

ALMA Facilitates Programming

First Demonstration of New Tool Chain for Embedded Multi-core Processors at the DATE 2014 Conference in Dresden

Under the ALMA EU project, researchers develop a new integrated tool chain for the simple programming of software for multi-core processors. The project is coordinated by the Karlsruhe Institute of Technology (KIT). At the DATE 2014 conference taking place in Dresden until March 28, the consortium now demonstrates automatic parallelization of software with the ALMA tool chain at booth EP 6. The tool chain facilitates programming from a high abstraction level and is suited for various hardware architectures.

An increasing number of electronic products, such as personal computers, smartphones, and cameras, are equipped with multi-core processors. Several processor cores are integrated on one chip. As a result of this integration, space and energy needed are minimized and computing capacity is increased. However, the capacity also depends on how well the software is parallelized, i.e., how homogeneously calculations are distributed to processor cores. So far, programming of applications for embedded multi-core systems has been associated with a high time and cost expenditure. Highly specialized knowledge has been required, as the number of processor cores increases continuously and architectures become increasingly complex.

The ALMA consortium coordinated by Professor Jürgen Becker, Head of the Institute for Information Processing Technology (ITIV) of KIT, has now developed a tool chain that considerably facilitates the work of programmers. It hides the complexity of the hardware architecture and, at the same time, generates a parallel program code optimized for multi-core processors. For this purpose, it uses an abstract description language (ADL) to define the target architecture. The tool chain implements algorithms for parallelization and optimization of a group of multi-core architectures. Among others, the ALMA consortium has developed ADL descriptions for the KAHRISMA reconfigurable multi-core architecture developed by KIT.

“At the DATE 2014 conference, we will demonstrate programming with the ALMA tool chain from the front-end software to a multi-core simu-

Monika Landgraf
Chief Press Officer

Kaiserstraße 12
76131 Karlsruhe, Germany
Phone: +49 721 608-47414
Fax: +49 721 608-43658
E-mail: presse@kit.edu

**For further information,
please contact:**

Margarete Lehné
Press Officer
Phone: +49 721 608-48121
Fax: +49 721 608-43658
E-mail:
margarete.lehne@kit.edu

lator,” explains computer scientist Timo Stripf of KIT’s ITIV. An application for image processing will be used as an example of a front-end software. The ALMA project concentrates on the areas of image processing / object recognition as well as mobile communication, but it is also relevant to many other applications. The new tool chain reduces both development time and costs.

ALMA (Greek for “jump”) stands for “ALgorithm Parallelization for Multi-core Architectures.” The project started in September 2011 and is scheduled for three years. ALMA is funded with about EUR 3.2 million by the EU under the 7th Framework Programme. Seven partners of research and industry cooperate in the consortium: Apart from the KIT, the Fraunhofer Institute of Optronics, System Technologies and Image Exploitation (IOSB) in Karlsruhe and Ettlingen, the University of Rennes 1 (France), the University of Peloponnese and the Technological Educational Institute of Western Greece (both Greece) as well as Recore Systems B.V. (the Netherlands) and Intracom Telecom (Greece) are involved in ALMA. The project strengthens the position of Europe on the worldwide market of tool chains for software development for multi-core systems.

The DATE (Design, Automation & Test in Europe) conference taking place in Dresden from March 24 to 28, 2014, is the largest conference for design automation of electronic systems worldwide.

Karlsruhe Institute of Technology (KIT) is a public corporation according to the legislation of the state of Baden-Württemberg. It fulfills the mission of a university and the mission of a national research center of the Helmholtz Association. Research activities focus on energy, the natural and built environment as well as on society and technology and cover the whole range extending from fundamental aspects to application. With about 9000 employees, including nearly 6000 staff members in the science and education sector, and 24000 students, KIT is one of the biggest research and education institutions in Europe. Work of KIT is based on the knowledge triangle of research, teaching, and innovation.

This press release is available on the internet at www.kit.edu.