software Reliability, Assessment, Prediction, Machine Learning Techniques.