6th International Conference on Applied Informatics
Eger, Hungary, January 27–31, 2004.

Comparison of Object-Oriented and Paradigm Independent Software Complexity Metrics

Zoltán Porkoláb, Ádám Sillye

Department of Programming Languages and Compilers,
Eötvös Loránd University, Faculty of Informatics
e-mail: {gsd, madic}@elte.hu

Abstract

Structural complexity metrics play important role in modern software engeneering. Testing, bug-fixing and maintenance covers more and more percentage of the software lifecycle. The cost of software maintenance is mostly depends on the structural complexity of the code. A good complexity measurement tool can trigger critical parts of the software even in developement phase, measure the quality of the code, predict the cost of testing efforts and later modifications.

With the raise of object-oriented paradigm, research efforts at both the academic world and the IT industry has focused metrics based on special object-oriented features, like number of classes, depth of inheritance or number of children. Several implementations of such metrics are available for the most popular languages (like Java, C++, ...) and platforms (like Eclips).

However object-orientation is not the only programming style used in software construction. We still have large number of legacy code written in procedural – or even unstructured – way. For these code object-oriented metrics are not suitable. Also in modern programming languages (most importantly in C++) multiparadigm design is frequently used. An adequate measure therefore should not be based on special features of *one* paradigm, but on basic language elements and construction rules applied to different paradigms.

In this article we make both theoretical and empirical comparison between such multiparadigm metrics and well-known object-oriented ones to decide their scope, identify strong and week points, and make suggessions on their practical usage.

Categories and Subject Descriptors:
D.1.5 [Programming Techniques]: Object-oriented Programming;
D.2.8 [Metrics]: Complexity Measures

Key Words and Phrases: Software complexity measures, Object-oriented complexity measures, Multiparadigm programming