

# CISTER Quicknews

MAY 2016

## PT2020 PROPOSAL DSGRID ACCEPTED



CISTER's efforts in the preparation of PT2020 proposals has started to show results with the approval of the DSGrid proposal. The objective of the DSGrid project is to deliver new scientific and technical knowledge, new engineering skills and new products towards the establishment of third generation automation systems for substations and similar applications.

It is set in the current development trend where the concepts of smarter transmission and distribution grids are delivering an answer to the challenges of energy efficiency, quality of power supply and lifecycle operational optimization of grid assets and systems.

The project is owned by EFACEC with important contributions by EDP Distribuição, ISEP (through CISTER) and the University of Minho (through HASLab). CISTER will be central in the innovations related to embedded systems and to provide tools and analysis related to systems' temporal properties. In meanwhile, collaborations of CISTER with EFACEC on related topics were discussed during an informal visit of CISTER researchers Eduardo Tovar and Jibrán Ali to the EFACEC premises in Maia last May 27.

### *CISTER in collaboration with EMBRAER*

EMBRAER is a global key player in the aeronautics industry with whom CISTER already has a considerable history of successful collaborations.

CISTER researcher Eduardo Tovar participated in several meetings with various EMBRAER colleagues at EMBRAER

premises in São José dos Campos in Brazil, to further detail an ongoing framework of collaboration aiming at developing novel avionics, which according to EMBRAER colleagues and CISTER researchers has the potential to make history in the avionics sector. Besides the very fruitful technical discussions with our good colleagues Sérgio Penna, Parizi Negrão and Luciano Pedrote, the visit to São José dos Campos also provided the opportunity to visit a magnificent site where thousands

### *CISTER participates in ECSEL call*

CISTER had five successful submissions in the currently concluded project outline phase of the ECSEL 2016 call. These proposals were for the Research and Innovation actions as well as the Innovation actions of the call topic "Key Applications and Essential Technologies". The participating partners from Portugal included public bodies, SMEs and LEs. ECSEL is an important EU initiative that focuses on industrial research of important value to society and Portugal in particular. CISTER promoted a meeting in Lisbon, on May 13, of likeminded institutions and companies from Portugal along with ECSEL JU representatives to discuss current and future participation in these initiatives.

### *GMV visits CISTER*

CISTER has already a long history of collaborations with GMV Portugal, in particular its Homeland Security and Defence Division. On the 12th of May, CISTER hosted a meeting with another division of GMV Portugal, Transport and Mobility, to explore new collaboration opportunities. GMV is a leader in solutions for aerospace and transportation industry, which

constitutes an important strategic sector for CISTER. During the meeting, tasks on the joint use case implementations in the ongoing ECSEL projects SafeCOP and ENABLE-S3 were also discussed. GMV personnel Bruno Gonçalves and Paulo Gomes (Head of Road & Automotive Section - Transport & Mobility) also familiarized themselves with CISTER's facilities and CISTER's CITech - Industry Transfer Center, where several demonstrators were shown.

### *Arrowhead Project progresses*

Recently, a General Meeting of the Arrowhead project took place at the High Speed Sustainable Manufacturing Institute, London. Arrowhead is the European effort to apply the Service Oriented Approach (SOA) to Embedded Systems by both streamlining the design of services, and providing a framework to support service development. The Arrowhead project is now in its last year. The meeting had the twofold goal of enabling demonstrators' owners to use the capabilities of the current implementation of the Arrowhead Framework, and to discuss the evolution of the framework. CISTER work is converging on extending the publish/subscribe paradigm to SOA, and on QoS-as-a-Service. Michele Albano represented CISTER in the meeting and led the session on QoS. The discussion considered how QoS can be applied to orchestrate services in a local cloud, and the Arrowhead partners agreed on CISTER's proposal for an architecture supporting the QoS functionalities. Later, the discussion came to a novel topic, QoS for distributed systems obeying the "cloud of clouds" design, and the Arrowhead partners will be driven by CISTER while investigating this new research line.

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## VISIT OF COLLABORATORS FROM LULEA UNIVERSITY OF TECHNOLOGY

Researcher Per Lindgren from Lulea University of Technology (LTU) is back to CISTER until the end of July to continue the collaboration on topics covered in the project EMC2.

Per Lindgren is a chaired professor in Embedded Systems at EISLAB, Sweden, and manages the Sustainable IT systems Master's (SITS) program. He is a member of the ARTES++ reference group, and member of the ARTEMIS



During this month, CISTER hosted researcher Marcus Lindner, also from LTU.

Marcus Lindner is pursuing his PhD under the supervision of Per Lindgren. His field of research is embedded systems with a focus on reliable and verifiable software with real-time support. During his stay, Marcus gave a seminar entitled "Robust Industrial Automation Software: outsets for non-determinism and real-time execution" where he presented software related issues and focused on selected properties, which are important for software development to improve the robustness of industrial automation software. Also during his stay, Marcus actively collaborated with CISTER researchers Luís Miguel Pinho and David Pereira in the topic of formal verification of industrial automation applications, with particular focus on the verification of the IEC 61499 standard.



Architecture group, having contributed to the ARTEMIS Strategic Research Agenda (SRA), section on Design Methods, Tools, Virtual Engineering.

Among the many topics that LTU and CISTER have been working together, there is an active collaboration in the definition of curricula for subjects related to the construction of certified compilers for embedded systems software development, as well as deductive approaches to the formal verification of uni-processor scheduling algorithms.

## CISTER RESEARCHER INVITED LECTURER AT FCUP

On the 13th of May, CISTER Researcher David Pereira lectured a seminar entitled "Runtime Verification of Real-Time Systems: Logics and Architectures" in the scope of the seminar series "Seminar on Semigroups, Automata and Languages", organized by the Center of Mathematics of the Faculty of Sciences of the University of Porto (FCUP), where he presented the recent results in the field of formal verification of real-time embedded systems. These results refer to the ongoing joint work between CISTER members Luís Miguel Pinho, David Pereira, Geoffrey Nelissen, André Pedro, and former Master Student intern Sangeeth Kurunathan. On the 24th of May, David Pereira gave a lecture on the introduction to program verification using the Coq proof assistant in the scope of the Formal Software Verification class that is part of the curricula of the Master's Degree program offered by the Computer Science Department of FCUP. In both of these activities, David Pereira had also the chance to discuss potential collaborations between CISTER and member of this department in the specific topics of formal verification of real-time embedded systems.

## CISTER RESEARCHER INVITED SPEAKER AT CONFERENCE

CISTER Researcher Luis Lino Ferreira was one of the invited speakers at the Industry Day held in conjunction with the 12th IEEE Conference on Factory Communication Systems (WFCS).

The Industry Day of WFCS 2016 had other exciting talks by various industrialists representing key companies and industrial organizations such as EFACEC, Brisa, EtherCAT, Wavecom or Veniam. Luis Lino Ferreira provided an overview of the ongoing work at CISTER aiming at developing innovative research on IoT technologies targeting factory automation scenarios and the Industry 4.0. A view on the main results and experiences coming from the European-wide strategic R&D projects Arrowhead and MANTIS, in which CISTER has relevant roles, was also conveyed to an audience of over 60 participants, mostly of them coming from the industry. Worth to note that Luis Lino Ferreira will act as Program Co-Chair for the 13th IEEE WFCS, that will take place in Trondheim, Norway.

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