

### *Career Summary*

Independent embedded systems engineer consultant from 2005. I can work in different roles: senior software engineer, technical architect, team leader.

My latest works in reverse time order are:

- Prisma Engineering Srl: WCDMA/FDD physical layer on multi-DSP embedded board (Texas Instruments DSPs and 3 FPGAs);
- Altay Scientific Spa: Embedded firmware for touch screen hand held probes (Embedded custom lightweight OS with UI);
- Nokia Siemens Networks NE (network element): OS core team developer (Linux), BSP, Toolchain;
- Same Deutz Fahr Spa ECUs BIOS for firmware update (Keyword 2000 protocol based, CAN-BUS, RS-232);
- Same Deutz Fahr Spa tractors and combines on-board display (PPC board/Linux/QT embedded);
- Galileo Avionica Spa 2D radar image rotation and compensation algorithm design and implementation on IBM bladecenter CELL processor based system (PPC 64bit/ 16 cores / Linux)
- Selex Sistemi Integrati Spa brushless motors control design and implementation (CANOPEN based servo, LynxOS)

### *Education Summary*

- ✓ **1989-1994 Liceo Scientifico Leonarda da Vinci**, Milan, Italy  
**High School**, Scientific studies, grade 60/60
- ✓ **1994 Phyllips Exeter Academy**, Exeter, New Hampshire, US  
**Summer School**, Physics/Math, English, Turbo Pascal
- ✓ **1994-1999 Politecnico di Milano**, Milan, Italy  
**Master Degree**, Computer Science, grade 98/100
- ✓ **2003 University of California**, Berkeley, United States  
**Visiting Fellow**, Hw/sw codesign environment called metropolis led by Prof. Sangiovanni Vincentelli.
- ✓ **2004-2006 Politecnico di Milano**, Milan, Italy  
**PhD**, C++ based software framework for hw/sw codesign of embedded systems
- ✓ **2009 Lattice FPGA workshop**, Milan, Italy  
**1 week** of course for FPGA programming

## *Skills*

I'm a senior solutions architect with long term international and multicultural experience in multiple projects ranging from low level design and development of embedded systems to high level UI involving latest cutting edge technologies.

- Object oriented programming;
- Programming languages: C, C++, C#, Java, Turbo Pascal, Visual Basic;
- Assembly languages (x86, x86-64);
- Frameworks: MFC, .NET, QT, WPF, Silverlight;
- Linux kernel internals (RTAI x86\_64 patch contributor);
- Linux device drivers (CAN bus, custom hardware);
- Linux protocol stack development (added SAE-J1939 protocol to linux new CAN device support work made by Volkswagen)
- Protocols: automotive (Keyword 2000, can-bus), manufacturing machines (canopen), tcp/ip, udp, icmp;
- Embedded/custom OSes, BIOSes, bootloaders for the following architectures: Arm 7, Arm 9, C167-CS, x86, x86\_64, Microchip 16bit/32bit microcontrollers;
- Knowledge and implementation of databases (SQL server, Mysql)

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### ***(2010-2011) WCDMA/FDD Physical layer on a multiple DSP board***

Currently I'm developing the physical layer of a 3G platform aiming to simulate a high number of UE. The hardware platform is a custom made board developed by Prisma Engineering Srl endowed with a number of FPGAs to acquire synchronization and cell search and a number of DSPs from Texas Instruments in order to execute spreading/despreading/multiplexing and channel coding.

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### ***(2010) Touch screen probes***

A custom made touch screen system along with a an embedded OS / graphic library has been developed to create a system able to acquire physical measurements from different probes. The touch screen device used a Microchip 32bit microcontroller while the probes used a 16bit microcontroller. In order to guarantee firmware updates a custom light bootloader has been developed.

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### ***(2010) Brushless motors servo control***

The control board runs LynxOS real time system and connects to the servo control system throughout can bus. The used protocol is CANOPEN. In order to fully control the two servo motors a PMC board has been developed carrying two can bus controllers. A high level library has been written such that an existing software using a proprietary system can now control the motors without changes. A GUI frontend has been developed in QT to simulate motors trajectories.

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### ***(2010) Radar 2D image rotation and compensation algorithm***

Given specifications of a 2D image rotation and compensation algorithm I've implemented the algorithm in order to fully gain access to the power of IBM bladecenter BE CELL system (2 PPC processors and 16 SPEs)  
The algorithm is implemented in C and uses GNU cross-toolchain developed by IBM.

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### ***(2010) Multi-touch UI***

A C#/Silverlight web application has been developed suited to be used in Microsoft Surface System and placed in Hospitals for Medical purposes.

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### ***(2008-2009) Linux Kernel***

An ad-hoc Linux kernel for Nokia Siemens NE has been developed with these key features:

- redundancy (a memory area reserved to the OS is cross copied among the boards)
  - high availability (watchdog mechanisms, tracers, ad hoc keepalive systems)
  - lightweight (small OS footprint)
  - real time
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### ***(2007-2009) Diagnostic tools, ECU boot loaders and flashers***

For Same Deutz Fahr Spa, OEM Srl and Acoustic Systems Srl have been developed the following tools:

- keyword 2000 protocol based flashers and diagnostic tools (both ECU and PC software endpoints). These systems are based on CAN bus and RS232 physical lines.
  - CCP library over can bus
  - boot loaders for ARM7/9 Infineon C167CS boards
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### ***(2007-2008) QT Embedded Display***

For Same Deutz Fahr Spa a Linux based PPC distribution has been developed along with an ad-hoc UI based on QT Embedded (<http://www.imonitor-tractors.com>)

The overall system allows access to core tractors and combine functions thus it communicates through can bus with other ECUs. In order to fully exploit the information present in the can bus an ad hoc protocol (SAE-J1939) has been added on top of CAN RAW protocol stack.

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### ***Past (1991-2007)***

- High school: C++ plot software, symbolic math derivative algorithm;
  - During university studies: Visual C++ (MFC) CAD/CAM software for wood cutting machines
  - Optimization and stocks management (Microsoft Access DB); edge detection UI in Visual C++; multimedia CD-ROMs (4 CDs) in Macromedia Director (now Adobe);
  - Vodafone Spa (Java object oriented DB);
  - IBM Italy Spa (DB and data mining);
  - Tiscali Spa (Unix cluster server developed along with different clients for instant message service – windows client, win CE client, SMS client);
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### ***Projects experience***

I've a long experience in team development ranging from few developers to hundreds involving different departments: comfortable use of CM systems such as Rational Clearcase, GIT , SVN and CVS.

### ***Hobbies***

When I'm not sitting in front of my laptop one of the things I love most is riding my mountain bike in the summer or climb mountains with alpinism skies in winter.