Formal Techniques for Java-Like Programs
Report on the 10th Workshop FTfJP at ECOOP 2008

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Abstract. This report gives an overview of the 10th Workshop on Formal Techniques for Java-like Programs at ECOOP 2008. It explains the motivation for the workshop, and summarizes the presentations and discussions.

1 Introduction

Formal techniques can help analyze programs, precisely describe program behavior, and verify program properties. Newer languages such as Java and C\# provide good platforms to bridge the gap between formal techniques and practical program development, because of their reasonably clear semantics and standardized libraries. Moreover, these languages are interesting targets for formal techniques, because the novel paradigm for program deployment introduced with Java, with its improved portability and mobility, opens up new possibilities for abuse and causes concern about security.

Work on formal techniques and tools for programs and work on the formal underpinnings of programming languages themselves naturally complement each other. This workshop aims to bring together people working in both these fields, on topics such as: program verification, formal models and extensions of Java-like languages, program analysis, and type systems.

The workshop was organized by Marieke Huisman (INRIA Sophia Antipolis, France), Sophia Drossopoulou (Imperial College London, UK), Susan Eisenbach (Imperial College London, UK), Gary T. Leavens (University of Central Florida, USA), Peter Müller (Microsoft Research, Redmond, USA), Arnd Poetzsch-Heffter (University of Kaiserslautern, Germany), and Erik Poll (Radboud University Nijmegen, Netherlands). The selection of papers was done by a larger program

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committee chaired by Marieke Huisman. The committee members are listed at the end of this report.

Around 40 people attended this full-day workshop. A representative list of participants is given at the end of this report. A number of other participants dropped by for specific presentations, to chat with particular speakers, etc. To encourage cross-fertilization with related research areas, the IWACO and FTfJP workshops organized a joint workshop dinner.

**Overview of the presented papers.** Sixteen research papers were submitted, of which eleven were accepted for presentation at the workshop. The program committee made its selection after a fruitful discussion. Besides quality of the submission, also potential interest of the presentation for the workshop participants was used as a criterion.

The accepted papers are collected in informal proceedings that are available as technical report ICIS-R08013 from the Radboud University Nijmegen, Netherlands, available at [http://www.cs.ru.nl/~erikpoll/ftfjp/FTfJP08](http://www.cs.ru.nl/~erikpoll/ftfjp/FTfJP08)

The topics addressed by the presented papers are:

- program verification;
- formal models and extensions for Java-like languages;
- program analysis; and
- type systems.

For each topic, the sections below briefly describe the presentations and discussions.

## 2 Program Verification

Jan Smans talked about joint research with Bart Jacobs and Frank Piessens on the verification of implicit dynamic frames. Dynamic frames are a powerful mechanism for modular verification. They propose a technique that avoids the need to explicitly specify and verify frame conditions; these are replaced by accessibility predicates from which an upper bound on the set of locations that may be modified can be inferred. The technique has been implemented in a tool set, and Jan demonstrated how it could be used to verify several challenging examples. The discussion following the presentation revolved around the similarities with Banerjee et al.’s work on regional logic which was to be presented in the following days as a part of ECOOP’s technical track. In regional logic, region expressions can be used to explicitly specify read and write effects that, similar to dynamic frames, needs to be checked at verification time. Implicit dynamic frames do not require these explicit annotations but rely on inferring frame information from preconditions. Finally, the discussion also touched briefly on the subject of patterns, in particular the application to examples involving more layers of structure, e.g. the Composite pattern, which would be useful to test the practical usability of the proposed tool set. However, this did not arrive at any conclusion.