Course Information

The class will be hands-on: we will study and experiment with a high-performance and very flexible Java virtual machine. The VM in question is known as Jalapeño. I have been using it for some time as a research tool and have been very happy with the ease of understanding and of modification. A peculiar and helpful aspect of Jalapeño is that it is itself written entirely in Java.

Jalapeño was developed at IBM Research, and it includes the garbage collector toolkit from UMass. It was recently renamed “Jikes RVM”, and its source code is now freely available. See: http://www-124.ibm.com/developerworks/oss/jikessrvm/.

We will start the class off by reading several research papers and tutorials from the Jalapeño project and by browsing the source code. We will then design individual or group projects, which can include performance measurements of the existing system, modifications to the compilers (there are two in Jalapeño, and no bytecode interpreter), and modifications to the run-time system (including memory management).

I especially encourage undergraduates and master’s students who are looking for thesis topics, and have an interest in Java and in language implementation, to take this class. (Master’s students not looking for thesis topics: this fulfills the requirement for an advanced course in system design.)

Assignments and grading

In-class presentations (30%) and an implementation project (70%).

Meetings

By arrangement: contact instructor by email before semester begins!

Instructor

Darko Stefanovic, office FEC 345C, phone 2776561, email darko@cs.unm.edu — office hours Mondays 3:00-3:50, or by appointment.

Reading material

All reading material is freely available, mostly in the ACM Digital Library.
Class Meetings

- Jalapeño (JRVM) tutorial (3 meetings)
- 4 March - Sergiy Kyrylkov - Dynamic Type Checking in Jalapeño The Usenix Java Virtual Machine Research and Technology Symposium, April, 2001.
- 1 April - Trek Palmer - A Comparative Study of Static and Profile-Based Heuristics for Inlining 2000 ACM SIGPLAN Workshop on Dynamic and Adaptive Compilation and Optimization (DYNAMO’00), Boston, Massachusetts, January 19-21, 2000.
- Project Presentations (2 meetings)