OCTOBER 2018

cister-labs.pt

a new force is born

CISTER - Research Centre In Real-Time & Embedded Computing Systems

A special issue of CISTER Quicknews

A Re-Energized CISTER

A new academic year is now starting, and it is worth sharing several reasons for us all to get enthusiastic and committed about CISTER. During the past few years CISTER has been through tough times. Despite our track record of excellence, the 2013 international evaluation was hindered with inconsistencies that penalized our grade and led to a long rebuttal that ended in 2017, mostly in our favour. We are currently in the middle of a new evaluation process, which we firmly believe will recognize our excellence again. The CISTER Quinquennium (2013-2017) Report (www.cister-labs.pt/QR2017.pdf) provides a comprehensive overview of our achievements and productivity in the period as well as an insight on our strategy and workplan for the future.
During these 5 years, CISTER had to overcome significant financial constraints. Because of the turbulent evaluation process, the FCT pluriannual funding just started to flow in by 2017. Additionally, during most of the period, CISTER had significant costs to use and operationalize the brand new CISTER building. One significant bad consequence was the limited financial capacity to enrol new PhD students, and that was aggravated by FCT not issuing calls for project proposals (especially suited to support PhD-students' research).

These constraints have been overcome. We are now released from most of the cost of the building and, at the same time, a call for FCT projects was launched in which we were able to secure 5 new projects, in very complementary and compelling areas. These two facts together are pivotal to enable our noteworthy strategic plan regarding attracting new PhD students, as detailed in the "Outlook" Section of our Quinquennium Report. We have already enrolled 12 new PhD students in the past few months, and we will enrol 3 more until the end of 2018.

The past couple of years has also been stained by the uncertainty created by law 57/2016, which albeit designed to "stimulate scientific jobs stability" caused, in practice, a great instability due to all the delays in implementing it. CISTER had to overcome plenty of bureaucratic difficulties and was finally able to implement the opening of ten 6-year and one tenured-track senior researcher positions, for which a significant amount of additional funding was secured. This will release financial resources for other strategic activities, and, together with the longer-term stability to fulltime PhD researchers, it is a new setting that will play an important role for CISTER in the years to come.

We have also changed gears regarding direct industry collaborations. In the past, most of the competitive funding of CISTER was coming from fundamental-research or industry-driven project grants. However, in recent years, we have significantly expanded direct industry contracts as a result of our CiTech and CiWork initiatives; we have ongoing contracts with key companies such as EFACEC, Honeywell, Sonae, or Edisoft, and a number of others will soon materialize. Additionally, CISTER is deeply involved with Altran Portugal for the setup and governance of a Collaborative Lab focusing on Cyber-Physical Systems and Cyber-Security, for which a kick-off meeting was held at CISTER a couple of weeks ago. This CoLab will be an additional industry-related collaboration that will sum-up with the

many others we have in place and are fostering with various players.

All these have been significant successes of CISTER during very difficult times. CISTER is celebrating in 2017/2018, two decades of history. The celebrations started in September 2017 with a special event involving some of the precursors of CPS in Portugal. A number of other events have been part of the celebrations; including the Kick-off for the above mentioned CoLab and will end with the formal setup of CiTech, the Portuguese industrial eco-system on safety-critical computing that CISTER is promoting. A notable event celebrating these 20 years was the organization of the CPSWeek 2018 last April. Porto was the epicentre of CPS (Cyber-Physical Systems) with more than 600 participants from all over the world converging to Porto to engage in more than 20 events, including conferences, workshops, tutorials and competitions (www.cister-labs.pt/cpsweek2018)

But we have also recent changes in management and institutional leverage. Since several years CISTER had affiliates both with ISEP as well as with FEUP. Taking the opportunity of the ongoing new evaluation process, CISTER re-defined the institutional arrangement and now both ISEP and FEUP are participant institutions of the unit. Also, since last July, CISTER has a new management team.

All the ingredients seem to be in place to allow properly tackling the new challenges and opportunities that lay ahead.

Join us in our re-energized CISTER Labs!

New Management Team

Above the CISTER Board of Directors in a meeting. From left to right: Luis Lino Ferreira (Adjunct Director), David Pereira (BoD Member), Ricardo Severino (BoD Member), Luis Almeida (Vice Director), Eduardo Tovar (Director), Filipe Pacheco (Vice Director), Sandra Almeida (BoD Member) and Paulo Gandra de Sousa (BoD Member).

The CISTER BoD is unable to carry out all the challenges in front without the support of staff members, pictured below. From left to right: Cristiana Barros, Marwin Adorni, Laís Natalino, and Inês Almeida.

Celebrating 20 Years

The Research Centre in Real-Time and Embedded Computing Systems (CISTER) is based upon a research group created in 1997 at the School of Engineering (ISEP) of the Polytechnic Institute of Porto (P.Porto). Since then, it has grown to become one of the leading international research centres in real-time and embedded computing systems.

CISTER went through three previous international evaluation processes. In both the 2003 and 2007 evaluation processes, CISTER was granted the classification of "Excellent" (the highest possible mark at that time), being the only Portuguese unit in the areas of Electrical Engineering, and Computer Science and Engineering to top-rank in both evaluations. In 2013 CISTER went through another international evaluation process. It was an unfortunate process, with mistakes that led to achieving a lower ranking than what would be expected. The process lasted more than 3 years (it ended January 2017) and CISTER was evaluated only with "Very Good".

In 2012, CISTER joined INESC-TEC as an associated autonomous research unit. Opposed to what was expected, the concept of association of research units (individually evaluated) was not considered in the 2013 evaluation process. Nonetheless, CISTER maintained the liaison with INESC-TEC during the quinquennium (2013-2017), with INESC-TEC being a secondary management institution (ISEP was the main management institution). For the ongoing evaluation, which institutionally frames CISTER for the quinquennium 2018-2022, ISEP is the main management institution and the Faculty of Engineering of the University of Porto (FEUP) is the secondary management institution. This comes as a natural evolution as CISTER includes researchers affiliated with ISEP (the majority), and from FEUP since 2013. This also better reflects the long existing collaborations of CISTER with both ISEP and FEUP, given that FEUP is the academic institution that hosts most of the doctoral programs (e.g., the ECE or the dual-degree FEUP-CMU ECE programs) in which CISTER researchers have been involved.

1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017

IPP hurray! GROUP
http://www.hurray.isep.ipp.pt

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

900+
Scientific Publications

400+
Academic and Industry Partners

100+
Hosted Seminars

50+
General/Program Chair roles

Major Scientific Conferences and Workshops

37+
Supervised PhD Students

500+
Program Committee Member

30+
Hosted International Conferences & Workshops

3000+
Participants

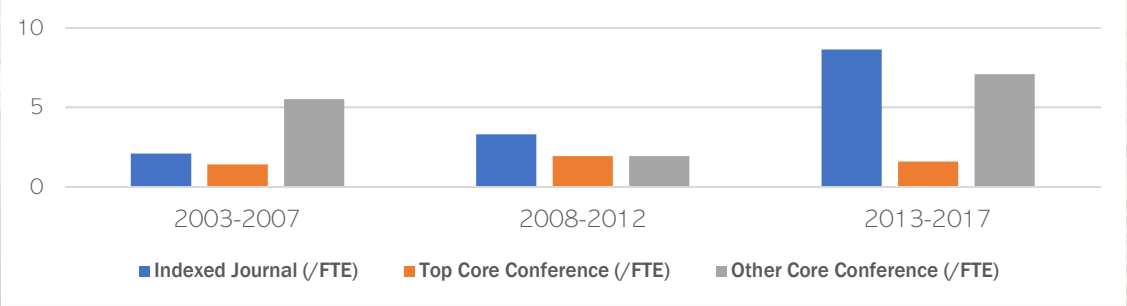
50+
Hosted International Project Meetings

Sustained Growth

Publications

In the quinquennium 2013-2017, CISTER researchers have published around 100 international journal papers resulting in a healthy number of around 2 journal papers per year and per FTE (Full Time Equivalent) integrated research PhD. CISTER targets the top 3 conferences in real-time and embedded systems, namely IEEE RTSS, Euromicro ECRTS and IEEE RTAS. These are tier-1 (Top Core) premier conferences typically with an acceptance rate in the range of 20-25%.

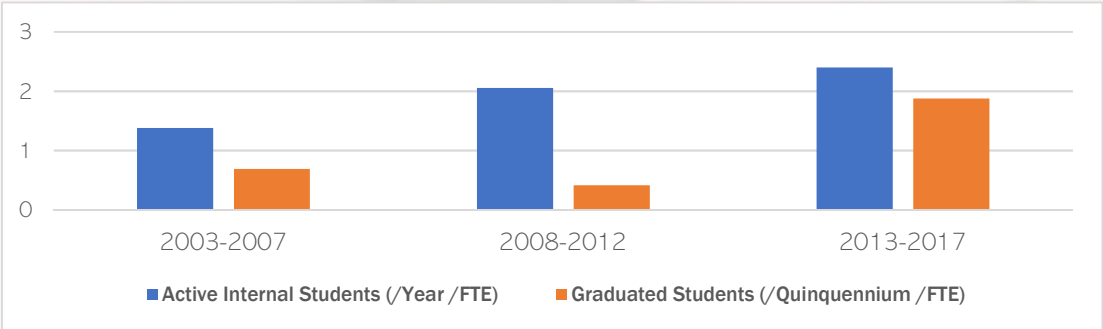
Below are the main publication indicators for the last three quinquennia (normalized per FTE).



PhD Students

During the quinquennium 2013-2017, CISTER had around 23 PhD students active every year. Overall, 18 PhD students graduated and 17 new PhD students enrolled during that period. On a long term strategy, we expect to grow to a target of around 35 active PhD students in a few years.

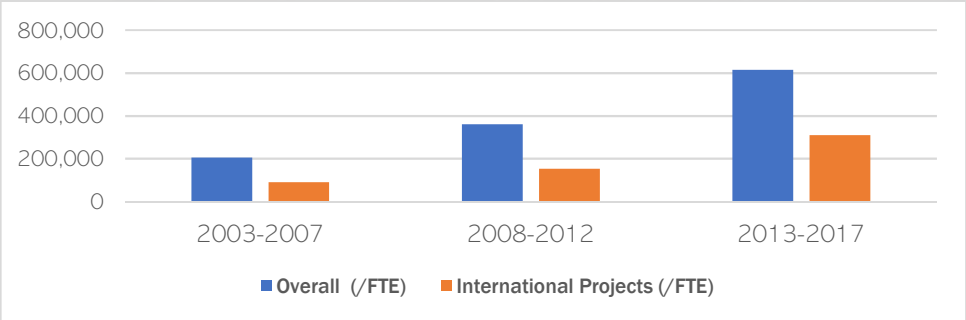
The chart below lists the average number of PhD students per year for the last three quinquennia as well as the number of PhD that graduated in each quinquennia (all normalized per FTE).



Funding

During quinquennium 2013-2017, CISTER was able to secure around 5.9 million euros of competitive funding (FCT pluriannual funding, project awards and direct funding from industry and services). The split between institutions is: 5.5 MEuros (ISEP) and 0.4 MEuros (FEUP).

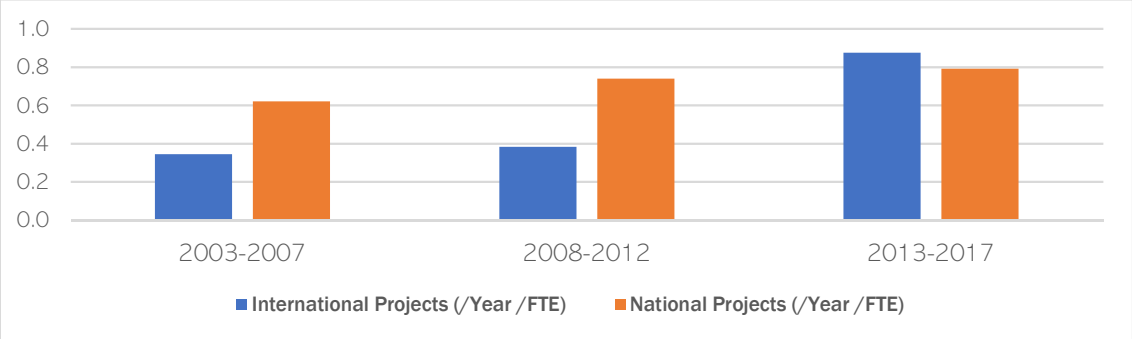
The chart below shows the evolution of the overall funding and international project funding in Euros, both per quinquennium and per FTE.



Projects

During the quinquennium, CISTER was able to secure a continuous stream of fundamental and industry driven projects with a total funding of over € 3,500,000.00, In the context of which CISTER researchers delivered theoretical/foundational results and have also developed tools and prototypes with a strong potential for industrial exploitation. Noteworthy is the fact that, from the total of projects active during the period, 14 are international industry-driven projects, in collaboration with many key industrial players such as Infineon, Airbus, Siemens, AVL, Thales, IBM, NXP, Magneti Marelli, Philips, Renault, Continental, Bosch, Schneider, Vestas, among many others.

The following chart shows the average number of active projects per year, within each quinquennium (and per FTE). The less impressive increase of the number of National Projects results from the lack of FCT project calls during the last quinquennium.



Outlook

Strategy & SWOT

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CISTER strategy is built around four main pillars:

1. sustain an advanced graduation program and create future researchers and domain experts;
2. produce high quality research with worldwide visibility and recognition;
3. create strong national and international networks to exchange knowledge, promoting and improving the quality and reach of embedded systems research in Portugal and internationally;
4. enable successful technology transfer towards industry.

PhD students

For the coming quinquennium, CISTER plans to increase the number of PhD students to around 30-35 at the end of the period (i.e., an increase of 50% as compared to the number at the end of 2017). Our goal is to reach an average of 2 PhD students per integrated PhD member and an average of 3 PhD students per FTE at the end of 2022.

Integrated PhD members

With the application of the recently adopted Portuguese law (Law 57/2017, Article 23 in particular), we will offer longer-term contracts (typically 6 years) or tenured contracts as a rule for integrated PhD members, with significant financial support from FCT.

By implementing this action, it will be possible for CISTER: (i) to build a more stable long-term research strategy supported by permanent full-time researchers; (ii) to ensure increased stability and commitment of those researchers towards directing PhD students; and (iii) to boost the capability to engage in even more research projects (international, national or direct industry-funded), where those full-time researchers can act as Principal Investigators.

World-class research topics

Along with their pervasiveness and ubiquitous deployment, embedded platforms are becoming increasingly complex as they grow more powerful and heterogeneous, owing to ever increasing and demanding requirements, as well as specialization for demanding features. Their complexity and resource-awareness bring further challenges to the development of reliable, efficient and time-predictable systems. In fact, the embedded computing field is nowadays one of the fastest evolving ones, with limits being pushed every day. This arises from new disruptive applications such as the internet of things, smart factories or autonomous vehicles. Autonomous high-performance applications are required to safely operate in complex heterogeneous systems, ranging from entirely centralized to highly distributed systems, and integrating simple hardware with limited power, memory and computing capabilities together with platforms including multi and many-core processors, GPUs, and FPGA accelerators.

It is therefore understandable that CISTER's activity plan for the forthcoming years aligns with the international R&I agendas and societal challenges (e.g., H2020 advanced computing and CPS, ECSEL MASRIA, ITEA living roadmap), and in particular in research directions that build upon the centre's internationally recognized topics.

The main focus of the centre's activities is on the impact of the non-functional timing properties of embedded systems in its correct functioning. This implies ensuring the systems' safety and dependability through both novel timing and schedulability analysis methods, which are able to reason on the temporal behaviour of the system and detect abnormal behaviour, enforcement of timing properties, through novel or extensions to existing programming and specification languages, OS mechanisms, communication protocols, middlewares, and reference architectures for the development of the next generation of real-time embedded systems. CISTER has a successful track record in these topics, applying its research results to various domains such as automotive, avionics, space, railway, smart buildings and factory automation, in which timing properties play a crucial role.

Projects

Fundamental research projects funding is important to CISTER's strategy as it typically allows for supporting a fraction of the PhD-students (those not directly funded by PhD-student FCT grants) and it is crucial to enhance the creation of competitive knowledge and competencies. One of the main sources for that type of funding used to be FCT-funded projects. Unfortunately, during the quinquennium 2013-2017, FCT barely had calls launched. This was a different situation as compared to the previous quinquennia. It is worth mentioning that in quinquennium 2008-2012, during which FCT-calls for projects existed every year, CISTER was able to win 12 new proposals (2-3 per year). 2018 is starting excellent in this domain with 5 new FCT projects from the 2017 call just starting.

CISTER is also engaging with a larger set of instruments that will enable other sources of funding, including funding to support PhD-students. There is a growing number of direct-industry collaborations for developing low TRL efforts. These

include companies such as Embraer, EFACEC, Honeywell, Edisoft or Sonae, with new contracts already in place in 2018. Furthermore, CISTER is involved in efforts for defence offsets and in large strategic projects/programmes such as the 2018-2022 COMET K2 Digital Mobility 48MEuros programme being managed by Austrian key players; this initiative has tens of industrial players from Europe offering a new set of opportunities and synergies that CISTER will be able to exploit in conjunction with the H2020 calls or even directly with funding from the COMET K2 initiative itself.

It is important to mention the current strategic European programs in the area of embedded systems and cyber-physical systems such as ECSEL or ITEA. CISTER researchers are very active within those two programmes, and in the past quinquennium, CISTER successfully engaged and participated (with multiple leading roles) in 14 funded international projects.

CISTER has been an active member of various national clusters since a number of years; notably, PEMAS (Portuguese Industry Aeronautics Association) and AED (Aeronautics, Space and Defence cluster) and collaborations with companies involved have been growing significantly in articulation with the instruments that CISTER is nurturing; namely the CiTech and CiWork initiatives. It is more than expected that funding coming from direct industry contracts will keep growing steeply.

It is also worth mentioning the continuous effort CISTER is doing in adapting the core research competences to cover a growing number of application domains. Two examples are (i) the interplay between security and safety and (ii) the integration of artificial intelligence technologies in real-time embedded systems. Concerning the former, a larger structured collaboration is being developed with Altran Portugal to be materialized soon: the Vortex CoLab.

Knowledge transfer, technology transfer and outreach

The activity plan of CISTER foresees to continue and reinforce transferring knowledge and technology between the unit and industry. It will do so through both industry-driven projects and direct subcontracting with companies. The latter case will be particularly reinforced; the unit plans to formally create a tech transfer office, in articulation with companies, an initiative which has already been presented and informally named CiTech. In this scope, and to further solidify its close connection with industry, CISTER will continue to organize a yearly workshop (CiWork) that brings together researchers and practitioners from the industry and academia and provides them with a bidirectional platform to report and discuss on the recent advances and developments in the area, as well as current and potential solutions for industrial applications.

In parallel, the unit will work with the hosting institutions to promote IPR policies, balancing the needs of industrial collaboration with the capacity of publishing results in scientific conferences and journals. CISTER is a research centre, and collaboration with industry should not impact the ability of its students and researchers to openly publicize their results.

CISTER will proceed implementing its CISTER Quicknews, a well-succeeded dissemination and awareness effort. The CISTER Quicknews will continue to be distributed bi-monthly to policy-makers, industrialists and members of the society.

S — Strengths

- Recognition & leadership
- Strong international network
- Capability of attracting competitive funding
- International working environment
- Facilities

W — Weaknesses

- Hard to compete at the international level w.r.t. salary levels
- Permanent members cannot devote more than 50% of time to RTD, including management, because of high teaching loads

O — Opportunities

- Growing importance of RTES
- Porto is a new International tech hub in safety-critical computing
- Enlarging the institutional commitment (ISEP + FEUP)
- The stability that will be provided by new contracts (law 57/2017) to a few CISTER PhD researchers
- Reduction of tuition fees for PhD students from 2017-2018

T — Threats

- Talent Acquisition & Retainment
- Funding sources; specially for fundamental research projects (e.g., the national research council was not opening enough calls during the last quinquennium)
- Portugal policy towards ECSEL projects

Research Projects Starting in 2018

2018 started excellent with 5 new FCT projects, totalling over 1 MEuros of funding to CISTER. CISTER leads four of these projects (REASSURE, PReFECT, AIRNET, and 5GSDN) and is a partner in the AQUAMON project. Notably, CISTER is leading a new H2020 CS2 project, THERMAC, in which Honeywell is the industrial stakeholder. We are also starting another new H2020 ICT project, ELASTIC, which is a follow-up of a previously lead H2020 P-POCRATES. Finally, worth mentioning a new national industry-driven project that started in july, FLEXIGY, and new direct-industry contracts with Edisoft (for a ESA project), Honeywell and Sonae. The FCT projects lead by CISTER all have industrial stakeholders, such as GMV and Critical Software (in PReFECT), Tekever (in ARNET), AVL (in 5GSDN) and Edisoft (in REASSURE).

REASSURE

Secure Runtime Verification for Reliable Real-Time Embedded Software

FCT - 183KEUR (CISTER)

PI: David Pereira, CoPI: Luis Miguel Pinho

THERMAC

Thermal-Aware Resource Management for Modern Computing Platforms in the Next Generation of Aircraft

H2020 Clean Sky 2 - 444KEUR (CISTER)

CoPIs: Eduardo Tovar & Geoffrey Nelissen

Direct-Industry Contracts

3 new direct-industry contracts, NDA-protected, with EDISOFT, Honeywell, and SONAE

PIs: Luis Miguel Pinho & Cláudio Maia, Geoffrey Nelissen, Luis Lino Ferreira

AUTOMOTIVE

INDUSTRY 4.0

FLEXIGY

Energy Flexibility Services Platform
PT2020/ANI - 181KEUR (CISTER)
PI at CISTER: Luis Lino Ferreira

ELASTIC

A Software Architecture for Extreme-ScaLe Big-Data Analytics in Fog Computing Ecosystems
H2020 ICT - 305KEUR (CISTER)
PI at CISTER: Luis Miguel Pinho

AQUAMON

Dependable Monitoring with Wireless Sensor Networks in Water Environments
FCT - 87KEUR (CISTER)
PI at CISTER: Luis Almeida

PReFECT

Predictable Multiprocessor Platforms for Embedded Safety-Critical Systems
FCT - 237KEUR (CISTER)
PI: Eduardo Tovar, CoPI: Geoffrey Nelissen

ARNET

Airborne Relaying Networks for Reliable and Secure Mobile Communications
FCT - 233KEUR (CISTER)
PI: Kai Li, CoPI: Eduardo Tovar

5GSDN

MAC-PHY Cross-Layer Design and Multi-Objective Optimisation of 5G Software Defined Networks
FCT - 232KEUR (CISTER)
PI: Ramiro Robles, CoPI: Eduardo Tovar

SMART CITIES

AVIONICS

5 PhD Students already Graduated in 2018

May 15
FEUP
Dynamic Hierarchical Bandwidth Reservations for Switched Ethernet
Zahid Iqbal, supervised by Luis Almeida (CISTER/FEUP)

July 19
UFSC, Brasil
Integrated Method for Designing Complex Cyber-Physical Systems
Fernando Gonçalves, sandwich PhD Student at CISTER supervised by David Pereira (CISTER/ISEP)

April 10
MAP-i (UMinho, UAveiro, UPorto)
Dynamic Contracts for Verification and Enforcement of Real-time Systems Properties
André Pedro, co-supervised by Jorge Sousa Pinto and Luis Miguel Pinho (CISTER/ISEP)

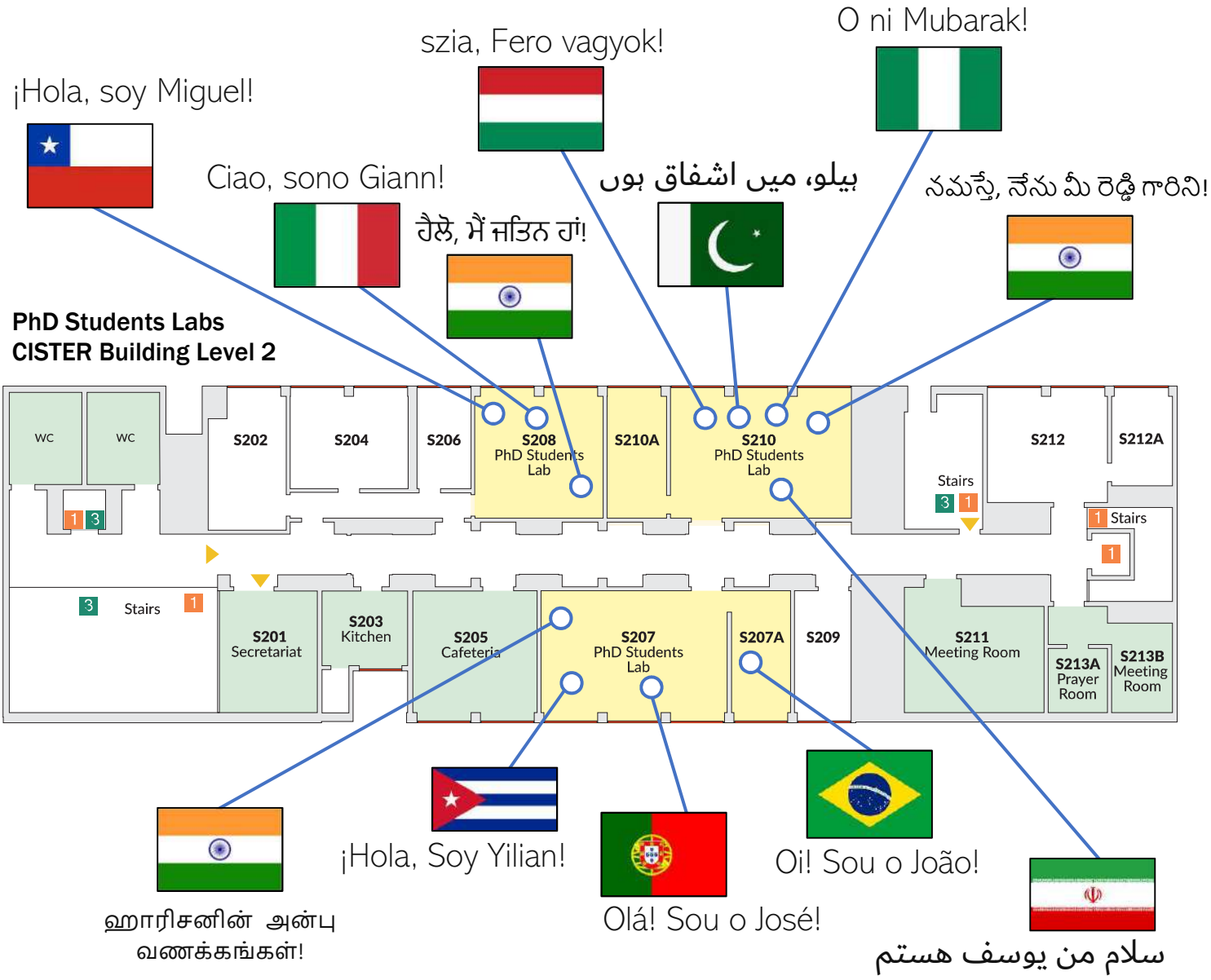
May 29
FEUP
Real-Time Software Transactional Memory
António Barros, supervised by Luis Miguel Pinho (CISTER/ISEP)

April 10
FEUP
Aerial Multi-Hop Sensor Networks
Luis Pinto, co-supervised by Luis Almeida (CISTER/FEUP)

Designed by topntp26 / Freepik

Feeding the International PhD Students' Pipeline

In 2018, 12 new PhD students have already enrolled with CISTER in an exciting research environment. This is a tremendous boost to sustain cutting-edge fundamental research, which is developed in a very international environment where over 70 researchers from more than 20 nationalities work



Creation of Vortex CoLab

A new collaborative lab, led by Altran Portugal, is being setup in Cyber-Physical Systems and Cyber Security with the key participation of CISTER

GOALS

OUR VISION

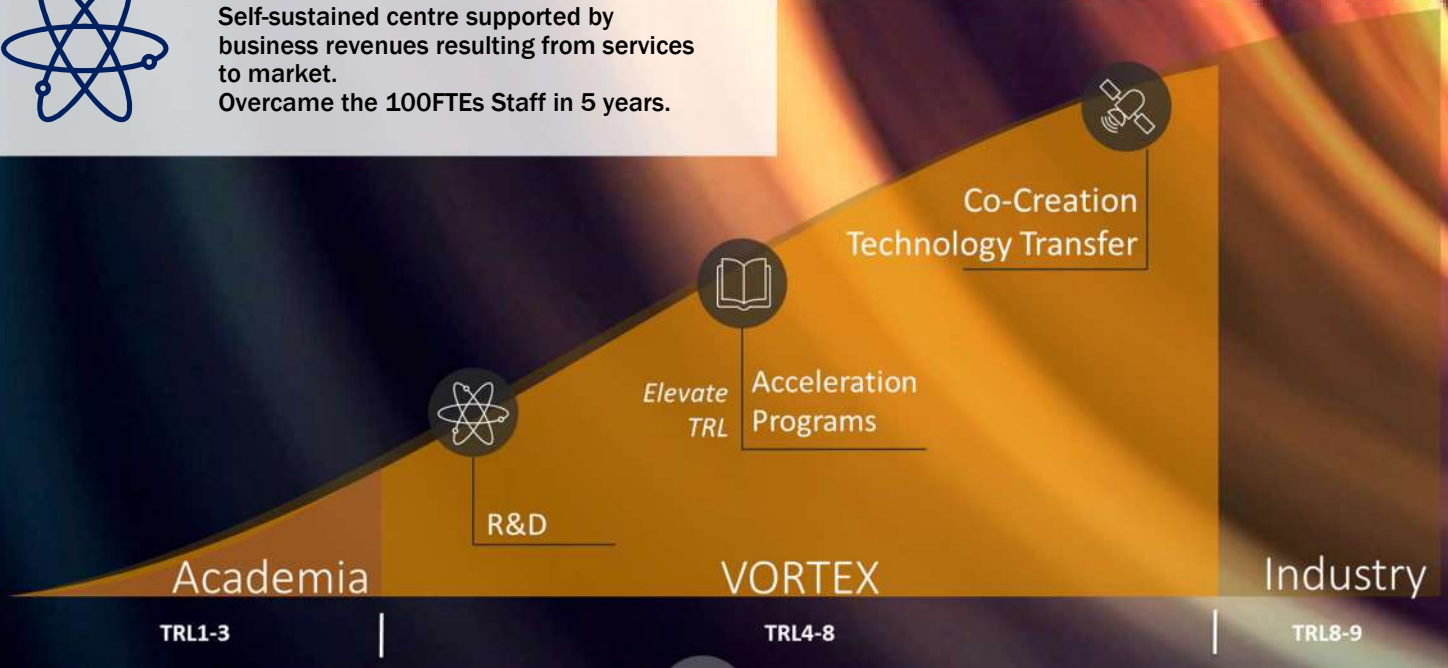
Become the biggest centre of acceleration and technology transfer on Cyber-Physical Systems in Portugal being a European Reference on the global market.

OUR MISSION

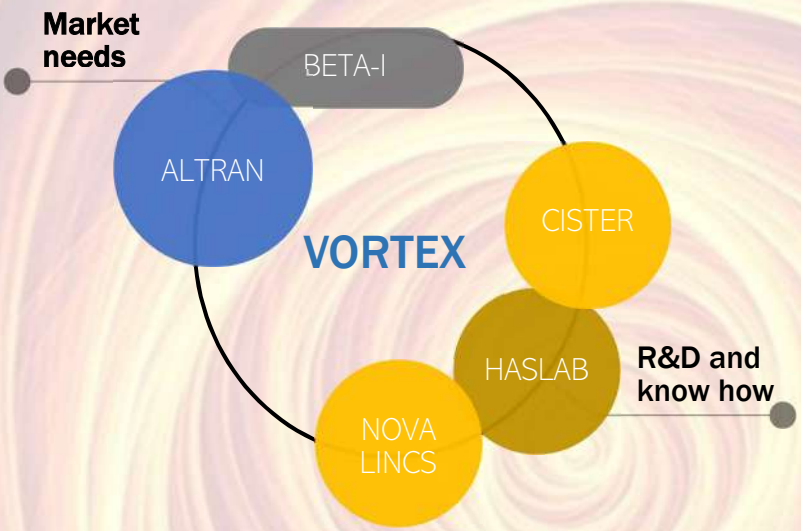
Accelerate Cyber-Physical Systems solutions and technology bricks to enable the technology transfer and co-creation with European industrial leaders.

GOALS

Self-sustained centre supported by business revenues resulting from services to market.
Overcame the 100FTEs Staff in 5 years.



WHY?



ALTRAN
Application Domain | Business Drive | Usability

CISTER - ISEP
Systems | Safety| Communications | Control

HASLAB - INESC-TEC
Security | Safety | Systems | Usability

NOVALINCS - FCT-NOVA
Intelligence | Usability | Systems | Security

BETA-I
Active Coaching | Business Drive

KICK OFF MEETING

October 2nd, 2018 at CISTER.

Porto as the epicenter of Cyber-Physical Systems

CPS Week 2018 took place in April, in Porto, organized by CISTER. This was the 11th edition of the event and it was only the 4th time in Europe. Previous editions in Europe were in Stockholm, in 2010, Berlin, in 2014, and Vienna, in 2016. More information at www.cpsweek.org

Four Top Conferences

- 21st ACM International Conference on Hybrid Systems: Computation and Control (HSCC)
- 9th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS)
- 17th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN)
- 24th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)

More than 20 Events

4 main conferences

12 Workshops & 8 Tutorials

2 Competitions

F1/10 Racing Competition & Microsoft Indoor Localization Competition

2 Student Forums

24 event rooms/areas

Industrial Sponsorship & Participation

Microsoft Research

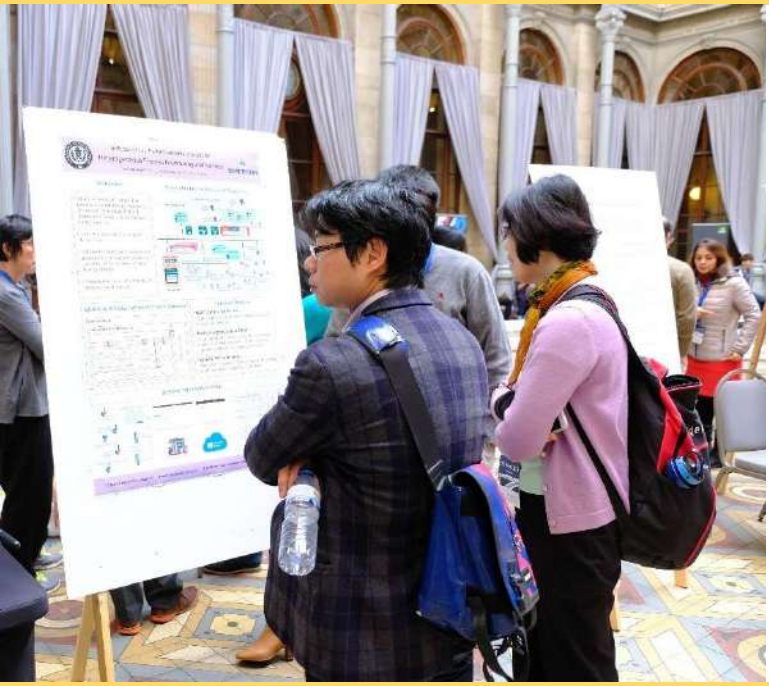
TOYOTA

BOSCH

NVIDIA

DENSO

MathWorks



Global Event

over 600 registrations

nearly 40 countries

3 global keynotes

35+ conference sessions

40+ workshop/tutorial sessions

95+ posters/demos

100+ paper presentations

30+ CISTER local coordination team members, including 20 undergrad volunteers

CISTER Brief Quicknews

JANUARY – OCTOBER 2018

Industry Collaborations

January 10
Michele Albano participated in the general assembly of the MANTIS project in Ghent.

January 12
Eduardo Tovar participated in the AEDCP (Aerospace and Defence Cluster Portugal) General Assembly in Lisbon.

January 24
Ricardo Severino, Luis Lino Ferreira and Raghu R. participated in a meeting with ABB and others at CISTER

January 24
Luis Miguel Pinho presented results of KhronoSim and P-SOCRATES projects in the scope of the HiPEAC 2018 conference in Manchester.

February 13
Gaming app from EnerGAware project released in app stores.

February 15
Luis Miguel Pinho, Cláudio Maia and Renato Oliveira participated in the KhronoSim project meeting held at Critical Software in Coimbra.

February 26
Ricardo Severino and Pedro Santos participated in a SafeCOP project meeting held at GMVIS Skysoft in Lisbon.

March 1
Ramiro Robles participated in the SCOTT project meeting as member of the strategic board in Amsterdam.

March 2
Luis Lino Ferreira participated in a project preparation meeting with SONAE and VPS in Coimbra.

March 23
David Pereira and Filipe Pacheco participated in a DSGrid technical meeting in EFACEC, Maia.

April 18
Michele Albano participated in the final MANTIS General Assembly meeting in Budapest.

April 21
David Pereira participated in VORTEX CoLAB, led by ALTRAN, proposal presentation in Lisbon.

April 26
Ramiro Robles attended a SCOTT project meeting in Amsterdam.

May 14
Ramiro Robles participated in the ISO/IEC/JTC1 SC41 meeting in Berlin where the SCOTT-ISO liaison was accepted.

May 23
Ricardo Severino participated in the annual review meeting of the SafeCOP project in Brussels.

May 25
Ramiro Robles attended the 2nd General Assembly and SCOTT project meeting in Tromsø.

June 15
Eduardo Tovar attended the H2020 Delegates and Experts meeting in Lisbon.

June 20
Eduardo Tovar attended the ECSEL JU Symposium 2018 in Brussels.

June 20
SCOTT project wins "Best Project Presentation and Communication Award" at the ECSEL JU Symposium 2018 in Brussels.

July 5
David Pereira participated in ENABLE-S3 review project meeting, held at IBM in Dublin.

July 6
Pedro Santos participated in a SafeCOP project meeting in the facilities of GMVIS Skysoft in Lisbon.

July 11
Michele Albano participated in the MANTIS project final review meeting in Mondragon, Spain.

July 23
Konstantinos Bletsas visited the French national aerospace research centre in Toulouse.

July 25
David Pereira participated in a meeting of the REASSURE project together with University of Minho researchers Jorge Sousa Pinto and José Carlos Bacelar, which took place in CISTER.

August 21
Honeywell visited CISTER for a meeting on their ongoing projects with Geoffrey Nelissen, Patrick Meumeu Yomsi and Humberto Carvalho.

September 26
Ramiro Robles participated in the SCOTT project review meeting in Amsterdam.

October 2
CISTER hosts the kick-off meeting of the VORTEX CoLAB.

October 10
Ricardo Severino, Bruno Vieira and Pedro Santos carried out a three days hands-on meeting with GMVIS Skysoft at CISTER, integrating vehicular platooning technology.

October 18
Ramiro Robles participated in the SCOTT General Assembly in Cork.

Fundamental Research Activities

January 18
PhD student Mubarak Ojewale presented a talk on "An Intelli-Fog Approach to Manage Real Time Actionable Data in IoT Applications" at CISTER/ISEP.

February 6
Patrick Yomsi presented a talk on "Towards Reliable Real-Time Data Emission in Mobile Intelligent Transportation Systems" at CISTER/ISEP.

February 27
PhD student Miguel Gaitán presented a talk on "An Information-Centric Network Prototype for IoT" at CISTER/ISEP.

March 8
Antonio Augusto Fröhlich (UFSC - LISHA) presented a Distinguished Seminar on "SmartData for a Trustful Internet of (Cyber-Physical) Things" at CISTER/FEUP

March 15
Karl-Erik Årzén (Univeristy of Lund) presented a Distinguished Seminar on "Control of and over the Cloud" at CISTER/FEUP.

March 17
Geoffrey Nelissen and Patrick Yomsi attended the technical program committee (TPC) meeting of ECRTS 2018 in Amsterdam.

March 27
Ramiro Robles presented a talk on "Cooperative and Retransmission Diversity for Real-Time multiple antenna Communications in Correlated Channels with Co-channel Interference" at CISTER/ISEP.

March 27
Luis Miguel Pinho participated in the Ada-Europe Board meeting in Warsaw.

April 13
CISTER hosts in Porto, the largest event on Cyber-Physical Systems, CPS Week 2018.

May 3
PhD student Ishfaq Hussain presented a talk on "A Multicore Processor Platform for Energy and throughput Aware Applications" at CISTER/ISEP.

May 15
Moris Behnam (Mälardalen University) gave a distinguished seminar on "Predictability and dependability in parallel architectures" at CISTER/FEUP.

May 15
Reinder Bril (TU of Eindhoven) gave a distinguished seminar on "Independent yet Tight WCRT Analysis for Individual Priority

CISTER Brief Quicknews

JANUARY – OCTOBER 2018

Classes in Ethernet AVB" at CISTER/FEUP.

May 22
PhD student José Fonseca presented a talk on "Response Time Analysis of Sporadic DAG Tasks for Global FP Scheduling" at CISTER/ISEP.

May 25
Luis Miguel Pinho took part of the committee for the PhD thesis defence of Milos Panic at the UPC in Barcelona.

June 2
Luis Miguel Pinho took part of the committee for the PhD thesis defence of Jorge Balaguer at the UP in Madrid.

June 26
Benny Åkesson gave a distinguished seminar on "Towards Certifiable Resource Sharing in Safety-Critical Multi-Core Real-Time Systems" at CISTER/ISEP.

July 4
Airbus and AED Portugal visited CISTER. Ricardo Severino hosted the delegation and presented an overview of the Research Centre's Activities.

July 20
Luis Miguel Pinho was the Technical Co-Chair of Real-Time and Networked Embedded Computing Chair at INDIN 2018 conference in Porto.

July 24
Ana Aguiar gave a distinguished seminar on "IoT for Smart Cities: Experiences from a large-scale pioneering deployment" at CISTER/ISEP.

July 24
Miguel Gaitán participated in the "1st Summer School on Control and Robotics" organized by FEUP and APCA in Porto.

July 25
Geoffrey Nelissen attended the technical program committee (TPC) meeting of RTSS 2018 in York.

September 20
Undergraduate student Renato Oliveira presented a talk on "Emulation library for a modular Cyber-Physical Systems simulation platform" at CISTER/ISEP.

September 20
Undergraduate students Joel Pinto and Rúbel Gonçalves presented a talk on "Experimental analysis of RTEMS in multi-core platforms" at CISTER/ISEP.

October 6
Michele Albano and Luis Lino Ferreira delivered the final version of the book "The MANTIS Book: Cyber Physical System Based Proactive Collaborative Maintenance" to the publisher.

Achievements in Academia

March
Guest Editorial: Special Issue on Communications Technologies and Infrastructures for Smart e-Health Systems co-authored by Sana Ullah published in the IEEE Systems Journal.

March 23
The paper titled "Buffer-aware bounds to multi-point progressive blocking in priority-preemptive NoCs" co-authored by Alan Burns and Borislav Nikolic won the Best Paper Award 2018 at the DATE 2018 in Dresden.

April
Publication of the book "Robot Path Planning and Cooperation - Foundations, Algorithms and Experimentations" co-authored by Anis Koubâa.

April 4
André Pedro successfully defended his PhD thesis titled "Dynamic contracts for verification and enforcement of real-time systems properties" at UMinho in Braga.

April 10
Luis Pinto successfully defended his PhD thesis titled "Aerial Multi-Hop Sensor Networks" at FEUP in Porto.

May 15
Zahid Iqbal successfully defended his PhD thesis titled "Dynamic Hierarchical Bandwidth Reservations for Switched Ethernet" at FEUP in Porto.

May 29
António Barros successfully defended his PhD thesis titled "Real-Time Software Transactional Memory" at FEUP in Porto.

June 23
Michele Albano gave a Keynote presentation titled "Framework for Proactive Maintenance in the Real World" at the MPMM 2018 conference in Coimbra.

July
Publication of the P-SOCRATES project book "High-Performance and Time-Predictable Embedded Computing" co-authored by Luis Miguel Pinho, Vincent Nélis and Patrick Yomsi.

July
Publication of the book titled Robot Operating System (ROS) - The Complete Reference (Volume 3) edited by Anis Koubâa.

July 6
The paper titled "On Strong and Weak Sustainability, with an Application to Self-Suspending Real-Time Tasks" co-authored by Geoffrey Nelissen was awarded the Outstanding Paper Award at the ECRTS 2018 conference in Barcelona.

August 2
Eduardo Tovar gave a Keynote presentation titled "IoT - Hype or Research Opportunities?" at the ICCCN 2018 conference in Hangzhou.

September 28
Guest Editorial: Special Issue on Applications and Technologies in Human-Centric Internet of Things co-authored by Kai Li published in the Journal of Computer Networks and Communications.

October 15
Kai Li nominated as Associate Editor for IEEE Access Journal.

In Memoriam

José Rufino
1958-2018

José Rufino is a highly influential member of the Portuguese Embedded Real-Time Systems research community. His work set the grounds for many others researching on dependable real-time communication and safety-critical real-time software, and he produced a considerable body of work in collaboration with the European Space Agency.

He passed away this last summer, on the 29th of July, a shocking news that took us all by surprise.

Jose Rufino, a professor at University of Lisbon, had frequent collaborations with CISTER and visited us for the last time in September of 2017 to participate in our 20th anniversary celebrations. Whoever came across Rufino will remember his acute critical eye in a somewhat shy and extremely kind character. Genuinely a good person.

So long Rufino!

CISTER - Research Centre in
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