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Interests in Open Source

The **Multiview** research project is heavily dependant on open source software for both its execution and its impact. The goal of Multiview is to build a programming environment that makes it possible to view and edit a program in various different ways, either simultaneously, or in rapid succession. All of the well known refactorings give rise to different views. For example, in-lining or out-lining methods or procedures, abstracting or concretizing instance variables, and pushing methods up and down the inheritance hierarchy, usually thought of as semantics-preserving program transformations, can also be thought of as defining two different views on a single (more abstract) program.

Other refactorings, which ought to be equally well-known, are not, because the underlying programming language is insufficiently expressive. For example, it ought to be possible to turn an object-oriented program, organized by classes, "on its side", so that it is organized by generic methods that operate by case discrimination on the instances of classes. However, languages such as Java cannot express the second form.

Our ultimate goal is to build a programming environment that enables programmers to work in radically new ways. This would be an impossible task if we had to build everything ourselves. So our efforts are massively leveraged by working with open source programming environments, chiefly Eclipse and Squeak Smalltalk. In Squeak we have prototyped a language feature— Traits—that supports multiple views of the way that a class is composed from components, and have built tools that support these views.

We are working on extending Traits to Java, a much more complex language, using the Eclipse environment, and collaborating with a group at IBM Watson Labs to use and enhance the "Concern Manipulation Environment" (CME), an open source plug-in for Eclipse, that supports decomposition of a Java program into "concerns" and the querying of the concerns for patterns of interest.

One of the Ph.D. students working on this project, Philip Quitslund, will be spending a week at Watson labs in April to work with the CME group. This would be impossible if both parties were not committed to open source.

Biography

Andrew P. Black has been a professor at PSU since September 2004. From 1994 to 2004 he was Professor and sometime department Head at OGI's department of Computer Science in Beaverton. Between 1986 and 1994 he was worked for Digital Equipment Corp, first heading the Distributed systems group and later as an internal consultant and member of research staff at the Cambridge Research Laboratory. From 1981 to 1986 he was an Assistant Professor at the University of Washington, where he worked on language support for two very early distributed systems projects. His research interests bridge programming languages and distributed systems.