A Novel Efficient Automated Bug Assignment Approach Using Machine Learning

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Abstract

Developing an effective system for assigning bugs automatically to the right developers is important yet not an easy task. Previous studies in this domain have limitations such as providing recommendation for one developer only, ignoring newly hired developers, excluding the developer background in the learning process, and having issues in load balancing. This thesis develops a new approach for the automatic bug assignment based on three base methods; Developer-Bug Assignment Methods Using Profile Similarity, Developer-Bug Assignment Methods Using Association Rules, and Developer-Bug Assignment Methods Using Multilabel Classification. All of these methods end with the load balancing process. To evaluate the approach, we used a real dataset and a synthesized dataset. We used various evaluation measurements for each method. Experimental work showed that this approach solved the previously mentioned problems and

proved the efficiency of the proposed approach in terms of accuracy, training time, and execution time.

Keywords: Bug assignment, Machine Learning, Algorithms, Classification, Multilabel Classification, Load Balancing, Cosine Similarity, Association rules, Apriori.