

Training Opportunity for Portuguese Trainees

Reference	Title	Duty Station
PT-2013-TEC-EDM(1)	High-Level Validation Techniques for the SpaceWire-RMAP protocol	ESTEC
<p><u>Overview of the Unit missions:</u></p> <p>The unit of destination of the trainee is TEC-EDM, microelectronics section. The section is in charge of providing ASIC and FPGA technical support to ESA projects and of undertaking and coordinating R&D activities for new microelectronic technologies, including EDA tools, IP Cores, design methodology, HW-SW co-design, ASIC digital and analogue libraries, etc. The section also leads activities related to System-on-Chip design methodologies and verification techniques, especially for what concerns the use of models described at a high abstraction level.</p>		
<p><u>Overview of the field of activity proposed:</u></p> <p>Standards (CCSDS, ECSS, IEEE, etc.) are normally expressed with the English natural language; while this enables easy understanding of the overall concept behind the given standard, it does not usually provide a clear specification, mostly due to the ambiguities inherent in the use of natural language; moreover the clarity of the text depends on the writing style used. For this reason reference implementations, written using high-level programming languages (C, C++, etc.), are often provided together with the standard to ease its understanding and eliminate the ambiguities. When relevant for the standard, such reference implementation can also be directly used to (automatically) check the compliancy of any custom implementation with the standard itself.</p> <p>The main objective of the work consists of the development of a reference implementation of the SpaceWire-RMAP ECSS standard; the implementation will be written using the C++ language and it will be fully configurable to accommodate for the different options of the standard and the allowed partial implementations. The reference implementation shall also enable automatic testing of the compliancy of a given Design with the standard itself.</p> <p>After design of the reference implementation, appropriate methods have to be devised and applied to validate the reference implementation itself.</p> <p>Overall the activity presents challenges in devising the appropriate methodology to design a reference implementation which enables testing all the features of the SpaceWire RMAP standard and which is easily understandable by the user, thus effectively complementing the standard specification. Once the reference implementation is completed, mechanisms which enable its use to verify various types of implementations of the protocol have to be devised; such implementations range from software implementations to VHDL descriptions and to physical hardware systems.</p>		
<p><u>Required Education:</u></p> <p>Applicants should have just completed, or be in their final year of a University course at Masters level in Electrical or Computer Engineering. A strong background in Software Engineering, C/C++ programming and Hardware Description Languages (mainly VHDL) is required. Candidates must be fluent in English. Candidates should have a high degree of autonomy together with an attitude to work in an international team environment. They should have good communication skills and an interest into innovative technologies.</p>		