CISTER Participation in European Projects

The projects SafeCOP and ENABLE-S3, approved in the last ECSEL JU 2015 call, are now in the grant preparation phase and are expected to start in May 2016.

ENABLE-S3 aspires to substitute today's cost-intensive validation and verification efforts by virtual and semi-virtual testing and verification, coverage-oriented test selection methods and standardization to pave the way for efficient development of highly automated and autonomous systems. CISTER will participate in the requirement specification and implementation of three usecases (automotive, avionics, farming). The center will conduct studies to identify potential security and safety threats caused by unexpected non-functional, real-time behaviours, and develop supporting software toolboxes. It will also implement Runtime Verification components, and implement automated analysis tools for detecting the threats identified. Partners include major industrial partners such as AVL, Airbus, Renault, Toyota, Siemens and local partners GMV.

SafeCOP addresses safety-related cooperating cyber-physical systems, characterised by use of wireless communication, multiple stakeholders, dynamic system definitions and unpredictable operating environments. CISTER will evaluate adequacy of COTS and standard wireless technologies, extend current wireless protocols for safe and secure cooperation and work on cooperative cruise control algorithms for platooning. It will also develop a multi-robot testbed for testing these algorithms for the vehicle platoon and bed transportation usecase. SafeCOP partners include Thalys, SINTEF, KTH, SICS and local partners GMV and Tekever.

CISTER-led European Project meets at HiPEAC 2016

P-SOCRATES (Parallel SOftware framework for time-CRitical mAny-core sysTEmS), is an European project led by CISTER aiming to develop new techniques for exploiting the massively parallel computation capabilities of next-generation many-core embedded platforms in a predictable way.

During the last conference of the European Network of Excellence on High Performance and Embedded Architecture and Compilation (HiPEAC 2016) the P-SOCRATES consortium organized a technical meeting and a public workshop.

The workshop (4th Workshop on High-performance and Real-time Embedded Systems - HiRES 2016) co-located with the 2nd DreamCloud (Dynamic Resource Allocation and Management in Embedded, High Performance and Cloud Computing) workshop, included presentations of ongoing work and preliminary results, as well as invited talks from Prof. Akash Kumar (TU Dresden, Germany) and Dr. Gerard Rauwerda (co-founder and CTO of Recore Systems, the Netherlands).

The P-SOCRATES technical meeting had the dual purpose of preparing the work for a successful 3rd milestone of the project, as well as to prepare the forthcoming meeting with the project Advisory Board, which includes representatives from leading European companies, such as Airbus Defense and Space (France), Airbus Innovation Group (Germany), Bosch (Germany), Expert Systems (Italy), Honeywell (Czech Republic), MBDA (Italy), Saab (Sweden), Kalray (France) and Rapita Systems (UK).

New Initiatives

Notably, in the past weeks, CISTER participated in partnership with two Portuguese Companies in two ESA (European Space Agency) tenders and was one of the key partners in a SPIRE call in the area of factory automation.

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ACHIEVEMENTS IN ACADEMIA

Multiple PhDs from CISTER's ranks

During the past four years, over ten PhD students at CISTER successfully concluded and defended their PhD degrees. This is a tremendous success for the strategy put forward to promote a world-renowned program, which was able to attract students from all continents. CISTER graduates are now researchers and professionals both in the academia (at CISTER/ISEP and MDH, Sweden) and relevant international industry such as HP (Spain), Bosch (India) or Xerox (India).

In the last month two additional PhD students, Maryam Vahabi and Ricardo Garibay, completed their PhD programmes with success, reinforcing the position of CISTER as a leading national research center with the unquestionable capacity to graduate highly skilled researchers in the area of real-time and embedded computing.

Maryam Vahabi

Maryam Vahabi has successfully defended her PhD Thesis at the Faculty of Engineering of University of Porto, Portugal. The Thesis, entitled "Computing Aggregate Quantities in Large-Scale and Dense Sensor Networks", proposes a set of technologies and methodologies that enable extracting certain features of a physical phenomenon monitored by a dense sensing network in a timely and reliable manner.

The jury was composed of José Alfredo Ribeiro da Silva Matos (FEUP, representing the Rector), Leandro Buss Becker (UFSC, Brazil), Nicolas Navet (University of Luxembourg, Luxembourg), Manuel Alberto Pereira Ricardo (FEUP), Paulo José Lopes Machado Portugal (FEUP), and his supervisor Eduardo Tovar (CISTER/ISEP).

Ricardo Garibay

Ricardo Garibay-Martínez has successfully defended his PhD thesis, entitled "A Framework for the Development of Parallel and Distributed Real-Time Embedded Systems", at the Faculty of Engineering of University of Porto (FEUP), Portugal. His PhD thesis proposes a design framework that allows for the integration of parallel distributed models in real-time embedded applications.

The jury was composed of José Alfredo Ribeiro da Silva Matos (FEUP, representing the Rector), José Javier Gutiérrez (University of Cantabria, Spain), Paulo Pedreiras (University of Aveiro, Portugal), Luis Almeida (FEUP, Portugal), Mário Sousa (FEUP), and his supervisor Luis Lino Ferreira (CISTER/ISEP, Portugal).

ACTIVITIES IN THE CENTER

CISTER hosted two Distinguished Seminars

During the past month CISTER/INESC-TEC received the visit of two international researchers, Professor Leandro Buss Becker and Professor J. Javier Gutiérrez, with the goal of strengthening networks and collaborations.

During his visit, Professor Leandro Buss Becker took the opportunity to give a distinguished series seminar on “Model-Driven Engineering of Cyber-Physical Systems”. During his talk, he addressed some fundamental issues related to the development of functional models, used for simulation purposes in Cyber-Physical Systems (CPS).

During the visit of Professor J. Javier Gutiérrez, he took the opportunity to give a distinguished series seminar on "The event-driven approach in the development of distributed real-time systems". During his talk, he addressed some of the main schedulability analysis and optimization techniques for distributed real-time systems, together with the modeling framework MAST (Modeling and Analysis Suite for Real-Time Applications) and its integration in a Model-Driven Engineering (MDE) strategy.

Mailing Adress
CISTER/ISEP
Rua Dr. Ant. Bern. Almeida 431
4249-015 Porto

Building Adress
CISTER Research Centre
Rua Alfredo Allen 535
4200-135 Porto

+351 228 340 502
www.cister.isep.ipp.pt
cister-info@isep.ipp.pt
41.1779,-8.6058

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Celebrating 4 years of CISTER facilities

This February we are celebrating 4 years since CISTER researchers moved to the new Building at Rua Alfredo Allen. While this has been a tremendous logistical and financial effort by C-ISTER and the hosting and managing institutions, it has also been fundamental to achieve outstanding objectives in terms of research, transferring knowledge to the industry and the society, and advanced training of both PhD and undergrad students. It is remarkable that these objectives were attained during a harsh and long period of insufficient support to science and that simultaneously the resilient team of CISTER’s researchers was able to keep in the front-end of science production in the increasingly important area of embedded computing and cyber-physical systems.

CISTER is unarguably one of the international leaders in these areas of science and technology, and has been able, in the past 4 years, to develop another important pillar of its mission by fostering and developing a strong ecosystem of industry driven projects, activities and partnerships, in which we include a large set of important international and national players. In

the past 4 years, CISTER was involved in more than 40 international initiatives in collaboration with more than 20 Portuguese companies such as Critical Software, GMV Skysoft, Portugal Telecom, Tekever, Isa Energy, Edisoft, Evoleo, EFACEC, Adira, Critical Materials, Critical Manufacturing, Embrear Portugal, Petrogal, Galp Energia, Thales Portugal, Freedom Grow, Kinematix, INOVA+, MicroIO, Ubiwhere, Porto Digital, etc.

Together with national industries we are now nurturing the concept of a centre of excellence and tech transfer in critical embedded computing systems, to be formally setup in the forthcoming weeks.

The conditions are set to allow the required stability and support to keep the sustainable growth and path of CISTER, the hosting and managing institutions and the national industry in the area.

CISTER to host RTSS 2016

RTSS PORTO 2016

CISTER/INESC-TEC is proud to organize in collaboration with Instituto de Telecomunicações (IT) the world renowned IEEE Real-Time Systems Symposium (RTSS), Nov-Dec. 2016, in Porto. The RTSS series is the premier conference in the area of real-time systems, and provides a forum for the presentation of high-quality, original research covering all aspects of real-time systems design, analysis, implementation, evaluation, and experiences.

The organization of RTSS 2016 is the culmination of a year where CISTER’s researchers once again have a prominent and scientific leading role on highly-relevant international scientific events, namely, as program co-chair of the 21st International Conference on Reliable Software Technologies (Ada-Europe 2016), to be held in Pisa, Italy, program co-chair of the 22nd IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA 2016), to be held in Daegu, South Korea, program co-chair of the 24th International Conference on Real-Time Networks and Systems (RTNS 2016), to be held in Brest, France, program co-chair of the 7th International Real-Time Scheduling Open Problems Seminar (RTSOPS 2016), to be held in Toulouse, France, and program chair of the WiP at 22nd IEEE Real-Time Embedded Technology & Applications Symposium (RTAS 2016), to be held in Vienna, Austria.