

# CISTER Quicknews

JUNE & JULY, 2017



**CISTER** - Research Centre in  
Real-Time & Embedded Computing Systems



Instituto Superior de  
Engenharia do Porto

**P.PORTO**



## CISTER IS PARTNER OF THE NEWLY APPROVED 48MEUROS K2 DIGITAL MOBILITY PROJECT

The importance of digitalization in the industry has grown significantly in the last ten years. The shift towards a connected vehicle and a digital vehicle value chain with new business models has consequently given rise to new demands in development technologies. These demands will lead to the evolution of the currently adopted state-of-the-art processes, methods, and tools used in vehicle development.

The following megatrends are emerging as driving forces:

- 1) Advanced driver-assistance systems, active safety, and automated driving and comfort;
- 2) Electrification to reduce CO2 emissions;
- 3) Connectivity and integration with the Internet of Things;
- 4) Advanced security due to the increasingly connected and software-connected world.

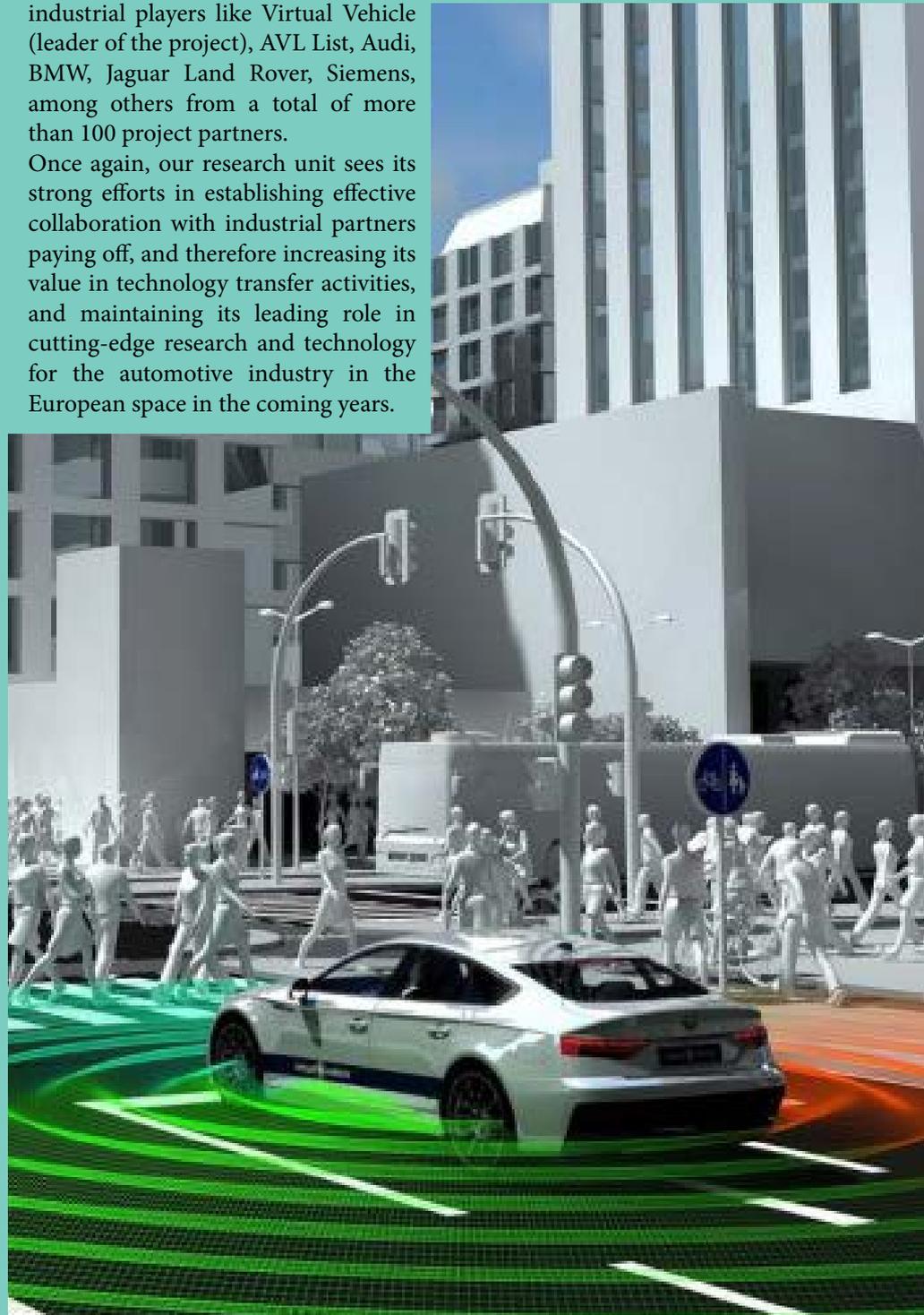
Addressing these automotive industry challenges was the topic of the 10th Graz Symposium Virtual Vehicle that took place in Graz, Austria, in June. The highlight was the K2 Digital Mobility - Context-Embedded Vehicle Technologies project, approved by the Austrian government and funding agencies.

The new COMET K2 Excellence Research Programme driven by Virtual Vehicle Research Center will start in January 2018. A total project volume of € 48 million until 2021 is expected, and CISTER/ISEP is one of the partners.

Researcher Eduardo Tovar participated in the symposium, with CISTER being the only partner of the K2 Digital Mobility project. The unit will actively contribute with its in-depth knowledge on real-time embedded computing in a set of selected topics, and will therefore have the chance to collaborate with key

industrial players like Virtual Vehicle (leader of the project), AVL List, Audi, BMW, Jaguar Land Rover, Siemens, among others from a total of more than 100 project partners.

Once again, our research unit sees its strong efforts in establishing effective collaboration with industrial partners paying off, and therefore increasing its value in technology transfer activities, and maintaining its leading role in cutting-edge research and technology for the automotive industry in the European space in the coming years.



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*progress in projects*

## PORTUGUESE INDUSTRY BOOSTS COMPETITIVENESS WITH NEW COLLABORATIONS IN PARIS AIR SHOW

The Portuguese Aeronautic, Space and Defence Cluster (AEDCP), was deeply involved in various activities at the Paris Air Show. Also two important AEDCP strategic collaborations were signed – one with the Hamburg Aviation cluster and the other one with the Canadian cluster from Ontario and Montreal. These cluster level collaborations enhance the competitiveness of the Portuguese industry, and effect contributions to policy and regulatory regimes.

AEDCP represents the Aeronautical, Space, Security and Defence industries and research players in Portugal with the objective to provide a single

platform for promoting and supporting the competitive development of the sector.

The constituting members of AEDCP – the industrial federation of Aeronautic (PEMAS), Space (PROESPAÇO) and Defence (DANOTEC) – gather the representation of the three paramount sectors with clear trans-sectoral synergies and cumulated added value for creation of a national “super-cluster”. As a member, CISTER was represented by researcher Eduardo Tovar. Some Portuguese participants included GMV, TEKEVER, EMBRAER, EDISOFT, ALTRAN, Critical Software, among others.

## PORTO WITH ENHANCED IOT/EMBEDDED ECOSYSTEM



DSR (Doing Software Right) has announced the setting up of an European

office in Porto. DSR is a software development and consulting company specializing in the areas of Cloud, Embedded, Mobile, and Enterprise. Considering the common competencies in embedded systems and IoT, Roman Lavlinskiy from DSR, responsible for business development, visited CISTER last June and discussed possible collaborations.

## CISTER PARTICIPATES IN THE PORTUGUESE AGENDA FOR SCIENCE AND INNOVATION IN CYBER-PHYSICAL SYSTEMS

In the scope of the Portuguese Government resolution “Commitment to Knowledge and Science: Commitment to the Future”, the Foundation for Science and Technology (FCT), the national agency for research, technology and innovation, is promoting the elaboration of a set of research and innovation thematic agendas.

These agendas aim to mobilize the national actors, contributing to identify challenges and opportunities and foster the articulation between different actors of the Portuguese research and innovation system in a long-term perspective. In addition to identifying the country’s strengths in each theme, the agendas will allow the identification of areas that are considered as emerging and promising for the Portuguese research and innovation community.

One of the 14 agendas deals with “Cyber-Physical Systems and Advanced Forms of Computation and Communication”, being developed by a number of researchers and innovators from academia and industry, and counts with the participation of CISTER researchers Luis Miguel Pinho and Eduardo Tovar. The topics included in this agenda range from embedded computing systems to cloud computing, from platforms and infrastructures to smart applications, and from dependability and real-time properties to methodologies and tools for designing these systems. An overview of the challenges and research topics of the agenda was presented last July 5th, at “Ciência 2017”, the annual meeting of the Portuguese science and technology community, in a session with the participation of CISTER researcher Luis Miguel Pinho.

## INVITED TALK AT SAFETY CRITICAL SYSTEMS WORKSHOP

CISTER researcher Luis Miguel Pinho gave an invited talk in the Safety Critical Systems Workshop that took place in June in Granada, Spain. He presented the results of research done at CISTER on the challenge of timing analysis for high-performance parallel systems. The talk included an overview of the current and future challenges posed to critical applications due to the unpredictable interactions in parallel platforms, as well as the work performed by CISTER to address these challenges, done in the scope of the P-SOCRATES FP7 project. The talk was organized by the EMC2 European Project, with representatives from around 100 European institutions, both academic and industry in audience. The workshop included a set of invited talks and more than 40 demonstrators of technological developments in safety-critical domains from institutions in Europe.

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*achievements in academia*

## ECRTS CONFERENCE SEES STRONG CISTER PRESENCE IN DUBROVNIK



This year, CISTER has actively participated in the 29th Euromicro Conference on Real-Time Systems (ECRTS 2017), held in Dubrovnik, Croatia in June. ECRTS is known as the second most important conference in the area of real-time systems, in terms of quality of the publications and impact. Six senior researchers from CISTER attended the event: Eduardo Tovar, Patrick Meumeu Yoms, Vincent Nelis, Muhammad Ali Awan, Konstantinos Bletsas and Geoffrey Nelissen.

Several works from CISTER were presented at the conference, one in the main track, presented by Ali Awan, and another at the Work in Progress session (WiP), presented by Konstantinos Bletsas. Two other works were also presented by Geoffrey Nelissen and Vincent Nelis in the satellite workshops, the 8th Real-Time Scheduling Open Problems Seminar (RTSOPS), and the 16th International Workshop on Worst-Case Execution Time Analysis Workshop (WCET), organized in parallel to the conference. During the Interactive Session of the conference, Geoffrey Nelissen presented a call for action to build an “Erratarium” for the Real-Time Systems community: a platform that

would serve as a centralized repository for errata and discussion forum around errors discovered in published results on real-time systems.

Not only CISTER made an important contribution to the scientific advances of this year’s edition of ECRTS, by presenting cutting-edge works in the main track, WiP, and the satellite workshops, but also CISTER was also involved in the organization of the event.

CISTER researchers Vincent Nelis and Geoffrey Nelissen served as members of the Technical Program Committee, and Patrick Yoms Meumeu and Vincent Nelis served as chairs of the Work-in-Progress session and the RTSOPS workshop, respectively.

## WFCS PROGRAM COMMITTEE CO-CHAired BY CISTER RESEARCHER



The IEEE International Workshop on Factory Communication Systems

series has been around since the advent of Industrial Networking. The 13th edition (WFCS 2017) was hosted by the Norwegian University of Science and Technology (NTNU), in Trondheim, Norway, from May 31 to June 2. As an aside, CISTER held the 3rd edition as the very first conference organized by it in 2000. Seventeen years have passed since then, and CISTER has had the pleasure to host a panoply of other reputed conferences.

CISTER researcher Luis Lino Ferreira acted as Program Co-Chair along with Luca Durante from CNR – IEIIT, Italy. This year’s edition had a strong focus on wireless communications, with four different sessions addressing it, from the physical layer to MAC scheduling algorithms. Other sessions addressed the most classical themes in WFCS, wired communication MAC protocols (like CAN), application layer protocols, architectures and scheduling in the light of the new emerging technologies

and needs, such as Software Defined Networks. Although, transversal to all sessions, it is now possible to observe that security is of particular concern to all involved in Industrial networking systems (INS) research, and consequently a session addressing those specific topics took place in this year’s edition.

The conference also had two keynotes, respectively by Prof. Jerker Delsing, from the Luleå University of Technology, Sweden who discussed the main problems of integrating IoT application with industrial systems, and Trygve Harvei from ABB, Norway, who highlighted how industries are addressing the new breakthrough paradigms rapidly spreading out all over the INS environment.

The 14th edition of the WFCS conference will be held in Imperia, Italy, a beautiful, historical town overlooking the Mediterranean Sea.

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*achievements in academia*

## RTSS 2017 TPC MEETING IN PARIS

### RTSS 2017

IEEE Real-Time Systems Symposium

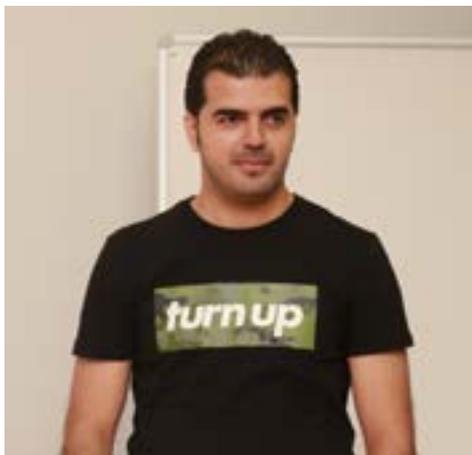
December 05-08, 2017  
Paris, France



The IEEE Real-Time Systems Symposium (RTSS), is the premier conference in the area of real-time systems, providing a forum for the presentation of high-quality, original research covering all aspects of real-time systems theory, design, analysis, implementation, evaluation, and experiences. For its 2017 edition, the Technical Program Committee meeting was held in Paris, June 24. Together with other renowned researchers from all over the world, CISTER researchers Eduardo Tovar, Luís Miguel Pinho, Konstantinos Bletsas and Patrick Meumeu Yomsi participated in the selection of papers. RTSS 2017 will be held in Paris, France this December.

*activities in the centre*

## A NEW COLLABORATION BETWEEN CTU PRAGUE AND CISTER

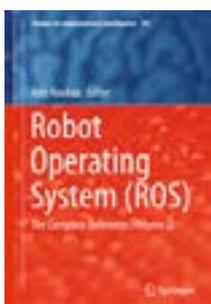


Aasem Ahmad, a Ph.D. student from Czech Technical University in Prague, is doing an internship at CISTER.

He presented a seminar on “Scheduling algorithm for large scale ZigBee cluster-tree WSNs” providing an overview of his recent research work, which focuses on scheduling time-constrained data flows with opposite directions in ZigBee cluster-based networks. Given the common interest in this research line between the two research units, CISTER researchers Ricardo Severino and Eduardo Tovar have been collaborating with Aasem towards the application of his scheduling strategy to other protocols, in a more application oriented perspective.

Hopefully, this will trigger new research collaborations aiming at further developing the support wireless infrastructure for the Internet of Things (IoT) and Industry 4.0 paradigms.

## BOOK ON ROBOT OPERATING SYSTEM TOPS SPRINGER LIST



CISTER researcher Anis Koubâa’s books on Robot Operating System (ROS) are quickly becoming a reference and a companion for ROS users and developers. The Volume 1 has been listed in the top 25% of the most downloaded eBooks in the relevant SpringerLink eBook Collection in 2016.

The book provides the reader with a comprehensive coverage of the Robot Operating Systems (ROS) and the latest related systems, which is currently considered as the main development framework for robotics applications.

Anis Koubâa, as an editor, has also released a second volume of the book.