

Robust Software Engineering
Automated Software Verification - Robust Software Engineering Group

JOINT JAVA PATHFINDER FIELD TEST WITH FUJITSU

HIGHLIGHT: The Java Pathfinder (JPF) team of the RSE group has conducted a comprehensive field test with Fujitsu Laboratories of America and Fujitsu Japan to validate and mature the JPF tool suite in the context of large industrial applications. According to Fujitsu:

"The Java Pathfinder model checking tool architected and developed at NASA Ames Research laboratories was used to detect bugs in an internal Fujitsu code base that ran into one million lines of Java code. First the application was converted into a fully executable stand-alone Java model. With the active support of the NASA Ames team, the researchers at Fujitsu Laboratories of America (Sunnyvale) and Fujitsu Laboratories Limited (Kawasaki, Japan) were able to uncover injected (seeded) bugs in the application model that sent the model into panic mode. In this process the Java Pathfinder tool explored approximately 125,000 program states and millions of paths which would be impossible to cover using conventional testing techniques. The tool also uncovered an unexpected deadlock situation in the application model."

Based on this success, Fujitsu Laboratories of America are planning to extend the collaboration regarding other JPF applications.

JPF was developed by the RSE group, and open sourced under the NASA license in April 2005. It can be obtained from <http://javapathfinder.sourceforge.net>

BACKGROUND: JPF is a tool suite for software model checking of Java bytecode programs. It is used as a replacement of the 'java' command, to execute applications in a variety of ways in order to find program defects like deadlocks and unhandled exceptions. JPF can systematically explore different thread scheduling sequences, and supports variation of test data with user defined heuristics. There are various extensions for guided model checking (e.g. for UML statecharts and user interface model checking), symbolic execution (for automatic test case generation), compositional verification, and numerical analysis. For further information, please see <http://javapathfinder.sourceforge.net>

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