

Program Monitoring

Lecture 1 : Introduction

<http://www.runtime-verification.org/course09>

Monday May 4, 2009

Welcome to this course on program monitoring. In this course we focus on how to monitor a single program execution in order to determine whether it conforms to a set of requirements. Such requirements must be stated formally in some notation. One possibility is to use the programming language itself. Another is to use some domain specific specialized logic/specification language. We shall explore both avenues in this course. Such monitors can be used for a variety of purposes, including testing/program understanding and fault protection. Although programmers have written more or less ad-hoc monitors since the birth of the computer, only recently (last decade) has this area achieved a status as a field on its own. In this course we shall specifically focus on notations for specifying properties of Java programs, and frameworks for monitoring such. The course will initially address the issue of program instrumentation and monitoring using aspect oriented programming and Java. This will not only provide you with a new useful technology but will also motivate tools presented later in the course. At the end of the course you will have gained insight into the important problems in the field and will have encountered a core selection of solutions for monitoring programs.

The first lecture is an introduction and is broadly focused, in contrast to subsequent lectures, which are more focused on specific technologies.

A General Remark on Resources

All resources needed during the course, such as slides, papers, website addresses, code examples, etc. will be available on the course website, organized according to the lectures where they are needed.

Installation

1. Install AspectJ. AspectJ works well in Eclipse for those who want to work with Eclipse (recommended). AspectJ will be the subject of the subsequent two lectures, and will be used by other systems to be presented later in the course.

Reading

1. Read the paper *An Overview of AspectJ*, Gregor Kiczales, Erik Hilsdale, Jim Hugunin, Mik Kersten, Jeffrey Palm and William G. Griswold.
2. Start browsing the AspectJ documentation.

Note: Lectures 2 and 3 will have the same reading material as Lecture 1. The AspectJ documentation takes some time to grind through.