

# Ruppi Martino

## Skills

### *Hardware*

Designing and testing of electronic multilayer boards.  
Designing application on FPGA, Actel, Xilinx, Altera.

### *Optical system communications*

Single mode, multimode and plastic fibres, laser, sensor, Add and Drop, WDM (Wavelength Division Multiplexing) systems and instrumentation for optical characterization. Visible wavelengths transmission on fiber optics. Assemblage of optic connector and splicing.

### *System communications*

Serial (RS232, I2C, RS485, MODBUS) and SDH (Synchronous Digital Hierarchy), SONET (Synchronous Optical NETworking), GPS (Global Position System), IRIG (Inter-Range Instrumentation Group), NTP (Network Time Protocol) protocols, LT1 (Transaction Language 1) .

### *Programming Languages*

Fortran, Pascal, LabView, MatLab, Visual Basic, C/C++, Java, VHDL.

### *Lab Instrumentation*

Signals generators, lasers, optical multimeters, digital oscilloscopes, remote control multimeters, optical and RF switch, TDC (Time to Digital Converter), PRC (Primary Reference Clock), OSA (Optic Spectrum Analyzer), OTDR (Optic Time Domain Reflectometer), Data Analyzers and Performance Testers.

### *Managing*

Project managing, qualification and validation documentation, specification definition.

# Professional Experience

*March 2003 – February 2008*

*SCM Test – ANTARES project (international collaboration for Undersea Neutrino Telescope)*

*Testing, designing of automatic test bench*

## **Context**

Particles Physic Research

## **Objectives**

Testing of SCM electronic modules

Evaluation of causes of failure in order to supply scientific equipment under the sea for scientific applications

Suggestion of a new design to fulfill the requirements

## **Approach and solution**

Designing of Test Bench with friendly SW interface useful to technician operator.

## **Technical env**

Submarine applications.

## **Results**

All the SCM modules produced are full functional.

*March 2004 – February 2008*

*MLCM Test – ANTARES project*

*Testing, designing of an automatic test bench*

## **Context**

Particles Physic Research

## **Objectives**

Testing of MLCM electronic modules

Evaluation of causes of failure in order to supply scientific equipment under the sea for scientific applications

Suggestion of a new design to fulfill the requirements

## **Approach and solution**

Designing of an automatic Test Bench with friendly SW interface useful to technician operator.

## **Technical env**

Submarine applications.

## **Results**

All the MLCM modules produced are full functional.

Found some improvements to speed up the fiber integration of the modules

*June 2004 – June 2005*

*BACKPLANE BOARDS – ANTARES project*

*Designing LCM, MLCM and SCM backplane multilayer boards*

## **Context**

Particles Physic Research

## **Objectives**

Produce boards to simplify the integration phase of the modules.

Link the functional boards of the module in agreement with the different format of the signals (LVTTTL, LVDS, RS485)

Receive and distribute the voltages and grounding to all the boards

**Approach and solution**

Splitting the signals in different layers

Using diffuse layers and signals layers alternatively

Sizing the diffuse layer for power and grounding

Assure the grounding in several low resistance points

**Technical env**

Submarine applications.

**Results**

The designs was successfully tested by pre-production and it has followed the mass production

*January 2004 – December 2005*

*Local Quality Supervisor – ANTARES project*

*Quality management system for local integration site*

**Context**

Particles Physic Research

**Objectives**

Definition a process of improvement for local integration site

Assuring a process of production of working MLCM and SCM modules in agreement with the time schedule

Interfacing of the local quality system with the quality management system of the project

**Approach and solution**

definition of documents and tools to assure the objectives

definition of written procedures for integration activities of SCM and MLCM modules

definition the local quality plan

promotion and definition the DB of the experiment

definition the rule of traceability

**Technical env**

Submarine applications.

**Results**

All the quality processes stable

*January 2007 – February 2008*

*Quality Auditor – ANTARES project*

*Contribution to quality control for whole project level*

**Context**

Particles Physic Research

**Objectives**

Define a process of improvement for the project

Assure a process of implementation of the apparatus in agreement with the time schedule

**Approach and solution**

Using of audit to check and verify the capability of the sites and the agreement with the rule of system quality management

**Technical env**

Submarine applications.

**Results**

Audits in the sites of collaboration: Valencia (Spain) and Marseille (France)

*November 2004 – December 2004*  
*Controlling HV of TRD – PAMELA Satellite Detector*  
*Improving the previous system*

**Context**

Particles Physic Research

**Objectives**

Improve the DC-DC controlling  
Create a smooth ramp to turning on the HV

**Approach and solution**

Using an accurate DAC for the input of DC-DC converter  
Calibration of the answer of system  
Using coding to avoid peaks in stepping up and down

**Technical env**

Space applications.

**Results**

prototype still working

*June 2003 – December 2006*  
*Timing Calibration – NEMO phase1 (Neutrino Telescope prototype, italian collaboration)*  
*Designing, implementation and testing of the system*

**Context**

Particles Physic Research

**Objectives**

Measurements of time offsets of the optical sensors with resolution of 1 ns

**Approach and solution**

Illumination of the sensors at time known from same sources  
Using optical fibre network to deliver light pulses  
Extraction the time offsets from DAQ system

**Technical env**

Submarine applications.

**Results**

The system is full functional

*September 2005 – December 2006*  
*Clock and timing distribution – NEMO phase1*  
*Designing, implementation and testing of the system*

**Context**

Particle Physics Research

**Objectives**

Low jitter clock distribution to the whole apparatus  
Distribution of the absolute time for slow control and data acquisition processes

**Approach and solution**

Using low jitter fan out clock chips  
Master clock derivate from GPS receiver  
Decoding IRIG protocol and sending of data frame by FPGA  
Remote monitoring and alarms management

**Technical env**

Shore station

**Results**

The system is currently working

*January 2007 – February 2008*

*Timing Calibration – NEMO phase2 (Neutrino Telescope upgraded prototype)*

*Designing, implementation and testing of the system*

**Context**

Particles Physic Research

**Objectives**

Measurements of time offsets of sensors with resolution of 1 ns

**Approach and solution**

Illumination of the sensors at time known

Using electrical cables to deliver the pulse commands

Measurement of the time delay of the cables from embedded system

Echo signal and remote control realized by FPGA and CPLD

Extraction the time offsets from DAQ system

**Technical env**

Submarine applications.

**Results**

The system has completed the prototyping phase

*March 2008 – now*

*Test designing and implementation of xWDM for Alcatel-Lucent 1850TSS320*

**Context**

Alcatel – Lucent, Vimercate (Milan)

**Objectives**

Designing and implementation test of R.3 managing SW

**Approach and solution**

Scripting tools

Splitting functionalities

Working in harness with SW developers

**Technical env**

High speed data optical switch apparatus

**Results**

Activity under development

# Education

PhD in Electronic Engineering

Polytechnic of Bari

Year: 2008

Thesis title: "Timing Calibration System of the NEMO Phase 1 apparatus"

Master Degree in Electronic Engineering.

Polytechnic of Bari

Year: 2001

Vote: 108/110.

Thesis title: "Design and test of a Test Bench for String Control Modules (SCM) for ANTARES Experiment"

Languages

Italian (native);

English (advanced level);

Russian (intermediate level);

French (beginner level).

Winner of check for the collaboration to search activity n. 8178 in reference to research program: "Design and test of sensor synchronization system of Neutrino Telescopes", University of Bari.

Attended Seminars and Courses

2007: Digital Signal Processing School organized by CERN Accelerator Group, Sigtuna (Svedish);

2006: Advanced Training Course on FPGA Design and VHDL for Hardware Simulation and Synthesis, ICTP (International Centre for Theoretical Physics) and INFN Trieste;

2006: Course for Auditor for Quality Management System of ANTARES experiment, organized by Bureau Veritas Group;

2005: Course on "Management Quality in Experimental Physics", organized by INFN Bari and RINA Industry S.p.A.;

2004: Course on "Quality Management" organized by RINA Industry S.p.A.;

2001: Special License of Radioamatory N. 6025/BA/W, certificated from Italian Ministry for Communication.

1999-2000: Visual Basic advanced courses

1999: Internet Course of "Fuzzy Control", certified by the Technical University of Denmark.