

# Trusted Components

Winter Semester 2007

## Project Description

### General

The overall idea of this project is to perform automatic analyses of programs, applying various techniques presented in the course, such as: (simple) proofs based on axiomatic semantics; slicing; abstract interpretation; quality evaluation based on metrics. You will not have to cover all these techniques but should (in each project group) choose one of them during the project.

To avoid having to write the inevitable “front-end” (lexical analysis, parser, symbol table...) necessary for any program analysis, you will plug in directly into the EiffelStudio compiler mechanisms, which produce an Abstract Syntax Tree (AST) for any class or set of classes. This will enable you to work directly on the AST. You can also take advantage of the existing “Metrics Tool”, which performs measurements of numerous properties of programs and, beyond simple metrics, contains the germ of a comprehensive query mechanism for object-oriented programs.

You will be provided with a specification of the AST’s interface (API) and can ask Jason any question you have as you start using it.

The project has two parts:

1. The first assignment, due on October 24<sup>th</sup>, is common to all project groups; it consists of writing an analyzer that produces a data dependency analysis between two routines (of the same class or different classes), where  $r_1$  depends on  $r_2$  if and only if  $r_1$  may need to access an attribute that  $r_2$  may modify. You should send the classes that you added or modified to Jason in a zip file.
2. The second assignment, due in December 5<sup>th</sup>, consists of choosing another analysis or technique and to code it. You can make the choice on the basis of a short description that will be given in the first exercise session, complemented by a look at last year’s material covering these techniques. You should also check in advance with Jason that the chosen technique is valid and interesting enough. There will be a project presentation on Wed, December 5th. Make sure you have everything ready by then and a couple of slides to show.

The project will be conducted in a group with 3 people at most. Please send an email

to Yi Wei (Jason) at [yi.wei@inf.ethz.ch](mailto:yi.wei@inf.ethz.ch) including your names of group members before October 10<sup>th</sup>.

You should also produce a report of 5 to 10 pages on the whole project (parts 1 and 2) that should be sent to Jason by December 20<sup>th</sup>.

### **Development Environment**

You'll need EiffelStudio to compile and modify the code of EiffelStudio.

Eiffelstudio 6.0 GPL build 69618 is available at:

<http://dev.eiffel.com/downloads/releases/6.0/>

A C compiler is required for EiffelStudio, if you are using Linux, the GNU C compiler works very well. If you are using Windows, a C compiler is included in Windows SDK.

General information about how to check out the code of EiffelStudio and how to compile it is available from here:

[http://trustedcomponents.origo.ethz.ch/wiki/trusted\\_components\\_2007](http://trustedcomponents.origo.ethz.ch/wiki/trusted_components_2007)

Good luck!