CISTER Quicknews
MARCH 2016

## CISTER Progress in Projects

### *Collaboration between Arrowhead and MANTIS ECSEL projects*

The Arrowhead project regards applying a Service Oriented Architecture (SOA) approach to the Internet of Things (IoT) of the Factories of the Future. This project is now on its 4th and final year, and one of its main achievements is precisely the Arrowhead Framework for IoT automation applications, where CISTER researchers are now proactively nurturing the application of the Arrowhead Framework into MANTIS. In the last general meeting of the MANTIS project, that took place last February at Caparica, Portugal, CISTER researchers Michele Albano and Luis Lino Ferreira described and presented the Arrowhead framework and how it could be reused on the MANTIS architecture to allow an efficient design of the interaction between the embedded devices and the clouds (where data from machinery sensors is to be analysed).

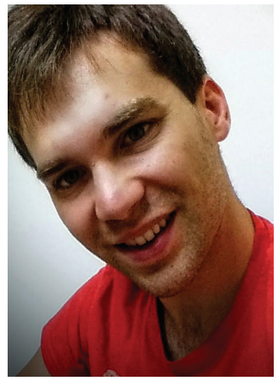
CISTER researchers have been contributing important skills.
CISTER is also deeply involved in the younger (now on its 9th month) ECSEL MANTIS project, which targets proactive maintenance of industrial machines and systems, using an IoT approach.

### P-SOCRATES showcases results to the industrial advisory board

The P-SOCRATES project, an H2020 international project led by CISTER, is a 3-year initiative that fosters the convergence of High-Performance Computing and Embedded Computing domains. The project aims at developing an execution environment able to deliver high throughput, making it suitable for computationally-intensive applications, but also a predictable throughput, so that guarantees can be provided on the responsiveness on the software functionality. The project is now entering its last phase during which all the individual components are to be assembled.
On the 4th of March, the technical leaders presented to the Industrial Advisory Board their individual advancements regarding the tools and techniques developed in the project. The IAB gathers representatives of companies including Airbus, Bosch, Saab, Honeywell, and Kalray. Their feedback was as positive as it was encouraging. Discussions are already going on about an eventual integration of some of the components of the project into their flagship products. The meeting was held in Madrid with the participation of CISTER's researchers Miguel Pinho (project coordinator) and Vincent Nélis.


## VISITORS IN THE CENTER

Mohamed Ghazi Amor, Masters student from the National Institute of Applied Sciences and Technology, Tunisia, is visiting CISTER this spring. He will be investigating the integration of cloud computing systems with IoT for large-scale smart city applications in collaboration with CISTER researchers Anis Koubaa and Eduardo Tovar.



Davide Compagnin, a PhD student from the University of Padua, Italy working with Tullio Vardanega, is visiting CISTER. During his visit, he will collaborate with CISTER researchers Luis Miguel Pinho and Cláudio Maia, on the design of an efficient library for the parallelization of lightweight tasks targeting the Kalray architecture.

## *CISTER hosts ISO/IEC working group meeting*

The ISO/IEC JTC1 working group on sensor networks (WG7) met at CISTER in March. ISO/IEC JTC 1/ WG 7 Sensor Networks (WGSN) is a standardization working group of the joint technical committee ISO/IEC JTC 1 of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), which develops and facilitates standards within the field of sensor networks. The meeting in Porto addressed several issues of different documents that will complement and/or extend the original reference architecture standard. The main intention of the standardized architecture and interfaces is to achieve interoperability between different sensor networks from different manufacturers and with different requirements.

The participants included Yongjun Kim from Modacom (Chair of WG7), Korea, Jooran Lee from Korean Standards Association (Secretary of WG7), Hao Wang and Haofei Xie from the Chongqing University of Posts and Telecommunications, China, Hong Kou from the China Electronics Standardization Institute, Soohyun Park and Sooyoung Shin from Kookmin University, Korea, and Arto Toppinen and Seppo Karjalainen from Savonia, Finland. CISTER researchers Ramiro Robles, Ricardo Severino and Eduardo Tovar also participated in the meeting.

Contributions from the DEWI project were also discussed during the meeting. The DEWI project on Dependable Embedded Wireless Infrastructure is developing an architecture for a "sensor & communication bubble" enabling less expensive and more flexible maintenance and re-configuration. The DEWI architecture is fully ISO-compliant and can therefore become an excellent example of the implementation of industrial wireless sensor networks based on the ISO reference architecture. CISTER is the leader of the work package on the aeronautics usecase in DEWI.

The next meeting of WG7 will take place in China later this year.

**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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## Visit to CISTER by the Minister of Science, Technology and Higher

Prof. Manuel Heitor, the Minister of Science, Technology and Higher Education, visited CISTER as part of his tour to some of the R&D centres and units of the Polytechnic of Porto.

The visit was an opportunity for the new Minister to get up-to-date with the cutting edge research in real-time and embedded computing systems that is currently undergoing at CISTER. He visited CISTER's facilities with a particular focus on visiting and getting acquaintance with the large amount of industry driven projects and industrial partnerships that are being promoted at CISTER, including the CITECH initiative that is being nurtured in cooperation with Portuguese key industrial players in the area of critical computing systems for aeronautics and aerospace, automotive, e-health, and other application domains where knowledge on cutting-edge real-time and embedded computing is a critical asset.


The visit to the CISTER facilities was organised by the Polytechnic of Porto and included the President of the Polytechnic of Porto, Prof. Rosário Gambôa, the President of ISEP, Prof. João Rocha and many other key dignitaries of ISEP and the Polytechnic of Porto but also from other schools of the Polytechnic of Porto, notably ISCAP, ESE, ESMAE, ESEIG, ESTGF, ESTSP.

## CISTER successful in ITEA call

CISTER achieved further success with the ESTABLISH proposal getting the label in the ITEA 3 call.

ITEA is the EUREKA Cluster programme supporting innovative, industry-driven, pre-competitive R&D projects in the area of Software-intensive Systems & Services (SiSS). ITEA stimulates projects in an open community of large industry, SMEs, universities, research institutes and user organisations.

The objective of ESTABLISH is to convert environmental (sensor) data into actionable information for users to provide a healthier and safer environment thereby improving the quality of life. Smart adaptive services providing real time feedback tailored to specific user and application needs will be developed by combining networked sensors and other data sources with adaptive models in a non-predefined manner. In this way, ESTABLISH closes the complete chain from sensor to application: collecting, enriching, interpretation, extrapolation and feedback.

ESTABLISH will lead to a wide range of new services and products that are all based on environmental sensors like optimized city and mobility planning, developing smart HVAC systems that ensure a healthy indoor environment and promoting independence of specific vulnerable groups.

The ESTABLISH consortium consists of partners from 11 countries including KPN, AllThingsTalk, ETRI, VTT and TNO. The Portuguese partners include IncreaseTime, Intellicare, Inova+ and the City of Penela. CISTER researcher Raghuraman Rangarajan is the lead coordinator for ISEP.