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Guest Column

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| Going Open Source Software in IT – Opportunities and Challenges | 7 |
| <i>By Dave Thomas</i> | |

Source code propagates bad practices as fast as or faster than good practice so as one would expect there are a large number of unfinished or very poorly coded OSS projects, making project selection a critical factor.

Classification Theory

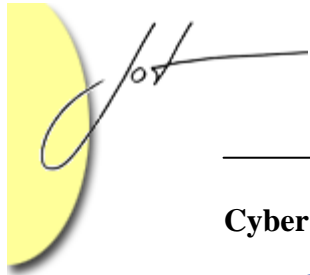
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| The Theory of Classification, Part 17: Multiple Inheritance and the Resolution of Inheritance Conflicts | 15 |
| <i>By Anthony J.H. Simons</i> | |

The author considers the theoretical issues raised by combining multiple implementations. Then, he considers what it means for an object to belong to multiple parent classes, defining the notion of *multiple classification*.

Java at Large

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| Java Optimization for Superscalar and Vector Architectures | 27 |
| <i>By Douglas Lyon</i> | |

The present state-of-the-art in computer hardware has outpaced the current state of the distributed JIT (Just-In-Time) compilers. We have resorted to modifying our Java code to make use of JNI (Java Native Interface) based vector-accelerated C programs to obtain speed-ups from 2 to 10 times.



Cyber Database

On Metadata Management Technology: Status and Issues 41

By Won Kim

Metadata captures the semantics of data in disparate data sources in an integrated enterprise information system. As such, there has long been a universal agreement on its importance. However, there are only a small number of vendors that offer metadata management systems as a separate product.

Strategic Software Engineering

Metrics 49

By John D. McGregor

The fundamental idea behind GQM is to maintain traceability from a goal to the metrics that are intended to measure progress toward that goal. This results in metrics that are more relevant, and more accurate.

Educator's Corner

Generic Red-Black Tree and its C# Implementation 59

By Richard Wiener

A fascinating and important balanced binary search tree is the **red-black** tree. Rudolf Bayer invented this important tree structure in 1972, about 10 years after the introduction of AVL trees. He is also credited with the invention of the B-tree, a structure used extensively in database systems. Bayer referred to his red-black trees as “symmetric binary B-trees.” A full C# implementation of a constrained generic Red-Black tree is presented.

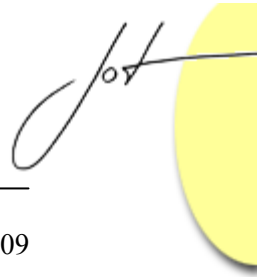
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Association Implementation 81

By David Johnson

More than 80% of Object Oriented applications require persistence support, most of which is implemented using relational databases. In spite of this, the topic of object persistence, and of the use of relational databases for persistence in particular, is poorly addressed in OO literature.



On theory and practice of Assertion Based Software Development

109

By Herbert Toth

Customers want programs to be flexible, robust, efficient, non-expensive, correct, and moreover to be ready yesterday – and all this regardless of all the mostly negative impacts of various other project relevant circumstances. As in other engineering disciplines, reuse of existing components with well defined interfaces is regarded to be the only realistic approach to meet the needs of software industry. No surprise that a considerable number of programming languages and development methods have been proposed during the last three decades to help software engineers create such reusable abstractions.

An Etymological and Metamodel-Based Evaluation of the Terms “Goals and Tasks” in Agent-Oriented Methodologies

131

By Brian Henderson-Sellers, Quynh-Nhu Numi Tran and John Debenham

While there are many individual models of agent architecture, there is a general agreement that agents are able to act without the intervention of humans or other systems. They have control both over their own internal state and over their behaviour. This may be achieved by some mechanism that determines which goals they should commit to achieving and then which decisions need to be taken in order to reach those goals.

Accessing Objects Locally in Object-Oriented Languages

151

By Keehang Kwon

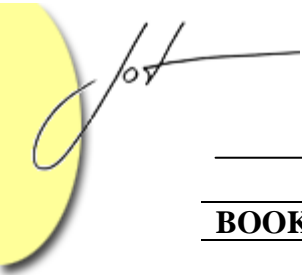
Kwon proposes method invocation constructs that allow objects to be accessed locally in object-oriented languages. The major construct is the expression of the form O.E where O is an object and E is an expression.

Implementing the π -Calculus in Java

157

By Liwu Li

The π -calculus was introduced by Milner for modeling the changing connectivity inside mobile communicating systems, in which links between concurrently running processes can be passed from processes to processes and a process can use a received link to communicate with another process. It is similar to the situation that the λ -calculus is a theoretical model of sequential computation. The π -calculus can be used to model modern concurrent systems.



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