Abstract

Though some components play a major role for enhancing the quality of a system, but exactly identifying those components at the early stage is a big challenge. Metrics that are designed at the early stage guide both the test manager and the system analyst in decision making. In this paper, we propose an Influence Metric at the architectural level to get the influence of a
Designing Influence Metric at the Architectural Level for Improving the Reliability of a System

component towards the system failures. First, we generate an intermediate graph called Sequence Diagram Graph (SDG) for a sequence diagram and compute the occurrence probability of each event within the sequence diagram based on operational profile of the system. Then, we propose an algorithm called Influence Computation Algorithm (ICA) to compute the influence of a component within a use case and within the whole system. The influence of a component c is decided by checking how many components are calling directly or indirectly the component c and the probabilities of their call to c. A component with high influence value is more sensitive towards system failures. The influence metric is applied on two well-known case studies and the sensitivity analysis is conducted through a set of experiments to validate our approach.

Reference

- ATM case study available: http://www.mathcs.gordon.edu/courses/cs211/ATMExample/.
Designing Influence Metric at the Architectural Level for Improving the Reliability of a System


Index Terms

Computer Science
Software Engineering

Key words

Operational Profile
Sequence Dependence Graph
Influence Metric