An Architecture for Test Case Prioritization Based on Change and Effect Graphs Using Bayesian Networks

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Abstract

Most of the existing techniques in test case prioritization focus on maximizing the coverage in regression testing, under criteria of time and resource efficiency. Beside the criteria of time and resource efficiency, other techniques focus on to increase the rate of fault detection. This provides a faster feedback on the system under test. Techniques that aim to increase the rate of fault detection, generally use change information to detect faults during version upgrades. Instead of a coverage-based technique, we use a technique that focuses on using change information to increase the rate of detection. In this presentation, we propose an architecture for our test case prioritization technique, which uses a deep data flow analysis in order to predict the methods that will be effected, when a method is changed. In addition, by using call graphs and data flow analysis information, we construct change dependent Bayesian Network model of the new version of software. The Bayesian Network is used to obtain probabilistic information for each method that exists in the software. Based on the probabilistic values, the method with highest probability will be the method that has the highest priority and should be tested first. In this presentation, we will demonstrate the architecture and tool set we used in our test case prioritization technique based on Bayesian Networks.