

A software for systematic identification and correction of design defects in object-oriented programs

Reference: VAL-502-UM

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Background

Design defects coupled with poor error feedback for programmers, impede good design practices and slow the evolution and maintenance of object-oriented architectures. To keep down the escalating costs produced by design defects (DD), numerous techniques and processes have been proposed to correct them in the software development process and to ease the maintenance of these programs. Because DD are detected semi-automatically and corrected manually, their root causes are not easily identified, making them difficult to eliminate during the development phase.

Technology

This software allows for the systematic detection and correction of DD.

By inputting an informal textual description of the DD to be corrected, a detection algorithm is generated that can function within the given program.

The algorithm then produces a description of the detected DD and proposes appropriate corrections.

A language has been developed to describe the defects according to the program's unique structures and semantic properties.

Applications

Applications include:

- Detecting and correcting DD during development
- Training and performance enhancement of programmers

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- Enabling quality control of software

Potential for:

- Enforcing quality standards
- Detecting any recurrent structures of copying, plagiarism, and malicious programs

Competitive advantages

UNIQUE: This is the first software that detects and corrects DD automatically.

SPEED. The software generates a list of DD quickly, even with large programs, lowering maintenance costs.

	Blob					Total
	ArgoUML 113 KLOC 1230 classes	Azureus 192 KLOC 1449 classes	GantiProject 192 KLOC 1449 classes	PMD 42 KLOC 423 classes	QuickUML 9 KLOC 142 classes	
Effectifs	91	143	19	15	3	271
Precisions	70/91 = 76.9%	82/143 = 57.3%	10/19 = 52.6%	3/15 = 20%	1/3 = 33.3%	166/271 = 61.5%
Time	40.5s	2m	5.6s	31.6s	2.1s	3m 19.8s

GENERIC. This software can be used with any object-oriented program. It is not necessary to develop an ad-hoc solution for each program.

STRUCTURE AND SEMANTIC ANALYSIS. This software produces a structure and semantic analysis that improves efficiency not only for the end-users of the program, but for the programmers themselves.

Business Opportunity

Univalor is seeking partners to support the development phase and to commercialize this technology.