

CISTER Quicknews

JULY - SEPTEMBER ISSUE, 2018



OUTSTANDING PAPER AWARD AT ECRTS 2018

A CISTER squad (**Geoffrey Nelissen**; **Patrick M. Yomsi**; **Konstantinos Bletsas**; **Muhammad A. Awan**; **Miguel G. Gaitán** and **Mubarak Ojewale**) led by the CISTER Director **Eduardo Tovar** splashed the 30th Euromicro Conference on Real-Time Systems (ECRTS 2018) in Barcelona, Spain.

ECRTS is the premier European venue for presenting research into the broad area of real-time systems and ranks as one of the top three international conferences on this topic.

Geoffrey Nelissen and **Patrick M. Yomsi** were part of the Technical Program Committee and the other members of the squad presented

papers at the main conference and/or satellite events.



Noteworthy, the paper titled “**On Strong and Weak Sustainability, with an Application to Self-Suspending Real-Time Tasks**”,

co-authored by **Felipe Cerqueira** and **Björn Brandenburg** from the Max Planck Institute for Software Systems (MPI-SWS) in Kaiserslautern, Germany and **Geoffrey Nelissen**, was awarded the Outstanding Paper Award.

The Outstanding Paper Award abstract is as follows: in the real-time research community, a scheduling

policy and/or a schedulability test for a scheduling policy is said to be sustainable if any system deemed schedulable by the schedulability test remains schedulable when the parameters of one or more individual tasks are changed in any, some, or all of the following ways: (i) decreased execution requirements; (ii) larger periods; (iii) smaller jitter; and (iv) larger relative deadlines.

In this paper, motivated by an apparent contradiction regarding whether certain scheduling policies are sustainable, the authors revisited the topic and argued that the existing definitions of sustainability should be further clarified and generalized.

SCOTT PROJECT REVIEW IN BRUSSELS

Ramiro Robles was present in the first year project review meeting in Brussels.

The review meeting was preceded by a rehearsal meeting with all the representatives of the different

domains, and industrial partners. The preliminary feedback was very positive and the work in the reference architecture and aeronautics domain lead by ISEP received positive comments.



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SUMMER SCHOOL ON CONTROL AND ROBOTICS

CISTER's PhD student **Miguel Gutiérrez-Gaitán** has participated in the "1st Summer School on Control and Robotics" organized by FEUP (Faculdade de Engenharia Universidade do Porto) and APCA (International Federation of Automatic Control).

The event held at FEUP on the 23rd and the 24th of July covered some key mathematics tools for advanced research in this field: Non-linear Control, Functional Analysis, Control of Robotic Manipulators, and Sparse Optimization and Image Processing.



Researchers, PhD students and professionals from different institutions of the country attended the sessions offered by leading researchers in robotics and control.

At CISTER, Gutiérrez-Gaitán is currently exploring some mathematical fundamentals applied in the context of wireless industrial networks.

6 INTERNATIONAL PHD STUDENTS JOINED CISTER

5 new students from Cuba, India and Iran have joined the CISTER for their PhDs.



Gianni Nandi holds a Bachelor's degree in Computer Engineering, from Federal University of Santa Catarina. Gianni received multiple scholarships to work researching both in Brazil and in the Netherlands. His interests include physical experiments using embedded systems, formal verification, and real-time processing.

José Antonio Echeverría CUJAE. They have also worked for the Automation department and CIME Microelectronics Research Centre, at the same University as Assistants Students.



Radha Pallavali holds a Bachelor's and Master's in Computer Science from Sri Venkateswara University, India. He has also worked for COPELABS - Portugal as a Junior Researcher and for INRIA - Paris as a Research Engineer. He has also published work in the areas like DoS Attacks in Cloud Computing and MANETs, and Congestion Control Algorithms.

Management & Technology, Jalandhar, India and a Master's degree in Embedded Systems from Sree Datta Institute of Engineering and Science, Hyderabad, India.

He has also worked for Guru Nanak Institutions Technical Campus (GNITC), India as a Research Assistant and for Punjab Micro Circuits Research Labs, India as a Project Engineer.



Yousef Emami holds a Bachelor's in Computer Hardware Engineering from Islamic Azad University of Dezfoul and a Master's degree in Information Technology Engineering-Computer Networks from Shiraz University of Technology. He has also worked for Kelide Andisheh Institute, Payame Noor University, Islamic Azad University of Shooshtar as a Lecturer and Azad University of Dezfoul as a Teaching Assistant.



Javier Rodriguez and **Yilian Ribot** hold a Bachelor's degree in Automatic Engineering from Havana University of Technologies



Jatin Arora holds Bachelor's in Electronics and Communication Engineering from CT Institute of Engineering,

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CISTER DISTINGUISHED SEMINAR SERIES

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

In order to keep pace with the increasing required processing power and to meet the high integration trend while maintaining a reasonable power consumption in recent real-time and safety-critical systems,

the move towards multicores is becoming unavoidable. In this talk, Benny discussed the state-of-the-art in resource sharing in multi-core systems and its application to safety-critical real-time systems.

Ana Aguiar, assistant professor at University of Porto (FEUP) and coordinator of the Networked Systems Group at Instituto de Telecomunicações (IT), Portugal, gave a distinguished seminar entitled “IoT for Smart Cities: Experiences from a large-scale pioneering deployment” at CISTER/ISEP. The talk addressed the issue of observing urban processes for the sake of citizens’ quality of life,

supporting better-informed policies and deployment of new services. Such observation requires sourcing heterogeneous technologies for sensing and data collection, which is a good fit for the Internet-of-Things (IoT). In the talk Ana shared her learn-by-doing experience in building a city-scale IoT deployment in the city of Porto that leveraged 19 static environmental sensors and a

vehicular network with 600+ vehicles to monitor the weather, environment (air quality and noise) and mobility. This was complemented with mobile crowdsensing that gathered data from more than 600 participants, collected it in a common backend and stored it using common spatio-temporal data models to simplify sharing and joint analysis for the characterization of urban dynamics.



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CISTER PERIODIC SEMINAR SERIES BY UNDERGRADUATE STUDENTS



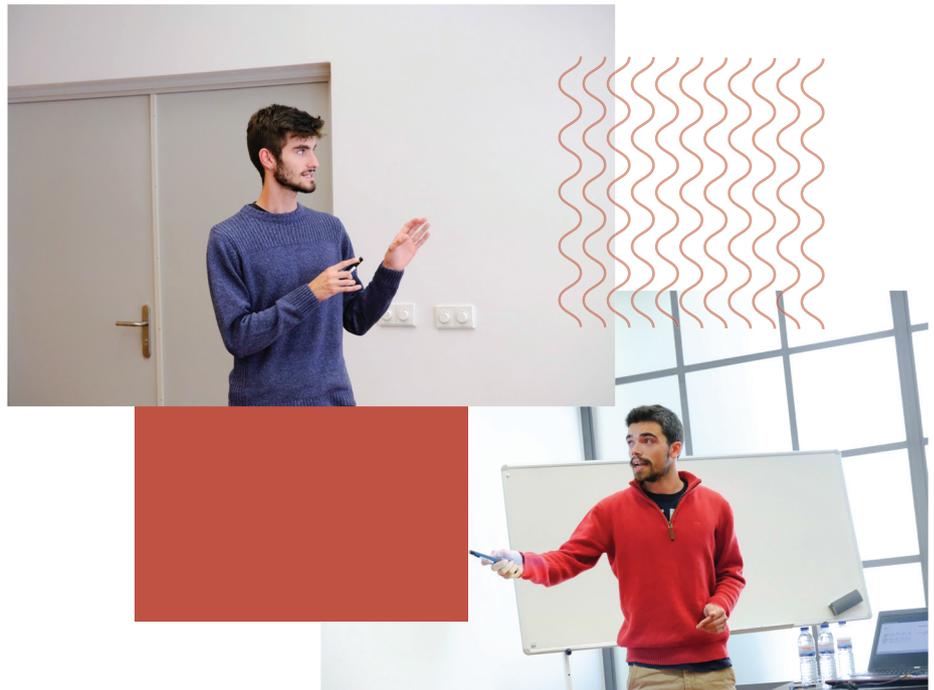
Renato Oliveira gave a talk at CISTER/ISEP premises entitled “Emulation library for a modular Cyber-Physical Systems simulation platform”. The talk focused on the issues the cyber-physical systems (CPS) community face when testing their systems.

Specifically, Renato presented two features developed in the scope of KhronoSim, a project in which CISTER is a partner and where the goal is to develop a modular and extensible testing platform to

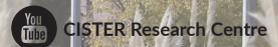
intuitively perform closed loop tests of CPS via software.

The first presented feature was the QEMU-Lib library that allows one to easily manipulate several QEMU instances at the same time. The second presented feature was a throttle mechanism that allows one to reduce the execution frequency of a guest machine executing on top of QEMU. Moreover, he presented results that show that both features can be used to ease the testing of CPS.

Joel Pinto and **Rúben Gonçalves** presented a talk entitled “Experimental analysis of RTEMS in multi-core platforms” at CISTER/ISEP. In this talk, both students covered their work on RTEMS, an open source real-time operating system designed to support embedded applications with the most stringent real-time requirements. Specifically, they showed the audience how RTEMS is structured, how its symmetric multiprocessing functionalities (i.e., scheduling and synchronization primitives) can be tested by means of test cases and finally, they showed how they ported a mine case study, initially developed for uniprocessor systems, to symmetric multiprocessing systems.



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