

## Hybrid Approach for Software Defect Prediction Using Machine Learning with Optimization Technique

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**Abstract :** Software technology is developing rapidly which leads to the growth of various industries. Now-a-days, software-based applications have been adopted widely for business purposes. For any software industry, development of reliable software is becoming a challenging task because a faulty software module may be harmful for the growth of industry and business. Hence there is a need to develop techniques which can be used for early prediction of software defects. Due to complexities in manual prediction, automated software defect prediction techniques have been introduced. These techniques are based on the pattern learning from the previous software versions and finding the defects in the current version. These techniques have attracted researchers due to their significant impact on industrial growth by identifying the bugs in software. Based on this, several researches have been carried out but achieving desirable defect prediction performance is still a challenging task. To address this issue, here we present a machine learning based hybrid technique for software defect prediction. First of all, Genetic Algorithm (GA) is presented where an improved fitness function is used for better optimization of features in data sets. Later, these features are processed through Decision Tree (DT) classification model. Finally, an experimental study is presented where results from the proposed GA-DT based hybrid approach is compared with those from the DT classification technique. The results show that the proposed hybrid approach achieves better classification accuracy.

**Keywords :** decision tree, genetic algorithm, machine learning, software defect prediction

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