CISTER Quicknews

progress in projects

KHRONOSIM PROJECT KICKS OFF

CISTER is a partner of the recently approved KhronoSim project, in the framework of Portugal 2020 Program, that kicked-off this September 30th, in Coimbra.

KhronoSim aims at developing a platform for testing cyber-physical systems in closed-loop, that is modular, extensible and usable in multiple application domains.

Featuring hard-real-time control, enabling the integration of simulation models to build a closed loop test environment and allowing the use of physical and virtual systems alike.

KhronoSim

The two year project is led by Critical Software and includes CISTER and the Department of Electrical and Computer Engineering of the University of Coimbra (DEEC-UC).

CISTER's role will be in the embedded real-time domain, in particular the challenges of testing and simulating multicore platforms.

MANTIS REACHES FIRST MILESTONE
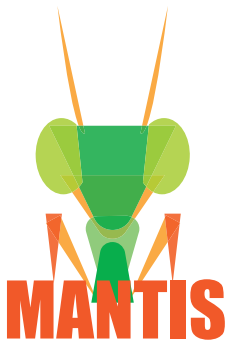
MANTIS

The MANTIS project first milestone has been successfully reached. Up to this milestone, CISTER was able to deliver a middleware for CNC machine monitoring, capable of making available data from the machine internal sensors and from sensors specific for pro-active maintenance. This last type of sensors can be added to high end machines to detect condition like the presence of metal in machine lubricant and abnormal vibration on the machine. The existence of these conditions enables the MANTIS system to predict failure and determine the root cause of failure, among other functionalities. The overall MANTIS also passed successfully its first project review meeting.

ARROWHEAD PROJECT IS COMING TO A SUCCESSFUL END

During the last 4 years CISTER resarchers have been envolved in Arrowhead project. The main objective was to provide a Service Oriented Approach (SOA) to Embedded Systems by both streamlining the design of services, and providing a framework to support service development.

In the development of the Arrowhead framework, CISTER was responsible for creation of a software engineering methodology capable of supporting design and documentation of artefacts in embedded SOA systems, and was also responsible for the design and implementation of the flex-offer concept, which is applied to the trading of energy by Internet of Things (IoT) devices, like industrial machines, heating systems, household appliances, and others.

During the last 9 months of the project there was also a very fruitful collaboration of 4 undergraduate students from the department of informatics of ISEP. They have been involved in the successful development of two Arrowhead Core systems: the QoS Manager and the Event Handler. The Event Handler is a REST-based application to distribute and filter messages, and delivering them to consuming applications. The QoS Manager is a generic framework, which can be applied on multiple IoT environments, providing its applications with capabilities of handling several QoS parameters and, at the same time, monitor any failures which can occur, distributing failure information by means of the Event Handler systems.

CISTER Quicknews

ISO/IEC JTC 1/WG7 MEETING HELD IN CHINA

The city of Chongqing in China hosted the 14th meeting of the ISO/IEC JTC 1/WG7 working group. The meeting was sponsored by the Chongqing University of Posts and Telecommunications. This working group is in charge of the standardization activities of wireless sensor networks, and has liaisons with other working groups and standardization groups related to Internet of things (IoT) and machine to machine (M2M) communications. In this meeting, members discussed editorial and technical comments to the new standard on under water acoustic sensor networks (UWASN) proposed by South Korea. There were also several action points on the testing framework for wireless sensor networks proposed by China, and new topics with big data proposed by Finland.

CISTER acts as the liaison partner between the DEWI project and the ISO/IEC JTC 1/WG7 and was represented by Ramiro Sámano Robles. DEWI will be producing technology reports based on the use cases of the industrial domains in the project. These technology reports will be subjected to comments and voting from the ISO committee members. The meeting in China was used to receive technical and editorial comments on the first DEWI technology report on active flow control for aeronautics applications. The ISO meeting was preceded by a one-day workshop hosted by the Chongqing University of Posts and Telecommunications. CISTER presented the general overview of the aeronautics use case on active flow control for skin drag reduction.

ICT PROPOSERS DAY 2016

CISTER researcher Luis Miguel Pinho participated in the ICT Proposers' Day 2016, an event that took place in Bratislava, Slovakia on 27th and 28th September 2016 to promote European ICT Research & Innovation, focusing on the Horizon 2020 Work Programme for 2017.

The event offered an exceptional opportunity to build quality partnerships as it connected academia, research institutes, industrial stakeholders, SMEs and government actors from all over Europe. Several thousand participants discussed the 2017 ICT project calls, including topics in Leadership in Enabling and Industrial Technologies, such as low-power embedded computing, big data research, internet of things, and in Societal Changes, such as energy efficiency and smart cities.

During the event Miguel also participated in several meetings related to the ongoing initiatives targeting some of the calls of the work program, also taking the opportunity to discuss and clarify with European Commission and Portuguese officials the Work Programme.

CISTER SUCCESSFUL IN ECSEL CALL

CISTER has received preliminary information on the ECSEL 2016 call with two proposals, SCOTT and Productive 4.0, favorably evaluated by the Joint Undertaking (JU).

SCOTT, or Secure Connected Trustable Things, will provide comprehensive cost-efficient solutions of wireless, end-to-end secure, trustworthy connectivity and interoperability to bridge the last mile to the market. SCOTT bundles the European key players from several industrial domains including building and home / smart infrastructure, automotive, aeronautics, rail, and health to make full potential of cross-domain synergies and to strengthen Europe's position in the emerging technology field of secure Internet of Things (IoT).

Productive 4.0 will take a step forward towards a hands-on approach and practical implementations focusing on three main product lifecycle pillars of Digital Production (DP), Supply Chain Networks (SCN) and Product Lifecycle Management (PLM).

The results, such as IoT components modelling and simulation methods as well as toolchains for cross-lifecycle and cross domain digitization, will be suitable means for linking all stages of a product lifecycle.

achievements in academia

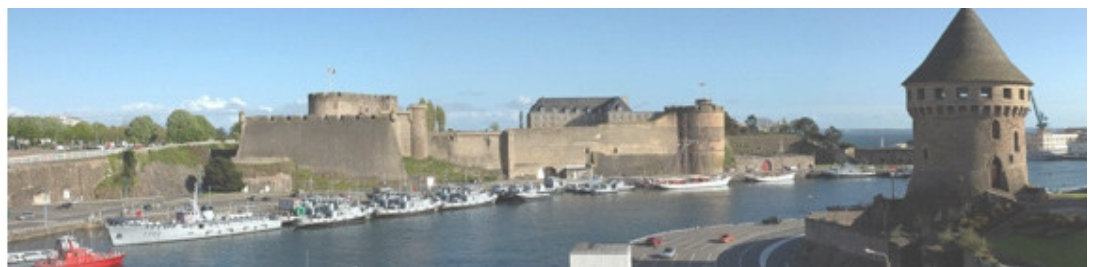## CISTER RESEARCHER PROGRAM CO-CHAIR AT RTCSA

The 24th International Conference on Real-Time Networks and Systems (RTNS 2016) took place this October 19-21th, in Brest, France. RTNS is a friendly conference with a great sense of community, where cutting edge research is presented in the areas of real-time system design and analysis, infrastructure and hardware for real-time systems, software technologies for real-time systems and emerging applications.

CISTER researcher Luis Miguel Pinho was Program Co-Chair of the conference, together with Sébastien Faucou from Université de Nantes, France. The conference featured a rich 3-day technical program, with 34 papers split in 10 sessions, coming from a record number of submissions at RTNS.

Highlights of the conference was the keynote talk by Sebastian Fischmeister, University of Waterloo, Canada, on "Time-aware Instrumentation: From the Formal Model to Applications"; the 10th Junior Researcher Workshop on Real-Time Computing; and, for the first time at RTNS, an Artifact Evaluation process, an increasingly important requirements for research results.

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The conference was both a technical and networking success, blessed by sunny days in Brest, a rare occasion at this time of the year.

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activities in the centre

NEW VISITING PHD STUDENT AT CISTER

Fernando Silvano Gonçalves, a PhD student from the Automation and Systems Engineering Department of the Federal University of Santa Catarina, in Brazil, is visiting CISTER.

Fernando works under the supervision of Leandro Buss Becker, and during his visit he will be collaborating with CISTER researchers Eduardo Tovar and David Pereira. The focus of work is on the subject of formal verification of model-driven Cyber-Physical Systems design, namely, on exploring approaches based on Runtime Verification and Model Checking to improve the robustness and reliability of a framework that he is currently developing.

Fernando received his BCS from University of Southern Santa Catarina (UNESC), Brazil, M.Eng. in 2012 from Federal University of Santa Catarina (UFSC) Brazil.

He is now a PhD student at Automation and Systems Engineering Department (DAS) from UFSC. He has worked with Unmanned Aerial Vehicles (UAVs) design, especially with the development of complex embedded systems, at DAS from UFSC.

During this time, he worked on the PROVant project, which designed autonomous bi-rotors UAVs. His research interests include Model-Driven Design, system verification, Cyber-Physical Systems, real-time systems and embedded systems.

Welcome Fernando!

THE RETURN OF A PAST MEMBER AND OTHER CISTER GRADUATES MOVING ON
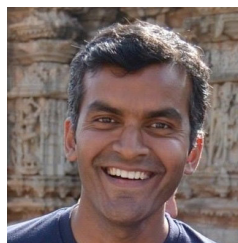
We warmly welcome Gurulingesh Raravi back to CISTER as a new Research Associate.

Before joining the Centre, Gurulingesh worked at Xerox Research Centre India for two years focusing on designing solutions for smart mobility and retail systems and for service delivery organizations. In 2014, he received his PhD with the highest honors from University of Porto for his work on "Real-Time Scheduling on Heterogeneous Multiprocessors", under the supervision of CISTER researcher Vincent Nélis. Gurulingesh's research interests are mainly in the automotive and telecommunications domains.

Other CISTER PhD graduates have also found new positions.

Congratulations to Artem Burmyakov, who has joined the Seoul National University as a Postdoctoral Associate; Dakshina Dasari, who has joined Bosch Germany; and Claro Noda, who has joined Mid Sweden university as a Postdoc Researcher. We wish them success in their new career.

ANOTHER SEASON OF THE PERIODIC SEMINAR SERIES BEGINS

Communication between researchers is fundamental to the scientific process.

After the success of the previous years, CISTER continues another season of Periodic Seminar Series to foster collaborative work and encourage exchange of ideas between researchers. The kick-off talk on "Energy-balancing Packets Scheduling for Airborne Relaying Networks" was delivered this September by Kai Li, a research scientist who recently joined CISTER.

During this talk, Kai presented airborne relaying as a promising candidate for extending wireless sensor networks (WSN) to human-unfriendly terrains.

The talk spurred a lively discussion on its applicability for various use cases. Over the course of the year, CISTER will also invite renowned scientists from other national research groups working in the same areas to share their latest findings ■

We're on