ABSTRACT

Success of any software organization depends on total customer satisfaction which in turn depends on the development of quality software. Software engineering methodology enables the production of quality software. One of the important characteristics of quality software is that it should be defect-free. The aim of defect detection and prevention is to provide quality software that will reduce the cost and time involved in fixing a defect, increase productivity and enable to achieve total customer satisfaction.

Software defects are expensive in terms of quality and cost. The cost of capturing and correcting defects is one of the most expensive software development activities. It will not be possible to eliminate all defects but it is possible to minimize the number of defects and their severe impact on the software quality. This is achievable by implementing a defect prediction process that focuses on improving software quality by decreasing the defect density.

Soft computing techniques such as data mining and machine learning algorithms can be applied on repositories of NASA dataset and software industries to extract useful information. Numerous studies have applied soft computing techniques (e.g. data mining (DM), fuzzy logic (FL), neural network (NN) and genetic algorithm (GA)) to the software defect prediction problem.

A significant motivation for using fuzzy logic is its ability to estimate required defect much earlier in the development process. Since many of the independent variables in software metric models are either difficult to quantify (for example complexity) or are only known to a rough degree (such as system size), the use of fuzzy variables seems intuitively appealing. However the applicability of fuzzy c means clustering (FCM), random forest methods to face the challenges of the software defect testing. However, the utilization of these methods as a research paradigm for formulating software defect prediction challenges needs further investigation. The goal is to stimulate interest in the software quality testing community and to promote the use of FCM, random forest and machine learning techniques for formulating problems in the field of software project success prediction.

The work uses integrated defect prediction model i.e. GA_FCM_RF for predicting software reliability. The work makes use of the design and development of genetic algorithm based fuzzy random forest classifier approach for estimation and prediction of the success of software project by considering accuracy level. The work demonstrates the effectiveness and application of GA_FCM_RF technology. By analysing the defects rate, project manager will be able to draw conclusions about the success rate of projects.