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Lars Asplund (Ed.)

Reliable Software Technologies – Ada-Europe

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on Reliable Software Technologies
Uppsala, Sweden, June 8-12, 1998
Proceedings

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Foreword

The third International Conference on Reliable Software Technologies – Ada-Europe'98 took place in Uppsala, Sweden, from June 8 to 12, 1998. It was the 18^{th} conference organized by Ada-Europe in co-operation with ACM and is the main Ada event in Europe with its counterpart being the SIGAda Conference in the USA in fall.

The programming language Ada with the new standard, Ada 95, is very stable and mature. The language itself provides support for distributed systems, real-time systems, object-oriented programming and design, and the implementation of High Integrity Systems.

The importance of reliable software has grown over the years, and we are today dependent on software in a large number of areas where a malfunction of the software can result in loss of human lives. The programming language Ada may not be the ultimate solution, but it is definitely the best programming language available today for safety critical software. It is not by chance that Boeing decided to use Ada in its fly-by-wire 777 aircraft. The FAA (Federal Aviation Administration) has very strict rules for certifying an avionics system according to the standard DO-178B.

The importance of High Integrity Systems will be more pronounced in the future due to the increased capacity of micro-controllers, and the temptation to use more and more complex software. Other areas where safety is already known to be crucial are systems for nuclear power plants and medical applications.

Ada is being used in real-time systems and with the new abstraction, the protected object, it is now possible to efficiently implement a real-time system using tasks, protected objects, priority inheritance, and the priority ceiling protocol. By the use of these features and methods a system can be guaranteed to meet deadlines, avoid deadlocks, and keep blocking time to a minimum for high priority tasks.

The use of the Internet has exploded over the last few years, and we now see many innovations. We get not only documents with text but also pictures and sound. The documents are also now equipped with programs. The new technology works well with Ada, and the abstract machine for executing the Java byte code can be utilized by an Ada compiler thereby giving us access to a safe programming language for the design and implementation of Graphical User Interfaces.

The three invited keynote speakers, who gave talks about the current and future use of Ada and important aspects on safety critical systems, were:

- *Franco Gasperoni*, E.N.S.T. Paris, France, Embedded Opportunities
- *Pierre Chapront*, GEC Alsthom Transport, Saint Ouen, France, Ada+B The formula for safety critical software development
- *Martyn Thomas*, Chairman Emeritus, Praxis Critical Systems Ltd, U.K., Engineering Quality in Software

The technical program of the conference features 23 papers, selected by a program committee of highly qualified researchers in academia and industry in the following sessions

- Ada 95 and Java
- Ada 95 Language and Tools
- Distributed Systems
- Real-Time Systems
- Case Studies and Experiments
- Software Quality
- Software Development Methods and Techniques
- Software Architectures
- High Integrity Systems

The conference also contained an excellent set of tutorials, featuring international experts who presented introductory and advanced material on software engineering:

- Ada 95 as a Foundation Language for Undergraduate Programs, *Michael B. Feldman*
- Java for Ada Programmers, *Ben Brosgol*
- Software Systems Architecture: A Practical Architecture Method, *David Emery, Rich Hilliard, Timothy Rice*
- Distributed Systems Annex of Ada 95 and an Inside Look at the GLADE Implementation, *Laurent Pautet, Samuel Tardieu*
- The End of the Age of Miracles, *Richard T. Dué*
- Ada-Based Systems Engineering with O4S, *Ingmar Ögren*
- Building Development Tools for Use with GNAT, *Cyrille Comar, Sergey Rybin*
- Ada, Java & GNAT: A Manager's and Developer's Roadmap, *Franco Gasperoni, Edmond Schonberg*
- Guaranteeing Timing Requirements under Real-Time POSIX, *Michael González Harbour*
- SPARK, *John Barnes*

Many people have contributed towards making this conference a success.

Kristina Lundqvist deserves my sincere gratitude for her work as tutorial chair and as a much valued colleague for planning the conference generally. Örjan Leringe has taken care of the practical arrangements, and I am very thankful for his effort with the Web pages, and the printed program. I also would like to thank May-Lill Hansen for her efforts in getting exhibitors to the exhibition.

Last but not least I would like to thank the program committee members, for their hard work during the review process.

The technical program was complemented by a number of social events, the highlight being the musical divertimento by ACT.

March 1998 Lars Asplund

Organization

The International Conference on Reliable Software Technologies – Ada-Europe'98 was organized by Ada-Europe, in cooperation with ACM/SIGAda.

Executive Committee

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