

Poster

Embedded Multi-Core systems for Mixed Criticality applications in dynamic and changeable real-time environments

Eduardo Tovar

CISTER-TR-151209

2015/03/24

Embedded Multi-Core systems for Mixed Criticality applications in dynamic and changeable real-time environments

Eduardo Tovar

CISTER Research Center

Polytechnic Institute of Porto (ISEP-IPP)

Rua Dr. António Bernardino de Almeida, 431

4200-072 Porto

Portugal

Tel.: +351.22.8340509, Fax: +351.22.8321159

E-mail: emt@isep.ipp.pt http://www.cister.isep.ipp.pt

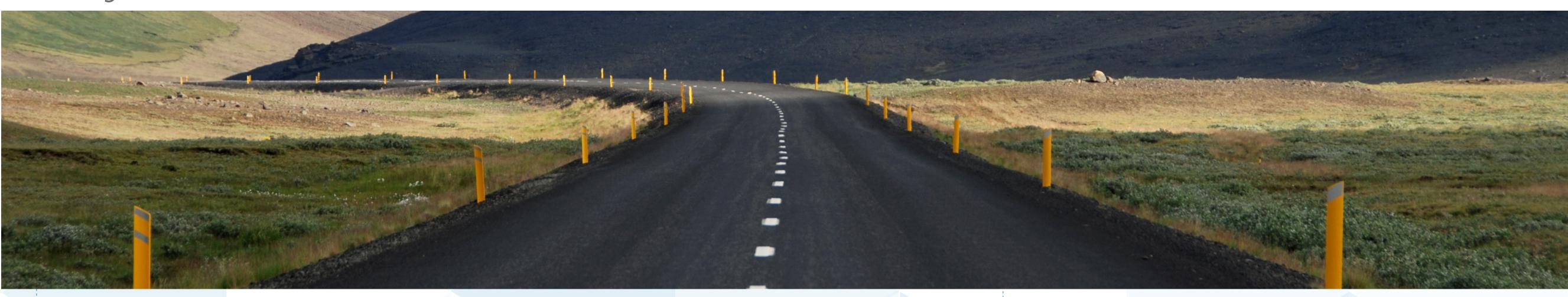
Abstract

EMC2 finds solutions for dynamic adaptability in open systems. It provides handling of mixed criticality multicore applications in r eal-time conditions, withscalability and utmost flexibility, full-scale deployment and management of integrated tool chains, through the entire lifecycle.

EMC²

Embedded Multi-Core systems for Mixed Criticality applications in dynamic and changeable real-time environments





PROJECT description

EMC² finds solutions for dynamic adaptability in open systems. It provides handling of mixed criticality multicore applications in real-time conditions, with scalability and utmost flexibility, full-scale deployment and management of integrated tool chains, through the entire lifecycle.

RELLEVANCE CALL 2013 objectives

- EMC² reduces cost of the system design by 15%.
- > It reduces by 15% the effort and time required to re-validate systems after making changes.
- It achieves 15% reduction in development cycles, especially in sectors requiring qualification or certification.

MARKET innovation

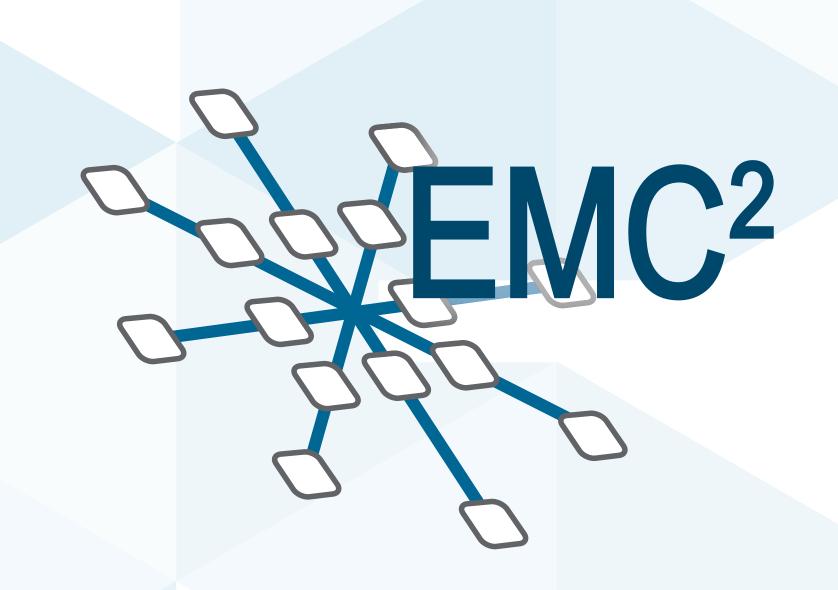
The EMC² project expests to facilitate the EU's ability to deploy and use Embedded Systems across important European market sectors:

- > Automotive: Embedded Systems are the key innovation driver, enabling the majority of innovations.
- Avionics: main challenges are related to the acceleration of technology cycles and cost of software development.
- Space: main challenges are related to the increase of performance/weight ratio, high reliability and long lifetime.
- Industrial control and factory automation: the key areas will be energy efficiency and sustainability.
- Healthcare: challenges are related to workflow efficiency, integration of diagnosis and treatment, quality assurance.
- Internet of Things: the increased amount of data available, as well as safety and security issues, will need to be processed.

TECHNICAL innovation

ABB AB

- > Cost of the system design: EMC² multi-core architecture, with its development ecosystem of improved programmability, dynamic runtime environment and tool support, eases design and analysis.
- > Effort and time required for revalidation and recertification of systems after making changes: through architectural support for mixed-critical applications, the early consideration of non-functional properties and the holistic integration of development and validation/certification activities in the EMC^2 nteroperability framework.
- Management of increased complexity: EMC² multi-core architecture and the development ecosystem reduce software complexity and leverage the benefits of module consolidation.
- > Cross-sector reusability of Embedded Systems devices and architecture platforms: through crosssector embedded hardware architecture including a dynamic runtime environment.



PROJECT COC	RDINATOR	START	
 Werner Wel	oer	1 April 2014	
 INSTITUTION		DURATION	
 Infineon		36 months	
 EMAIL		TOTAL INVESTMENT	
 werner.web	er@infineon.com	€ 93.92 m	
WEBSITE		PARTICIPATING ORGAN	IISATIONS
 www.artem	nis-emc2.eu	100	
		NUMBER OF COUNTRIE	
 		16	

Aicas GmbH Airbus Defence and Space GmbH -Cassidian Airbus Defence and Space GmbH - EADS Alenia Aermacchi S.p.A Alten Sweden AB ArcCore AB Arcticus Systems AB Austrian Institute of Technology AVL List GmbH **AVL Software and Functions GmbH** Blueice BVBA

BMW AG Brno University of Technology CEA

Chalmers University of Technology Consorzio Interuniversitario Nazionale per l'Informatica CRF, Centro Ricerche Fiat **Critical Software**

Danfoss Power Electronics A/S Denso Automotive Deutschland GmbH **Elektrobit Automotive GmbH** EnSilica **ERICSSON AB**

eVision Systems GmbH

Fornebu Consulting AS Fraunhofer IESE Freescale Semiconductor Czech Republic Frequentis AG Harokopio University of Athens

INESC ID Lisboa Infineon Technologies AG Infineon Technologies Austria AG Infineon Technologies UK Ltd **INRIA** Institute of Microelectronic Applications

HI-Iberia Ingenieria y Proyectos

s.r.o. Instituto Superior de Engenharia do Porto Thales Austria GmbH

Instituto Tecnológico de Informática Integrasys S.A. Ixion Industry & Aerospace SL

Kompetenzzentrum - Das virtuelle Fahrzeug, Forschungsgesellschaft GmbH KTH Royal Institute of Technology Lulea University of Technology Magillem Design Services MBDA Italia S.p.A. **NXP Semiconductors** NXP Semiconductors Germany GmbH **OFFIS** Philips Medical Systems Nederland B.V. Politecnico di Torino **Quobis Networks SL** Riga Technical University **Rockwell Collins France** SELEX ES S.p.A. Seven Solutions S.L. Siemens AG SILKAN S.A. Simula Research Laboratory AS

Stichting Imec Nederland Sundance Multiprocessor Technology Ltd Swedish Institute of Computer Science AB SYSGO AG Sysgo s.r.o. **Systematic** Systemite AB **Systonomy Limited Technical University Eindhoven** Technical University of Denmark Technische Universität Braunschweig Technische Universität Dortmund Technische Universität Kaiserslautern Technische Universität Wien Technolution B.V. **TECNALIA** Telvent Energia SA

Test and Verification Solutions

Thales Alenia Space Italia

Thales Alenia Space Spain

Thales Avionics SAS

& Security SAS

Thales Communications

Ltd

Universita degli Studi dell'Aquila Universita degli Studi di Genova University of Bristol University of Oslo University of Technology Delft AV ČR, v.v.i. Vector Fabrics B.V. Visure Solutions S.L. Volvo Technology AB WesternGeco AS

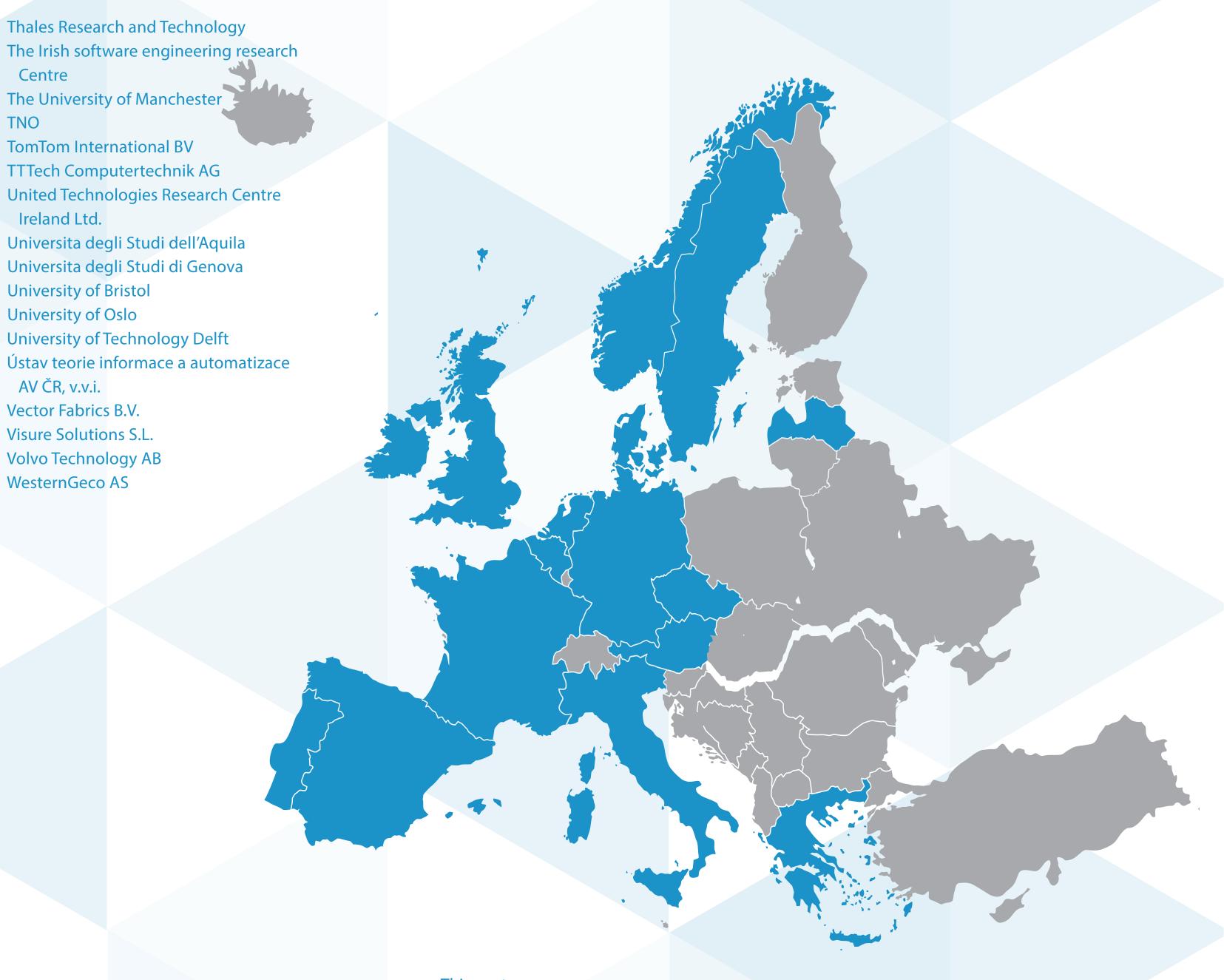
Centre

Ireland Ltd.

The University of Manchester

TTTech Computertechnik AG

TomTom International BV



This poster: EMC2 project ARTEMIS/0001/2013 - JU grant nr. 621429 Co-financed by:







