CISTER Quicknews

APRIL & MAY,2017

CISTER celebrates 20 years

It seems like it was yesterday!

CISTER is celebrating 20 years of activity! It has been two extraordinary decades during which CISTER engaged with 52 (40 international) research projects, with an involvement of more than 300 CISTER researchers of 60 different nationalities.

These projects accounted for more than 11 Million Euros of competitive funding, and collaboration with more than 400 international academic and industrial partners. We also hosted 25 International Conferences and Workshops, and around 50 international project meetings, totaling more than 2000 participants coming from prestigious companies and academic institutions worldwide.

These have been 20 years providing prestige to the stake-holding institutions: in the foreground clearly the School of Engineering (ISEP) of the Polytechnic Institute of Porto (IPP) but also the Faculty of Engineering of the University of Porto (FEUP) and INESC-TEC. We express our gratitude for the support and enthusiasm.

Started as the IPP Hurray! Research Group in 1997, and becoming the CISTER Research Center later in 2003, it has grown to become one of the leading international research units in the area of critical computing systems and cyber-physical systems. The research focus includes many critical applications tackling various societal challenges, including aeronautics, automotive, smart-cities, Industry 4.0 and Cyber-Physical Productions Systems, ICT for Health, and many other domains.

You are all invited to join us this September to celebrate with us ▪

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new projects

DIGITALIZATION OF THE EUROPEAN INDUSTRY
THE START OF THE EU PROJECT PRODUCTIVE 4.0

The kick off meeting of Productive 4.0 project was held in Infineon facilities in Dresden.

The main objective of Productive 4.0 is to achieve significant improvement in digitalising the European industry by means of electronics and Information and Communication Technology (ICT). Productive 4.0 is the largest European project to date, with 104 partners from 19 countries, with an overall budget of 114M euros.
Due to its characteristics, this project has been chosen by the European Commission as a Lighthouse Initiative, since it builds on well identified market-pull demands, structured upon visionary solutions, with a very strong pan-European dimension and a robust business plan.
CISTER is involved in this project and will continue its previous work on the highly successful Arrowhead framework developed during the Arrowhead project.
This Service Oriented framework will be the cornerstone for all communications among industrial devices on the Productive 4.0 future manufacturing environment.
CISTER leads the work on providing solutions for Quality of Service (QoS) for Industrial Internet of Things (IIoT) environments.

This project, which is being led by Infineon, combines a very strong group of European companies like Volvo, Ericsson, Thales, Philips, STMicroelectronics, SAP, Bosch, NXP Semiconductors, ABB, etc.

START OF EUROPEAN PROJECT SCOTT
BUILDING TRUST IN THE INTERNET OF THINGS

Creating trust in wireless solutions and increasing their social acceptance are major challenges to achieve the full potential of the Internet of Things (IoT).

SCOTT aims to extend the IoT for wirelessly connected smart sensor and actuators to be used in mobility, building & home / smart infrastructure, and health domains. It will not just deal with "things that are connected", but with "trustable things that securely communicate". SCOTT will therefore enable efficient, trustworthy connectivity and facilitate ubiquity of intelligent embedded systems and systems of systems.

The SCOTT consortium includes European industrial leaders such as NOKIA, SIEMENS, Bosch, Ericsson, NXP, Embraer, Philips, AVL, GMVSkysoft, ACCIONA and INDRA and a number of leading academic institutions in Europe.

CISTER researchers Eduardo Tovar and Ramiro Robles participated in the kick-off meeting of SCOTT project, held in Graz, Austria, in May. CISTER is a member of the core team members of SCOTT.

CISTER has a number of core roles including: project leader for the reference architecture for the development of the guidelines of the infrastructure design; co-leader (together with Embraer) of the effort on aeronautics and member of the SCOTT Strategic Board, along with the project leader (Virtual-Vehicle) and all the 17 Large Enterprises (LEs).

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progress in projects

CISTER LEADS DEPENDABLE WIRELESS TECHNOLOGIES FOR AERONAUTICS

The final review and the final dissemination event of the DEWI project took place in Graz, Austria, in April. The event included the public demonstration of all use cases in the project.

DEWI provides key solutions for wireless seamless connectivity and interoperability in smart cities and infrastructures, covering four main industrial domains: aeronautics, automotive, rail and building.

The preliminary feedback from the reviewers was extremely positive. CISTER played many important roles in this project, including the leadership of subproject SP2 on aeronautics and the workpackages related to the high level architecture, standardization and certification and regulation. CISTER's researcher Ramiro Robles was also the chair of the Technical Board of the DEWI project.

THE ARROWHEAD PROJECT ON IOT AUTOMATION CONCLUDES IN STYLE

The results of the last review meeting of the Arrowhead project are now available and couldn't have been better. Arrowhead has been classified as excellent, signifying that "it has fully achieved its objectives and technical goals and has even exceeded expectations". The Arrowhead 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.

The exploitation results were considered impressive, with the reviewers acknowledging the quality of the industrial pilots, which demonstrated an in-depth approach of the Arrowhead framework applicability.

Supported by the results achieved in Arrowhead, partners already have more than 10 products in the market, and four startup companies were also initiated. Dissemination results were also of high standards with the publication of the "IoT Automation: Arrowhead Framework" book by CRC Press and several high quality publications. Additionally, the project supported the establishment of business cooperation among some of the participating companies, which goes beyond the traditional expected cooperation of industry-academia.During these four years, the project counted with the participation of several CISTER researchers, namely Luis Lino Ferreira (project leader), Michele Albano, Paulo Barbosa, Renato Ayres, José Silva, Filipe Pacheco, César Teixeira, Ricardo Garibay-Martinez among others.

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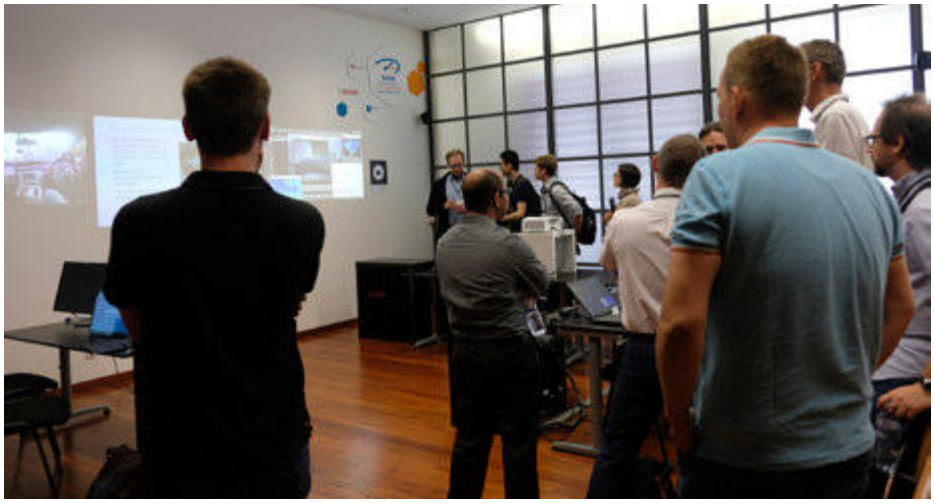
activities in the centre

INNOVATION FOR SAFE AND SECURE HIGHLY AUTOMATED AND AUTONOMOUS SYSTEMS



In May, ISEP and CISTER hosted the second General Assembly of the ENABLE-S3 project. ENABLE-S3 is a leading European project in the area of Autonomous Cyber-Physical Systems, led by AVL List GmbH.

Over 100 participants representing well-known companies such as Airbus, Thales, Siemens, Philips, Renault, IBM, among many others, attended this meeting, the last one before the first year's evaluation of the project in June 2017.

Besides the usual Steering Board and Technical Board meetings, several project-wide and use-case specific sessions, ENABLE-S3 also had the first Market Place.

This consisted in the exhibition of the results of the first year of work of several use cases, including the first prototype demonstrators. All participants had the chance to get an overall idea of the work being carried out outside the context of their own specific involvement in the project.

The Market Place took place in the Hands-On laboratory of CISTER's building.

All the hard work done during the meeting was rewarded with a very pleasant social event that

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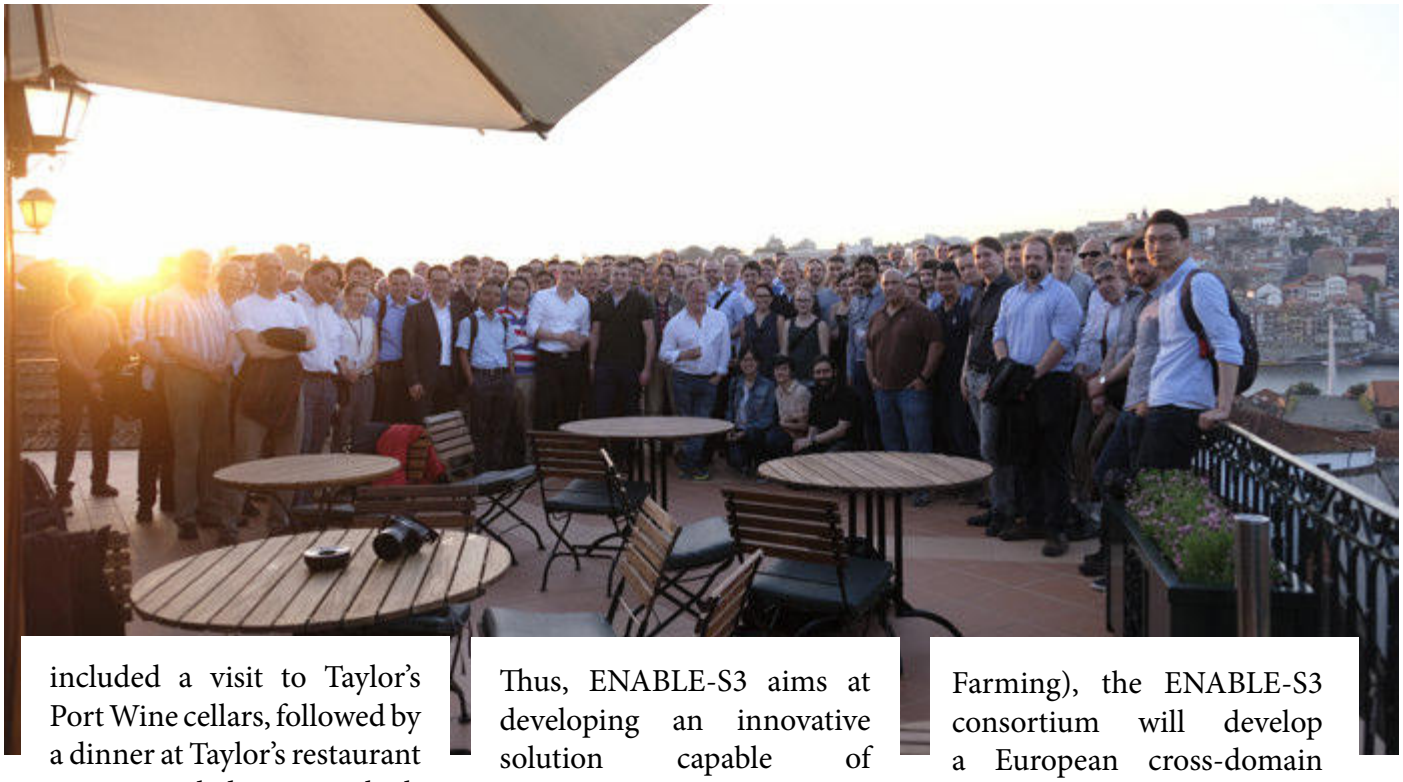

included a visit to Taylor's Port Wine cellars, followed by a dinner at Taylor's restaurant - Barão Fladgate - which offered all the participants the opportunity to relax and network with the beautiful view over Porto's old town and the Douro river.

ENABLE-S3 is an industry-driven project that aspires to substitute today's cost-intensive verification and validation efforts by more advanced and efficient methods to pave the way for the commercialization of highly automated cyber physical systems (ACPS). Pure simulation cannot cover physics in detail due to its limitations in modelling and computation.

Real-world tests are too expensive, too time consuming and potentially dangerous. Thus, ENABLE-S3 aims at developing an innovative solution capable of combining both worlds in an optimized manner.

Driven by 12 industrial highly automated systems use-cases from 6 industry sectors (Automotive, Aerospace, Rail, Maritime, Health, Farming), the ENABLE-S3 consortium will develop a European cross-domain framework for cost-efficient verification and validation of the functionality, safety and security of ACPS, combining experts with tool suppliers and academia to overcome main testing challenges▪

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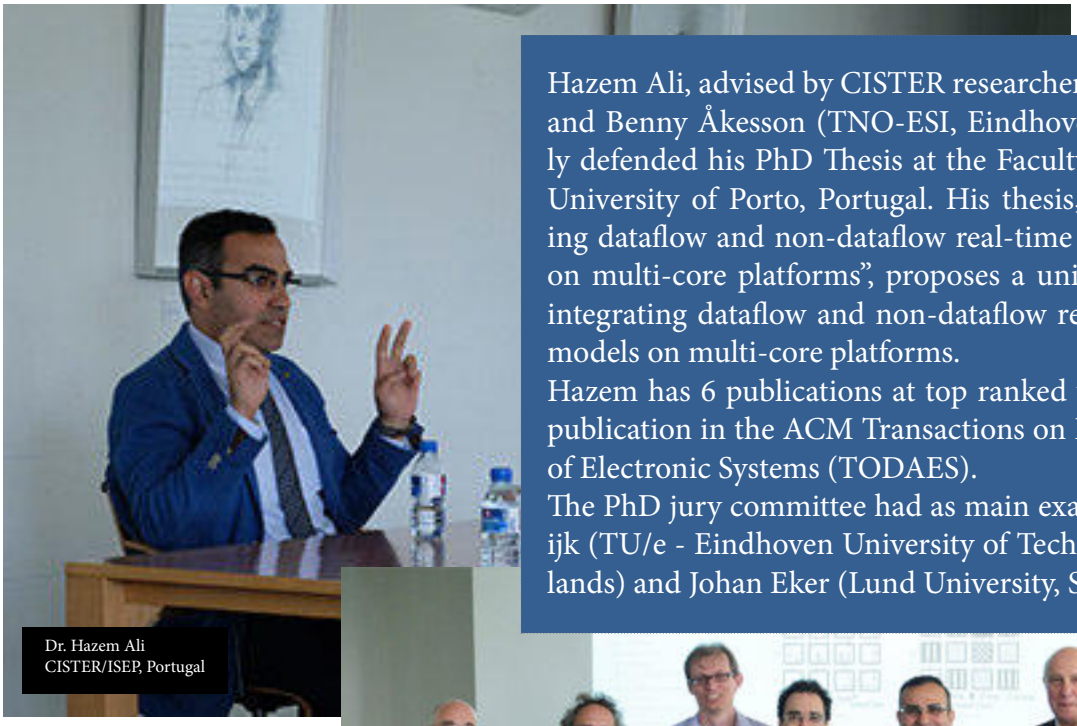
achievements in academia

CONGRATULATIONS HAZEM ALI FOR YOUR PHD!!!



Dr. Hazem Ali
CISTER/ISEP, Portugal

Hazem Ali, advised by CISTER researcher Luís Miguel Pinho and Benny Åkesson (TNO-ESI, Eindhoven), has successfully defended his PhD Thesis at the Faculty of Engineering of University of Porto, Portugal. His thesis, entitled "Integrating dataflow and non-dataflow real-time application models on multi-core platforms", proposes a unified framework for integrating dataflow and non-dataflow real-time application models on multi-core platforms.
Hazem has 6 publications at top ranked venues, including a publication in the ACM Transactions on Design Automation of Electronic Systems (TODAES).
The PhD jury committee had as main examiners Sander Stuijk (TU/e - Eindhoven University of Technology, the Netherlands) and Johan Eker (Lund University, Sweden).

Left to right
Dr. Luís Miguel Pinho
CISTER/ISEP, Portugal

Dr. Johan Eker
Lund University, Sweden

Dr. Sander Stuijk
TU/e, the Netherlands

Dr. Mário Sousa
FEUP/UPorto,Portugal

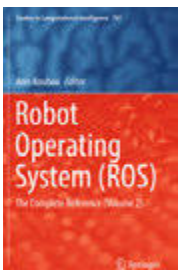
Dr. Hazem Ali
CISTER/ISEP, Portugal

Dr. José Matos
FEUP/UPorto,Portugal

Dr. Benny Åkesson
TNO, the Netherlands

Dr. Luís Almeida
IT/FEUP, Portugal

NEW BOOK
OPERATING SYSTEMS FOR UNMANNED AERIAL VEHICLES



CISTER researcher Anis Koubâa, in an editorial role, has released a new Springer book on Robot operating systems. The book titled, "Robot Operating System (ROS) – The Complete Reference (Volume 2)" focuses on Unmanned Aerial Vehicles (UAVs) with ROS.

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activities in the centre

DISTINGUISHED SEMINARS BY SCIENTIST FROM TNO...

Benny Åkesson from Embedded Systems Innovation by TNO, Netherlands, gave a distinguished seminar titled "PROGNOSIS- Reducing Design Time and Promoting Evolvability through Virtual Prototyping".

In the talk, and the follow-up discussion, he introduced the research project PROGNOSIS -- a 3-year joint effort between TNO and Thales -- and presented a general vision on improving the development process of complex fire control systems by using model-based design (MBD). Benny Åkesson received his PhD degree in Electrical Engineering at Eindhoven University of Technology, the Netherlands, on the topic of real-time memory controllers. During the following five years, Benny extended this work as a Researcher at the Eindhoven University of Technology, Czech Technical University in Prague, and at CISTER. Since 2016, he is employed as a Research Fellow at Embedded Systems Innovation by TNO (TNO-ESI) in Eindhoven, where he is doing applied science in an industrial setting. His research interests include platform architectures, real-time resource scheduling, performance virtualization, and virtual prototyping. He is the author of more than 50 peer-reviewed international publications and two books about memory controllers for real-time embedded systems.

...AND MAX PLANCK INSTITUTE

Mitra Nasri from Max Planck Institute for Software Systems, Germany, gave a distinguished seminar titled "Offline Equivalence: A Non-Preemptive Scheduling Technique for Resource-Constrained Embedded Real-Time Systems".
She presented an online policy that is equivalent to a given offline table to combine some of the advantages of both online and offline scheduling.
Mitra Nasri is a post-doc at Max Planck Institute for Software Systems (MPI-SWS) and holder of a fellowship from Alexander von Humboldt Foundation. She works on real-time scheduling and schedulability analysis, non-preemptive and limited preemptive scheduling, algorithm design, real-time control systems, and parameter assignment and optimization problems.
Before being a part of MPI-SWS, she was a post-doc at the Chair of Real-Time Systems in Technische Universität Kaiserslautern.
She received her Ph.D. from the University of Tehran (Iran). During her Ph.D., she was also a visiting researcher in Technische Universität Kaiserslautern.

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calls

NEW RESEARCH STUDENT CALL

CISTER is looking for candidate students willing to do research in Real-Time Embedded Computing.

We are looking for highly motivated candidates with a Master's degree in Electrical and Computer Engineering (ECE), Computer Science (CS), Software Engineering (SE), Applied Mathematics (AM) or related areas, and an excellent academic record. Candidates with solid industrial CV wishing to pursue a PhD degree are also encouraged to apply. Excellent spoken and written communication skills in English is considered essential.
The selected candidates will be given the chance to become part of an international and multi-cultural research team with a leading research track on multiple hot topics of RTES.

CISTER's research environment is boosted by strong collaborations with various renowned academic institutions, such as the Carnegie Mellon University, the Technical University of Munich, the Max Planck Institute, the University of Pennsylvania, the University of York among many others, as well as with key international industrial players like Airbus, Volvo, Embraer, Honeywell, Critical Software, GMV or Bosch.

Application deadline: 4th of July 2017

More information at *www.cister.isep.ipp.pt/jobs/*

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