

Developing Projects in the Brazilian Space Program Context: A Case Study in the Design and Implementation of a Critical Embedded System for Space Applications

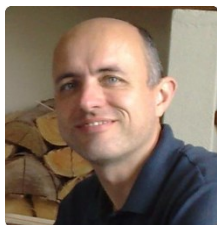
Prof. Eduardo Bezerra, Universidade Federal de Santa Catarina (UFSC), Brazil

**Thursday, 5th March 2015 at 18:00hrs, Room G3, Electrical Engineering Building
University of New South Wales (UNSW)**

The Brazilian Space Program started in 1961 as a government initiative named "Group for the Organisation of the National Space Activities Commission" (GOCNAE). In all these years, in order to cope with the deadlines and requirements associated to the variety of missions, very specific procedures and standards have been adopted. The presentation will briefly introduce the Brazilian Space Program, and how academic institutions manage to develop joint projects with the National Institute for Space Research (INPE). As a case study, the design flow and implementation of the communications subsystem of an on-board computer (OBC) will be presented.

The whole communications subsystem has been developed in a Brazilian university, under an INPE's contract by a consortium formed by two Brazilian companies. The Telecommand/Telemetry (TC/TM) subsystem has been designed according to the Consultative Committee for Space Data Systems (CCSDS) recommendations, and the European Space Agency (ESA) standards. In the presentation, the project roadmap will be discussed, along with some technical aspects of the design such as some of the adopted dependability features, including: ESA/CCSDS TC/TM coding scheme; hardware redundancy; radiation hardened hardware; hardware description language (VHDL) coding style; and design for metastability.

Short Biography:



Prof. Eduardo Bezerra is a Researcher and Lecturer of Computer Engineering at Universidade Federal de Santa Catarina (UFSC), Brazil, where he is with the Department of Electrical and Electronics Engineering since 2010. He was formerly with the Faculty of Informatics, Catholic University (PUCRS), Brazil, from 1996 to 2010. He received his Ph.D. in Computer Engineering from the University of Sussex (Space Science Centre), England, UK, in 2002. He is the author and co-author of papers published covering a broad range of scientific topics within the disciplines of Computer Engineering. His research interests are in the areas

of embedded systems, space applications, computer architecture, reconfigurable systems (FPGAs), software and hardware testing, fault tolerance and microprocessor applications. At PUCRS, he was the head of the Embedded Systems Group (GSE) where he led and managed several research projects funded by Brazilian Government Agencies and also by the industry. In 2004 he set up a company named Innalogics at PUCRS Technological Park. Innalogics is a spin-off of GSE aiming the improvement of industry-university collaboration in the field of embedded systems design.

Date, Time and Venue:

Thursday, 5th March 2015, 18:00 hrs start in Room G3, Ground Floor, Electrical Engineering Building ([Map Ref: G17](#)), University of New South Wales, Kensington, Sydney, NSW, 2052. Light refreshments will be served from 17:30 hrs onwards.

***** RSVP with your name and affiliation, indicating IEEE membership to acser@unsw.edu.au *****

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