

## **Tim Colgan**

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this resume also available at: [http://tcolgan.freeshell.org/TimColgan\\_resume.pdf](http://tcolgan.freeshell.org/TimColgan_resume.pdf)

### **SOFTWARE ENGINEER (EMBEDDED SYSTEMS)**

Firmware/software development from low-level to GUI. Unique combination of experience including applications in Communications, Control Systems, and Signal Processing. Strong math and analytical skills. Extensive hardware knowledge. Self-motivated and goal-oriented. Hands-on problem solver.

### **EXPERIENCE OVERVIEW:**

- C/C++, Python, Perl, C#, MFC, Visual Basic, LabWindows.
- Unix/Linux/VxWorks/QNX/Windows/DOS.
- Embedded system development, with several RTOSs.
- ARM, MIPS, PowerPC, 80x86 family, 80C31, 68HC11, 320C25 (DSP), 80186.
- Communications programming (WCDMA, TCP/IP, Ethernet, FibreChannel, sockets, serial port, parallel port, RS485, Arinc 429, MilStd 1553).
- Data Acquisition. DSP (filtering, digital control, spectrum analysis).
- Simulation and mathematical processing of data. Matlab/Simulink/Mentor.
- Vision systems. Acquisition, processing of images.
- Graphical User Interfaces (GUIs).
- Device Driver development/Low-Level Software (interfacing to ASICs, DMA, DACs, ADCs, etc.).
- Object-Oriented Design.
- Graphics programming. Plotting and visualization of data.
- Control Systems Design/Programming - Motion, Servo-hydraulic, Pressure, Temperature, PID.
- Knowledgeable in use of Logic analyzers, In-circuit emulators, Oscilloscopes, Network Analyzers. Debug to gate level including SOC/FPGA testing using Mentor/Carbon simulation.
- Foreign languages - Fluency in Spanish and Italian. Studying German.

### **EDUCATION**

- MS Electrical Engineering - University of Massachusetts (Lowell) 1986. Project topic - PID control. GPA 3.8.
- BS Electrical Engineering - Pennsylvania State University. 1982. GPA 3.3.
- Completed coursework and preliminary exams for PhD in Electrical Engineering in Control Systems - University of Minnesota. Concentration - DSP and Control Systems. GPA 4.0.
- Additional classes and seminars - C++, MFC, Windows SDK, FieldBus, DSP Design, Process Control. QNX. Galil Motion.
- Trade Shows/Conferences Attended - Acoustics Speech and Signal Processing (ASSP), Embedded Systems Conference, Instrument Society of America (ISA), American Control Conference (ACC).

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## WORK HISTORY

Tim Colgan

- 2006 - Present **Colgan Consulting, Inc.**; 237 Dean St., West Chester, PA 19382. (484) 888-9972.

Wrote embedded software for SOC/FPGA testing of WCDMA circuitry. Gate-level hardware debug using Mentor (Quarta/Codelink) and Carbon simulation/debug tools. MIPS/ARM/DSP coding. Signal tracing through WCDMA telecom protocol. Additional embedded project using ARM processor (NXP LPC2478) with open source tools (GCC/Eclipse/Olimex Debugger). Embedded development on linux-based Packet Flow Switch (Fiber Optics).

- 2003 - 2006 **Innovative Solutions & Support**; 720 Pennsylvania Drive, Exton, PA 19341 USA. (610) 646-9800.

Embedded programming for avionics systems (flat panel displays). Subsystem programming including display software, communications (Arinc 429, Ethernet, serial), flash memory. Wrote Windows simulation software for generating inputs via Ethernet channel (use of WinPCap and Ethereal). C/C++. Full design and documentation according to FAA DO-178B including structural coverage (using Rational Real-Time) and requirements-to-code traceability.

- 1997 – 2003 **SEAcorp, Inc.**; 4211 Oregon Avenue North; New Hope, MN 55428. (612) 750-1918

Worked on several projects including PowerPC/VxWorks based RAID controller, circuit board inspection system (using the QNX RTOS), hydraulic control system, plotting and communication routines for a medical instrument, control panel applet for a portable computer docking station and a motion control board configuration program. Several front-end programs in C++/MFC and Visual Basic. Low level programming for motion control, image processing, communications. Sockets programming. PCI bus interfaces (low-level software). Set up Linux based web server.

- 1993 – 1997 **Tescom Corporation**; 12616 Industrial Blvd. Elk River, MN. 55330. (763) 241-3349

Wrote real-time software (in C) to perform PID control of pneumatic pressure controller (68HC11 based). Algorithm was configurable to perform cascade control. Included RS485 interface to supervisory computer (developed master/slave packetized network protocol with error checking - CRC). Designed user interface with graphical LCD display and infrared receiver. Windows based user interface. Program allowed for configuration of programmable variables and provided real-time graphical display of system response for tuning of the PID parameters. Wrote Windows DLL to handle communication protocol. Wrote sample programs in C++, C, Visual Basic, LabVIEW and LabWindows/CVI. Wrote PID simulation program. Developed PC based manufacturing system utilizing D/A, A/D and DIO boards and controlling an oven to perform transducer linearization and temperature compensation.

- 1989-1993 **Interlaken Technology Corp.**; 7600 Golden Triangle Drive ; Eden Prairie, MN. 55344. (952) 942-7499

Designed digital servo-hydraulic multi-axis PID controller based on the 320C25 DSP (competitor's survey found that customers rated our controller the best on the market). Each axis of control had feedback selectable from one-of three sources (load, displacement, strain). This required development of a bumpless mode switch. Designed processor board, and transducer interface modules (LVDT, strain gauge and servo driver). Wrote assembly code for 320C25. Wrote prototype user interface software (graphical DOS program).

- 1988-1989 **MikroTel**; Golden Valley, MN.

Worked on design of 80C31 based electrical meter design using power-line carrier communication.

- 1985-1988 **Fenwal Inc.**; Ashland, MA.

Worked on 68008 based digital PID temperature controller. Designed RTD and thermocouple interface. Designed RS232 communication module utilizing 80C31 microcontroller.

- 1984-1985 **Facit, Inc.**; Merrimack, NH.

Worked on design of dot-matrix printer. Wrote test code for 80186 processor. Developed stepper-motor drive circuitry and firmware control. Supervised layout and manufacture of boards. Debugged final system.

- 1982-1984 **Cosideco, Ltda.**; Quito, Ecuador.

Worked with S100 based microcomputers. Installed, maintained and repaired computers. Taught programming class.