Design Pattern Detection using Genetic Algorithm for Sub-graph Isomorphism to Enhance Software Reusability

Abstract

Design patterns have been proposed as a technique to introduce reuse in design phase. In industry, it is focused to reuse design patterns as a reusable part when designing a new application. Reusable Design Pattern, that are proven solutions to common design problems, to improves many qualities of applications like Reusability and its maintainability. If better reusability is required for an application where design patterns were used, then an automated tool that can detect the used design pattern in the application will be useful. Therefore, a reliable design pattern discovery is required to promote software reusability. The techniques of finding an isomorphic sub-graph were used to solve design pattern detection in past. Furthermore, we are applying a hybrid genetic algorithm for sub-graph isomorphism problem which uses an incremental approach to detect design patterns. Moreover, detection is done with increasing the size of sub-problem step by step. A hybrid GA is applied to each sub-problem, initialized with the evolved population of previous step. This proposed work of identifying and then later reusing of design pattern facilitate to bring software design in reduced time and consequently expedite software reusability.
References


Index Terms

Computer Science Algorithms
Keywords

Design pattern, UML diagram, sub-graph isomorphism, genetic algorithm, incremental genetic algorithm.