

Title	依存関係生成モデルを用いたソフトウェア成果物の変更波及解析支援
Author(s)	小谷, 正行
Citation	
Issue Date	2008-03
Type	Thesis or Dissertation
Text version	author
URL	http://hdl.handle.net/10119/4198
Rights	
Description	Supervisor:落水浩一郎, 情報科学研究科, 博士

Change Impact Analysis Support for Software Artifacts using Dependency Generation Model

Masayuki Kotani

School of Information Science

Japa Advanced Institute of Science and Technology

9th January, 2008

Abstract

In this paper, I propose a set of new generable basic dependency relationships(BDRs) useful for change impact analysis, by analyzing dependency relationships of UML 1.5 to extract effective factor for change impact analysis. I also propose a method that generates BDRs from phases of a development process and UML diagrams included in the phases. The change impact analysis can be realized by tracing the BDRs generated among UML diagrams and their components.

I define four BDRs, such that 'Existing Together', 'Information Sharing', 'Copy', and 'Concept'. Their BDRs are defined by analyzing 'Dependency' in UML 1.5 and dependencies generated by developers implicitly.

The method uses the Dependency Generation Model consisting of comparison rules, addition rules and selection rules. The comparison rule selects a couple between UML elements which may have any BDR. The addition rule search types of BDR which may is set to that couple. The selection rule decide attached type of BDR to selected couple.

I also introduce the impact analysis tool based on proposed method.

I show the effectiveness of our approach by recall and precision of the analysis results of UML elements corresponds to both one concept, and concepts divided or merged one. I apply UML diagrams produced through case studies of elevator control system development and ATM system development. In the result, I get two useful case of proposed method as follows, based on a premise that the name of UML elements corresponds to one concept is the same or similar. Such that (1) analyzing the UML elements corresponds to one concept, (2) analyzing the creation order among major UML elements which are changed or became more detail in each phases from the use case.

Applying proposed method, the developer or the maintainer specify impacted UML elements easily. Then, the method contributes the reduction of costs in overall change work.

Key Words: UML, Dependency relationship, automatic generation, Impact analysis.