

## Proposal of Seminar

1. **Title: A Method and a Tool for Architecting Real Time Software Systems**

2. **Name and affiliation of speaker + short bio**

**Speaker:** José L. Fernández

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**Short Bio:**

Jose L. Fernandez has a Ph.D (Hons.) in Computer Science, and an Engineering Degree in Aeronautical Engineering, both by Madrid Technical University (UPM).

He has over 25 years of experience in industry as system engineer, project leader, researcher and department manager. He was involved in projects dealing with software development and maintenance of large systems, specifically real-time systems for air traffic control, power plants Supervisory Control and Data Acquisition (SCADA), avionics and cellular phone applications.

During 1993, he was visiting scientist at the SEI, Carnegie Mellon University, Pittsburgh, USA.

Currently, he is consultant, researcher and part time professor at the Industrial Engineering School of the Madrid Technical University (UPM). His areas of interest are systems engineering, real-time systems, software engineering, CASE tools and project management.

He is the author of the PPOOA architectural style for real-time systems implemented as an add-on in Microsoft Visio CASE tool.

He participated as author in the book, "Business Component-Based Software Engineering", Kluwer Academic Publishers, Boston, October 2002. He has published more than 30 papers in conferences and workshops.

Selected for inclusion in Who's Who in the World and Who's Who in Science and Engineering.

### **3. Abstract**

PPOOA, Process Pipelines in Object Oriented Architectures, is a software architecture style for concurrent real-time systems. PPOOA proposes a vocabulary of components and coordination mechanisms to be used in software architecture design.

The Unified Modelling Language (UML) metamodel was extended to include PPOOA building elements. PPOOA is implemented as an add-on of Microsoft Visio CASE tool.

The PPOOA Architecting Process, named also PPOOA\_AP, can be included as a part of the general software development process. As a part of this general process, it takes some inputs from the analysis phase and produces some outputs to the detailed design phase.

PPOOA eases system responsiveness assessment. Responsiveness is a critical quality attribute of real-time systems. It is related to the response time to stimuli (events) either external or internal to the system. Rate Monotonic Analysis (RMA) is an analytical method that can be used for the assessment of system responsiveness of PPOOA architectures.

PPOOA has been used in aerospace, robotics and industrial process monitoring systems.

The goal of the seminar is present PPOOA as a complete solution for architecting real-time systems. We mean a complete solution that supporting a vocabulary of building elements, a process for architecting a new real-time system, and a CASE tool, that will be presented to the audience. The models developed using PPOOA-UML notation and tool, allow schedulability evaluation using analytical techniques such as RMA (Rate Monotonic Analysis).

#### **4. Target audience**

System and software engineers developing systems, where timing properties are a main concern.

Understanding of basic UML notation is required

#### **5. Duration: 2 days**

#### **6. Seminar outline**

- Real Time Systems concepts and characteristics
- PPOOA, an architectural style for real-time systems
- PPOOA building elements.
- PPOOA architecting process. Main process and subprocesses steps.
- Guidelines for architecting RTS
- Some real-time patterns represented in PPOOA-UML
- PPOOA-Visio. The CASE tool. Features and capabilities
- Evaluation of real-time system architectures using Rate Monotonic Analysis
- Example of architecture and evaluation of a real-time system

#### **7. Location: To Be Determined**

#### **8. Maximum number of participants: 15**

**9. Training material**

- An annotated copy of seminar slides (in printed format)
- PPOOA\_ Architecting Process Manual (in pdf format)
- PPOOA\_Visio tool
- An example architecture to be developed with PPOOA building elements and notation (a Visio file)
- PPOOA-Visio User Manual (in pdf format)

**10.Price: To Be Determined** Euros (VAT not included)