

# AUTOMATIC CUSTOMIZABLE TOOL-CHAIN FOR HETEROGENEOUS MULTICORE PLATFORM SOFTWARE DEVELOPMENT

## TouchMore

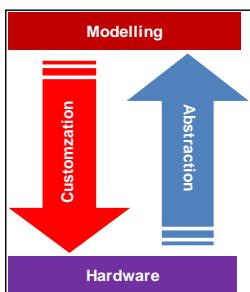


### Key innovation

Recent trends in embedded system architectures brought a rapid shift towards multicore, heterogeneous and reconfigurable platforms. This makes chip design enormously complex and imposes a large effort for the programmers to develop their applications. For this reason, new and more efficient tools for software development are needed to ensure software productivity and time to market of new applications. In particular, the automation of the software design process starting from high level models all-the-way down to a customized and implementation on specific architectures is a key factor to increase programmer productivity.

The TouchMore project will develop software tools that facilitate energy efficient and robust software for Heterogeneous Multicore Systems (HeMCS) with the goal to reduce the time-to-market in the design of such systems by at least 15%, as well as the cost of software design through the automation process by 20%.

### Technical approach



In detail, the center of the methodology is the high level modeling language (UML/SysML) that will be used to describe the target platform and application. High level modelling allows an architectural independent description of the application and for this reason it is prone to customization for different architectural templates.

In TouchMore, customization will be performed in an automated way through automated generation of parallel code for multicore tiles and the required mechanisms to manage reconfigurable DSPs/accelerators. In addition, the TouchMore tool-chain customization environment will focus on energy efficiency and robustness of the generated code, where the uncertainties due to fabrications of transistors in nanometer

#### Contract number

288166

#### Project coordinator

**Politecnico of Turin**

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#### Project website

[www.touchmore-project.eu](http://www.touchmore-project.eu)

#### Community contribution to the project

2.9 M Euro

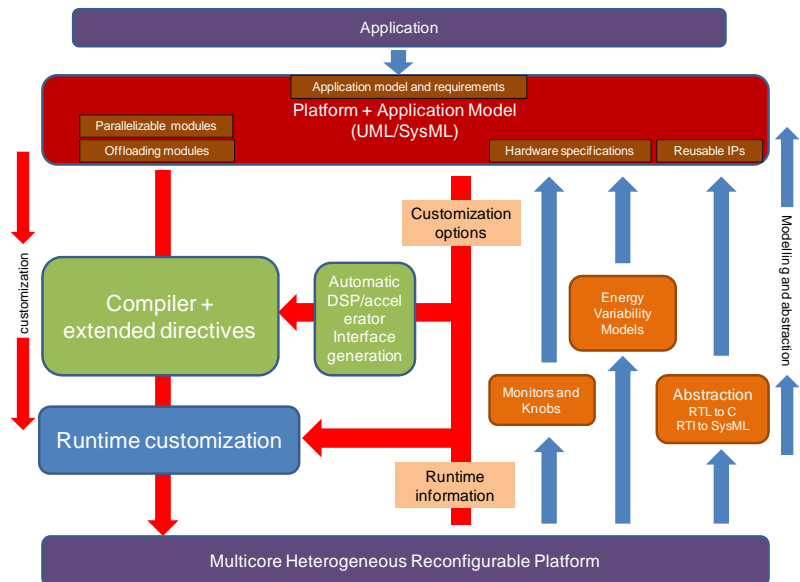
#### Project start date

01 09 2011

#### Duration

30 months

technologies will be hidden, thus mitigating their impact in terms of energy and performance. From a research perspective, TouchHMore is a pioneering project taking a pragmatic approach to bring variability issues into the software design flow. Together with the automatic tool-chain customization strategy coupled with high level modeling, these contributions will give the European research on embedded software a leading position.



touchHMore partners	Country
Politecnico di Torino	IT
Università degli Studi di Verona	IT
ATEGO UK	UK
CEA	FR
CSEM	CH
AKHELA SRL	IT
ATEGO FR	FR
University of York	UK

## Demonstration and Use

A complete automatic customizable tool-chain for multicore platform will be developed and evaluated on a complex heterogeneous next generation multicore chip designed by CEA and CSEM including clusters of general purpose processors as well as DSPs. The evaluation is obtained using automotive infotainment applications provided by AKHELA. The generated code will be optimized for the selected platform considering energy-efficiency and robustness with respect to process variabilities.

## Scientific, Economic and societal Impact

The project results will be commercially exploited by the SME ATEGO as a specialised software tool vendor and by the company AKHELA that is an IT services and Embedded Systems provider to large scale companies in areas such as automotive, avionics and consumer electronics. The project results will strengthen their position in their respective markets by enabling the production of products faster and more timely than the world wide competitors and it is expected that they will have a manifold return on their investment. The five research institutions will use the gained knowledge to enrich their teaching and research activities enabling them to stay at the forefront of technology and substantiating their prestige in the scientific community.

### Key Features

- Consistent (20%) reduction of time to market and cost for the design of complex multicore infotainment systems
- Reduction in the cost of the system design by 15% through automation and customization of code generation
- Achievement of energy efficiency and robustness in next generation multicore platforms