Java is one of the most actively evolving languages with regard to the development of new APIs, libraries, and tools. It is applicable to problems ranging from embedded systems to enterprise applications. To allow both practitioners and researchers to keep up with the rapid pace of development, the International Conference on Principles and Practices of Programming in Java (PPPJ) was brought to life and has been growing steadily ever since.

PPPJ 2006 was held in Mannheim, Germany at the well-known Area of Information Systems of the local university. The conference was a great success, with lively discussions, well-attended tutorials, and a well-received evening program. A central part of the conference’s developing tradition is the conference special issue in the Science of Computer Programming Journal. We are proud to present you again with a cream-of-the-crop selection of papers from our conference. As last time, our goal for this special issue is to provide you with papers which appeal to a broad audience of Java specialists on the one hand and to highlight the versatility of the Java programming language on the other.

One main focus of this special issue are papers about the language Java. For example, Feng Xian, Witawas Srisan, and Hong Jiang look at an often neglected aspect of Java’s performance. In their paper “Garbage Collection: Java Application Servers’ Achilles Heel” they address several key issues related to a Java-based server’s ability to sustain top performance in spite of the ever changing demands from users. In the paper “Dynamic Analysis of Java Program Concepts for Visualization and Profiling”, Jeremy Singer and Chris Kirkham investigate the possibility of using concept information about functionally related source code units for a dynamic analysis of programs.

A second important topic of the conference is found in papers related to the programming environment of Java. In his paper “Java Heap Protection for Debugging Native Methods”, Yuji Chiba provides an interesting new technique to use with debugging in native methods, including performance measurements. Bernd Mathiske, Doug Simon, Dave Ungar present to you a paper that describes “An Assembler and Disassembler Framework for Java™ Programmers”.

Last but not the least, there are extensions to the Java language, be they on API or VM level. “Streaming Support for Java RMI in Distributed Environments” by Chih-Chieh Yang, Chung-Kai Chen, Yu-Hao Chang, Kai-Hsin Chung, and Jenq-Kuen Lee introduces novel methodologies for enhancing the streaming capabilities of Java RMI. Heinz Kredel showcases the use of Java as an implementation language for a starting part of a computer algebra library in his paper “On a Java Computer Algebra System, its Performance and Applications”. In “Enabling Declarative Security Through the Use of Java Data Objects” Matthias Merz represents an intermarriage of a role-based permission system based on JAAS and the JDO persistence layer. Finally, Raffaele Quitadamo, Giacomo Cabri, and Letizia Leonardi look at thread migration techniques in a Java-based distributed environment in their paper “Mobile JikesRVM: a Framework to Support Transparent Java Thread Migration”.

We hope that you will enjoy the selected highlights of the PPPJ 2006 as much as we did at the conference. Before moving on to the papers, though, we would like to thank the many people who supported us during the creation of this special issue. This special issue would not have been possible without the help of many people besides the actual authors. Allow us to use this context to briefly thank the independent reviewers of this issue. We hope that their helpful and professional remarks have contributed to make this special issue interesting and useful for the readers. We would also like to thank Bas van Vlijmen and Jan Bergstra whose guidance was very helpful in our editorial process.

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Ralf Gitzel is a life cycle cost specialist at ABB’s German research center. His research interests include Distributed Software Architecture and Cost Modeling for industrial plants. Having enjoyed the editorial work for this special issue, Ralf would be pleased to be contacted by you with suggestions, criticism, or other remarks. You can reach him at ralf.gitzel@hotmail.de.

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