

## [PROXIMA processors for space applications win HiPEAC Technology Transfer Award](#)

The award has been made for developments in increasing the real-time performance of the Leon family of processors.



BSC has worked with Cobham Gaisler to develop Leopard, a 4-core Leon-based processor that is suitable for measurement-based timing analysis. Leopard is especially suited for the space domain, where Leon processors are widely used, and its capabilities have been satisfactorily evaluated with use cases from the European Space Agency and Airbus Defence and Space. Leopard has been developed within the [PROXIMA project](#).

Carles Hernández, one of the BSC researchers who has been recognised with this award, together with Francisco J. Cazorla and Jaume Abella, explains that “these new designs are the first step towards enabling the use of high-performance server-like processors in time-critical systems like the safety-related ones. “.

The developed processor architecture uses randomization techniques to make timing behaviour of jittery resources to be naturally exposed on the platform by making several runs of the same program and, consequently, releasing end-users from the burden of designing complex testing campaigns that in most cases cannot guarantee that the worst possible situations have been observed.

Cobham Gaisler is [now able to offer](#) its customers processor designs based on the PROXIMA technology

and is already advertising these products. The company also has plans to include the PROXIMA technology in some of its future processor developments.

This BSC success story was highlighted as having high potential market impact [in the Mixed-Criticality Systems Workshop](#), hosted by BSC on 22 November 2016. This workshop gathered over 70 experts in mixed-criticality systems from industry, academics and the European Commission. The companies and SMEs joining the event included Airbus, Airbus Defence and Space, Alstom, GMV, Intel, Infineon, Ericsson, Vodafone and ST.

The annual [HiPEAC Technology Transfer Award](#) aims to stimulate and recognise the uptake of research results by industry. Award winners receive **a certificate and a one-time financial award of EUR 1 000**.

In 2014 [PROXIMA received the 51<sup>st</sup> DAC Best Paper Award](#) for the paper “[Containing Timing-Related Certification Cost in Automotive Systems Deploying Complex Hardware](#)” by Leonidas Kosmidis, Jaume Abella, Eduardo Quiñones, Franck Wartel, Glenn Farrall and Francisco J. Cazorla. This year, PROXIMA also received the [award to one of the best papers in the 19<sup>th</sup> ISORC conference](#) for the paper “Modelling Probabilistic Cache Representativeness in the Presence of Arbitrary Access Patterns” by Suzana Milutinovic, Jaume Abella and Francisco J. Cazorla.

### **About PROXIMA project**

The PROXIMA project (Probabilistic real-time control of mixed-criticality multicore and manycore Systems), led by BSC, investigated novel solutions for the next generation of real-time critical embedded systems based on probabilistic analysis methods. It brought together leading European technology companies, such as Airbus Operations, Airbus Defence and Space, Infineon, SYSGO, Cobham Gaisler and Rapita Systems; some of the most important research centres in Europe (INRIA, Ikerlan and BSC); and leading academic partners including the universities of York and Padua.

PROXIMA, funded by the EC with a budget of over €6 million over three years, concluded in October 2016.

Further information is available at: [www.proxima-project.eu](http://www.proxima-project.eu)

### **About HiPEAC**

Since 2004, HiPEAC (the European network for High Performance and Embedded Architecture and Compilation) has provided a hub for European researchers in computing systems; today, its network, the biggest of its kind in the world, numbers around 1,500 specialists. The project offers training, mobility support and dissemination and recruitment services, along with numerous networking facilities to its members.

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