



# Pedro Palomo Pérez

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28<sup>th</sup> of June, 1977, Spanish

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## Education

**Academic Degree:** M.S. Degree in Computer Science – Universidad Politécnica de Madrid 2002

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## Languages

**English** Professional competence

**Spanish** Mother Tongue

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## Abstract

Software Engineer with experience in Real Time Systems, Critical Software, development and testing. Software Engineering applied for Real-Time Test benches. Knowledge of RCP (Rapid Control Prototyping), SIL (Software-In-Loop Simulation), PIL (Processor-In-Loop Simulation), HIL (Hardware-In-Loop Simulation).

Software engineering life cycle:

- SW High Level specification definition.
- SW Design and Implementation for Onboard Critical Systems.
- SW Verification for Onboard Critical Systems.
- SW Certification for Onboard Critical Systems and DO-178B DAL A or B compliant
- Hard Real Time SW Design
- SW Low Level Programming.
- SW Verification and Validation

Project Manager with capabilities and formal education to face duties of higher responsibilities within the development cycle (including scoping, scheduling, budgeting), team coordination and technical lead.

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## Experience

**At present** Project Manager of Embedded System Division of the Aerospace Engineering Business Unit at Deimos Space S.L.U.

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**2015 - At present    Elecnor Deimos - Aerospace Engineering Business Unit – Embedded Systems**

*Project Engineer*

Project *Meteosat Third Generation Scan Assembly (MGT SCA) ISVV*. Perform the Independent Software Verification and Validation of the Boot Software for the critical element MTG SCA (DAL-B).

Responsible of the review of datapacks and provide findings.

Project *E-GEM* is the design, development, integration, and operation of the 3Cat-2 cubesat satellite. 3Cat-2 launch and operations are supported by the E-GEM European GNSS-R Environmental Monitoring project, a FP7 Project 2014-2016 on the use of GNSS-Reflectometry for environmental monitoring from the 3Cat-2 nanosat.

Responsible of the advisory and consultancy in the onboard computer software analysis, design and development. The activity includes a tailoring of the ECSS-E-ST-40C, and the evaluation and monitoring of the SW activities.

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**2012 - 2014    Elecnor Deimos - Aerospace Engineering Business Unit – Embedded Systems**

*Project Manager*

Project *G(N)C & HDA Software Prototyping of the Lunar Lander Phase B1*. Implementation of the Hazard Detection and Avoidance algorithm in a real time platform composed by a PPC and an FPGA. Performing the functional decomposition in HW/SW, defining the real time system architecture, and validating the system against functional simulators.

Responsible of the management activities, relations with subcontractors and customer, performing technical specification, V&V plans and system/software design, preparation of the document releases and involved in the development of some parts of the software system.

*UML, Visual Paradigm, FPGA, PPC, VHDL, C language, VxWorks 6.6, Spacewire, Ethernet, PCI, Simulink, ECSS-E-ST-40C*

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**2012 - At present    Elecnor Deimos - Aerospace Engineering Business Unit – Embedded Systems**

*Project Manager*

Project *EXOMARS EDM Guidance, Navigation and Control SCOE*. Deimos is responsible in this project of the Real Time Simulator, the RTS is in charge of simulating the Environment, Dynamics, and GNC equipments. All the models will be developed in C code and integrated in a DLL library.

In charge of scheduling and managing the activities of the project, the relations with the customer and the coordination of the members projects. Performing technical specification, V&V plans and software design. Preparation of the document release.

*UML, Simulink, Embedded Coder, Redmine, Visual Paradigm*

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**2011    Deimos Space - Aerospace Engineering Business Unit – Embedded Systems**

*Project Engineer*

The Project *IXV Real Time Test Bench integrates* the GNC for the IXV mission developed in Simulink environment in a Real Time Bench, using autocoding with Embedded Coder Tool. The objective of the project is to run the GNC in a PIL configuration, and validates the GNC design in the Simulink Tool. The Real Time Test Bench is composed by the target processor (LEON3) where the GNC runs and the dSPACE platform where the DKE runs, both nodes interchange data through serial line.

In charge of performing the analysis to port the functional model to real time platform, defining the interfaces and implementing the embedded application on the LEON2  
*dSPACE, ControlDesk, Matlab/Simulink, Embedded Coder, C Code, SVN, LEON3 board.*

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**2011 Elecnor Deimos - Aerospace Engineering Business Unit – Embedded Systems**

*Project Engineer*

The Project *AEROFAST (AEROcapture for Future spAce tranSporTation) GNC Real Time Test Bench* integrates the GNC developed in Simulink environment in a Real Time Bench, using autocoding techniques with The Embedded Coder tool. The objective of the project is to run the GNC in a PIL configuration, and validates the GNC design in the Simulink Tool. The Real Time Test Bench is composed by the target processor (LEON3) where the GNC runs and the dSPACE platform where the DKE runs, both nodes interchange data through serial line. The operating System used in the LEON3 is RTEMS.

In charge of performing the analysis to port the functional model to real time platform, defining the interfaces and implementing the embedded application on the LEON2

*dSPACE, ControlDesk, Matlab/Simulink, Embedded Coder, C Code, SVN, LEON3 board.*

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**2008 - 2011 Deimos Space – Real Time Systems Division**

*SW-Development-Manager*

Project MGF (Message Generation Facility). MGF is the system in charge of build and distribute the navigation and integrity message for GALILEO satellites, collecting all the information from the other elements of the GMS (Ground Mission Segment). Hard Real Time SW system with parts classified as DAL B. Critical SW Development compliant with Safe Coding Standards (MISRA-C).

SW Development Manager at MGF project, coordinating a team of 7 software engineers in the coding phase, unit testing, pre-integration and integration, planning the work of the development team, solving conflicts between interfaces and participating in the codification of critical parts, resolution of issues involved in configuration management and coordinating the changes control in the SW during the validation and verification phases. All this according to the standards of the ESA and the Galileo project.

*C Code, Cantata, Cplusplus, LynxOS-178, Galileo Software Standard, VME, Pentium M.*

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**2007 - 2008 Deimos Space – Real Time Systems Division**

*SW-Development-Manager*

Project *MGF*: To make detail design of one of the components of the system using the HOOD methodology. Analysis of the functionality of the system and its schedulability. In charge of the coordination of three software engineer.

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**2006 - 2007 Deimos Space – Real Time Systems Division**

*SW-Development-Manager*

Project *MGF*: Working in the preliminary phases of the design: user requirement analysis, to extract element and software requirement, interface definition, high level design using: use case, sequence diagram and packet diagrams.

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**2005 Deimos Space – Real Time Systems Division**

*Project Engineer*

Project *RDG* (Raw Data Generator), tool in charge of simulate the constellation of GALILEO satellites, this tool is useful to help in the development of the other elements of GMS (Ground Mission Segment) of Galileo.

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**2005 Deimos Space – Real Time Systems Division**

*Project Engineer*

*GOCE* On Board Software Independent Software Verification and Validation. Responsible for the development of the high-fidelity software simulation of the GOCE Command and Data Management Unit (CDMU), based on TSIM/ERC32.

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## 2004 - 2005 **Deimos Space – Real Time Systems Division**

*Project Engineer*

*Interferometer Constellation Control (ICC2)* Responsible for the development of the communication layer between different boards (three LEON processor) and software simulation models of the spacecraft, hosted on a Dspace.

*C language , compilers and real time kernel RTEMS-4.6, hardware simulator TSIM-GRMON. Hardware: board LEON-PCI-XC2V, with serial-lines and Ethernet.*

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## 2003 - 2004 **Deimos Space – Real Time Systems Division**

*Project Engineer*

Development of the *Onboard Basic Software for the Precision Agile Control Systems (PACS) real-time test bench*, responsible for the development of the target computer (ERC32-based) HW/SW interface drivers, other tools were developed for this project like cmg simulator and tmtc tool for monitoring the onboard software. Hardware:

*C and Ada95 languages, compilers ObjectAda and gcc, hardware simulator TSIM. Hardware: board ERC32-SC-VME, with serial-lines and VME buses.*

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## 2002 - 2003 **Project Engineer – Ground Segment Division**

Project Engineer at DEIMOS of RGT ("ROP Generation Tool"). Operational tool developed to support ENVISAT Mission Management in the planning of ENVISAT mission planning. Implementation and validation of new improvements to File Transfer Process.

*UNIX, C++, Ilog views, ORACLE, Perl, Bash Script.*

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## Technical Skills

**Managerial Skills** Project management, management of technical groups.

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**Managerial Tools** Redmine, Jira, Microsoft Project, PMBOK guide

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**Operating Systems**

- Windows - Good
- Linux - Excellent
- LyxOS-178 - Excellent
- ORK - Excellent
- RTEMS - Excellent
- Object Ada - Excellent
- XGC – Excellent
- VxWorks - Good

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**Programming Languages**

- Matlab - Fair
- C - Excellent
- C++ - Excellent
- Java - Excellent
- Modula-2 - Excellent
- Ada95 - Excellent
- Assembly language on Intel and SPARC architectures – Excellent
- Perl – Good
- Shell Script (bash, sh)- Good
- Ruby - Fair

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<b>Analysis, Design and Development Methodologies</b>	<ul style="list-style-type: none"> <li>• UML - Excellent</li> <li>• HRT-HOOD - Excellent</li> <li>• HOORA – Excellent</li> <li>• Structured design - Good</li> </ul>
<b>Software Applications</b>	<ul style="list-style-type: none"> <li>• Microsoft office suite - Excellent</li> <li>• Matlab/Simulink – Fair</li> <li>• Embedded Coder</li> <li>• SCADE Suite</li> <li>• dSPACE – Good</li> <li>• Hardware simulators: TSIM, GRMON - Good</li> </ul>
<b>Software Standards</b>	<ul style="list-style-type: none"> <li>• ESA PSS-05, GSWS, ARINC-653, ECSS-E-ST-40C</li> </ul>
<b>Others (specify)</b>	<ul style="list-style-type: none"> <li>• Distributed systems: corba, client/server application with sockets, java RMI.</li> <li>• Relational databases: ORACLE, SQL.</li> <li>• Parallel systems: concurrency with threads and MPI.</li> <li>• HW platforms: <ul style="list-style-type: none"> <li>◦ Servers: SUN, Intel</li> <li>◦ Clients: Personal Computers</li> </ul> </li> <li>• Embedded Computer : ERC32, LEON</li> <li>• Source Code Repositories : SVN, CVS, Git</li> <li>• UML Design Tools : Visual Paradigm</li> <li>• Development Environment : Eclipse</li> <li>• HW Simulators: TSIM</li> <li>• HW Boards : LEON2, LEON3</li> </ul>

### Training

<b>Course/Seminar</b>	SCADE Seminar: Simulink Gateway, SCADE Suite and SCADE Lifecycle.	<b>Year:</b>	2015	<b>Duration:</b>	36 h.
<b>Course/Seminar</b>	Negotiation Skills	<b>Year:</b>	2012	<b>Duration:</b>	14 h.
<b>Course/Seminar</b>	Project Management Professional: 60 PDUs	<b>Year:</b>	2008	<b>Duration:</b>	40 h.
<b>Course/Seminar</b>	LynxOS-178	<b>Year:</b>	2006	<b>Duration:</b>	16 h.
<b>Course/Seminar</b>	ARINC 653	<b>Year:</b>	2005	<b>Duration:</b>	8 h.
<b>Course/Seminar</b>	Stood tool	<b>Year:</b>	2005	<b>Duration:</b>	8 h.
<b>Course/Seminar</b>	Introduction to Software Safety and Dependability Engineering, at DEIMOS Space (course given by SoftWcare)	<b>Year:</b>	2004	<b>Duration:</b>	8 h.

### Another Data

Presentations/  
Publications/  
Papers

**A HW-SW CO-DESIGNED SYSTEM FOR THE LUNAR LANDER HAZARD DETECTION AND AVOIDANCE BREADBOARDING**

Pedro Palomo, Antonio Latorre, Carlos Valle, Sergio Gómez de Agüero, Miguel Hagenfeldt, Baltazar Parreira, Almudena Lindoso, Marta Portela, Mario García, Enrique San Millán, Yuri Zharikov, Luis Entrena. DASIA 2014

**An Integrated and Cost-Effective Simulation Tool for GNSS Space Receiver Algorithms Development**

João S. Silva, Hugo D. Lopes, Tiago R. Peres, José M. Vasconcelos, Maria M. Coimbra, Pedro Freire, DEIMOS Engenharia. Pedro Palomo, Juan Pérez, José A. Pulido, DEIMOS Space. Alberto Garcia, Josep Roselló, European Space Agency. ION GNSS 2013

**A Lightweight Communication Protocol for Embedded Systems.**

Antonio Latorre, José A. Pulido, Carlos Valle, Juan Pérez, Sergio Gómez de Agüero y Pedro Palomo. DASIA 2012.

**AEROFast: Functional and Real-Time Simulation for Aerocapture GNC Assessment.**

Miguel Hagenfeldt, Andrea Mafficini, Vicente Fernández, Sergio Gómez, Carlos Valle, Pedro Palomo, Antonio Latorre. Workshop on Simulation & EGSE Facilities for Space Programmes, SESP 2012

**Mars Pre-aerocapture GNC functional and real time performance**

Andrea Mafficini, Miguel Hagenfeldt, Carlos Valle, Pedro Palomo, Sergio Gómez, Luis Penin, José Manuel Rebordão, João Dinis.

AIAA Guidance, Navigation, and Control Conference , August 15, 2012

**Galileo "Message Generation Facility" – Safety-critical and Real-time.** Antonio Latorre, Adrián Mora, Pedro Palomo, Tomás Suarez, Mike Rennie. DASIA 2008

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**Awards and Prizes**

2nd place in the contest ADA-Spain, 2002, with work: Making the ORK's porting (Open Ravenscar Real Time Kernel) for space applications, from microprocessor ERC32 (SPARC V7) to i386-PC platform.

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