

WILLIAM S. ALEK

SENIOR SOFTWARE ENGINEER

SPECIALIZING WITH REAL-TIME EMBEDDED CONTROL SYSTEMS

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EMPLOYMENT EXPERIENCE:

MICROPROCESSORS, MICROCONTROLLERS & CPLD – ispMACH 4256ZE CPLD, 8051F121 & 8051F342, dsPIC30F6011A, TMS320F2810, MPC5554, 68HC908, Atmega8, 68000/030/332, PowerPC750, Z80/180, 80x86, 80C196, 8085, SIEMENS 80C167.

PROGRAMMING LANGUAGES & API INTERFACE – Verilog 2001, ANSI-C, Visual C/C++ 2008, GNU C, ByteCraft C Compiler for eTPU, COSMIC C, MICROTEK C/C++, Z-WORLD Dynamic C w/RTOS, WIN32 API, BORLAND C/C++, 80x86 Macro Assembler, Visual BASIC 6.0, SIEMENS C167, Vector Informatik CAPL, INTEL C96 with in-line Assembler.

DEVELOPMENT WORKSTATIONS - Windows XP/NT/98/95/3.11/3.1, Red Hat Linux, Sun UNIX Workstations, HP & HP/APOLLO UNIX Workstations, VAXstation 3100/M38 w/DECwindows, VAXstation 2000, various terminals (i.e., VT100, VT320).

OPERATING SYSTEMS & GRAPHICAL ENVIRONMENTS – RTOS (Dynamic C), MS Windows XP/NT/98/95/3.1, MS-DOS 6.2x, Wind River VxWorks 5.4, Solaris (UNIX), OS-9, HP-UX9.0, HP/APOLLO Domain/OS w/UNIX Bourne/Korn Shell.

TEXT EDITORS / WORD PROCESSORS – MPLAB IDE v8.14, TI Code Composer Studio v3.3, Eclipse 3.0, Borland CodeWright, UNIX EMACS and vi, Brief 3.1, Borland IDE, Microsoft IDE, Microsoft Office (Word, Excel, etc), WordPerfect, Framemaker, Interleaf, VAX LSEdit, EDT EVE Plus, and Alter.

EMULATORS, DEBUGGERS, & SIMULATORS – Spectrum Digital XDS510 USB JTAG Emulator, Ashling Vitra for MPC5554, Atmel AVR ICE40, Wind River Tornado debugger, MOTOROLA 68HC05/08, Kontron 80C167, INTEL ICE196KC/KB, and MetaICE52 by MetaLink, 80x86 debuggers by Microsoft and Borland.

OTHER TOOLS – Synplify Pro for Lattice, ispLEVER Classic, IVEX WinDraft and WinBoard, Configuration Management/Version Control using Rational ClearCase, Bug Tracking using ClearQuest and DDTs, Cadre Teamwork Data Flow, Software Design implementing Yourdon, Nassi Schiederman, Hatley Pirbhai Design Methodologies, and State Transition Diagrams.

EMPLOYMENT EXPERTISE:

Real-time Embedded Control Systems: DO-178B, Real-Time Embedded Cyclic Control Executives and Operating Systems (RTOS), Controller Area Network (CAN) Communication Standards used in the transportation industry, Diesel Engine Controls, Flight Control Dynamics, Aircraft Engine Controls, Allen-Bradley SLC5/03, PLC5/3 PLCs; State Machine Design, Digital Signal Processing, PID Control Regulators, Data Acquisition (A-to-D Sampling), 2D/3D Mapping Interpolation, Digital Filtering, Integer / Fixed-Point Math Calculations, PWM D-to-A Output Processing; Structured Programming Techniques, Data/Control Flow Methodologies, Object-Oriented Design Programming Techniques; High-Speed / Low-Power Logic Design, Pneumatic / Hydraulic Interface Design, Audio Signal Processing, Switching Power Supply Design, Motion Controls, Single-Point Grounding, EMI Suppression, and Transmission Line Theory.

EDUCATION:

DEGREE: Illinois Institute of Technology, Chicago, Illinois. Bachelor of Science in Electrical Engineering with a Computer Science Minor, August 1979.

MOST RECENT EMPLOYMENT HISTORY:

Jan. 2011 to present – SOFTWARE / HARDWARE ENGINEER/CONSULTANT – Scottsdale, Arizona. Performed software / hardware development engineering for R & D industry. Designed and tested high-speed frequency capture circuit for measuring torsion field effects using high precision. Used Lattice Semiconductor ispMACH 4256ZE CPLD clocked at 125 MHz and programmed in Verilog 2001 using Synplify Pro and ispLEVER Classic. Captured frequency data was transmitted to PC using high-speed USB interface and displayed graphically on PC using Visual C/C++ 2008.

July 2010 to Nov. 2010 - SOFTWARE ENGINEER/CONSULTANT – Verification & Validation for Honeywell, Deer Valley, Arizona. Performed software verification & validation oversight of flight control software for the Boeing 787 Dreamliner program. DO-178B Compliant and FAA Level A Software.

June 2009 to July 2010 - SOFTWARE ENGINEER/CONSULTANT for IRD Balancing, Louisville, Kentucky. Performed software engineering design & development for a rotary balancing instrument. Designed, wrote and tested ALL of the control software for this real-time embedded project. This includes high-speed A-to-D conversion w/ auto gain control, operating range between 30 rpm to 80,000 rpm, fast SPI data transfer and high-speed USB data transfer. This software was targeted to the 8051F121 & 8051F342 Microcontrollers using ANSI-C programming language in Silicon Labs IDE.

July 2008 to Dec. 2008 – SOFTWARE ENGINEER/CONSULTANT for Binsfeld Engineering, Maple City, Michigan. Performed software engineering development for a rotary temperature transmitter for heated godet rolls. Designed, wrote and tested ALL of the control software for this real-time embedded project. This includes PID control loops and two CANopen channels. This software was targeted to the dsPIC30F6011A Digital Signal Processor using ANSI-C programming language in MPLAB IDE.

January 2008 to April 2008 – SOFTWARE ENGINEER/CONSULTANT for GE Aviation, Rockford, Illinois. Performed software engineering development for the Air Management System of the Embraer Phenom 300 Executive Jet. Designed, wrote and tested the main control loop executive. Developed main loop timing. This software was targeted to the TI TMS320F2810 Digital Signal Processor using ANSI-C programming language in TI Code Composer IDE. DO-178B Compliant and FAA Level A Software.

Feb. 2006 to Oct. 2007 – SOFTWARE ENGINEER/CONSULTANT for Hamilton/Sundstrand, Rockford, Illinois. Performed software engineering development for the Generator Control Unit of the Boeing 787 Dreamliner. This project was a real-time embedded control application providing software development for the eTPU (Timing Processing Unit), the eQADC (Analog/Digital Converter), and the eMIOS (I/O Subsystem) built into the Freescale MPC5554 32-bit microcontroller using the ANSI-C programming language, ByteCraft C Compiler for the eTPU, and the Eclipse/GNU C development platform. DO-178B Compliant.

March 2005 to May 2005 – SOFTWARE ENGINEER/CONSULTANT for X-Rite, Grandville, Michigan. Designed, wrote and test data encryption/decryption software for a color scanner for the high speed printing industry. This software was targeted to the Rabbit R3200/Z80 microcontroller using the Dynamic-C programming language w/RTOS.

June 2004 to Dec. 2004 – SOFTWARE ENGINEER/CONSULTANT for Herman Miller, Holland, Michigan. Performed software engineering design and development of an intelligent track lighting system using distributed Atmel microcontrollers. This software was targeted to the Atmel Atmega8 microcontroller using the AVR ANSI-C and Assembler programming language.

March 2004 to April 2004 – SOFTWARE ENGINEER/CONSULTANT for Marathon Sensors, Cincinnati, Ohio. Designed, wrote and integrated a PID (Proportion-Integration-Derivative) control algorithm for a temperature controller shown below. This software was targeted to the Motorola 68HC908AS60 microcontroller using the ANSI-C (Cosmic C) programming language.

Sept. 2003 to Dec. 2003 – SOFTWARE ENGINEER/CONSULTANT for Pollak EPD, El Paso, Texas. Performed software engineering design and development of dashboard electronic gauges and instrument clusters. This project was a real-time embedded control application. Target was a 16-bit microcontroller using the Borland C/C++ compiler tools.

Dec. 2002 to July 2003 – SOFTWARE ENGINEER/CONSULTANT for Marathon Sensors, Cincinnati, Ohio. Performed software engineering design and development of a temperature controller. This project was a real-time embedded control application using a custom designed control executive, digital filter techniques, PID algorithms, thermalcouple table lookup and interpolate, targeted to the Motorola 68HC908GP32 microcontroller, and the ANSI-C (Cosmic C) programming language.

March 2001 to Nov. 2002 – SOFTWARE/HARDWARE ENGINEER/CONSULTANT for M. Richter Associates, O'Fallen, Illinois. Performed hardware and software engineering design and development of an alternative energy switching power supply. This project was a real-time embedded control application using a custom designed control executive, digital filter techniques, targeted to the Motorola 68HC908GP32 microcontroller, and the ANSI-C (Cosmic C) programming language. The application also required the pc-board hardware design using the IVEX WinDraft and WinBoard circuit board development tools. I designed hardware and software, built and delivered two working prototypes to the client.

Sept. 2000 to March 2001 - SOFTWARE ENGINEER at MOTOROLA CIG, Arlington Heights, Illinois. Performed software engineering development of EDGE GSM-based Digital Cell Phone Base Station. This project required porting of existing software from a custom RTOS to VxWorks 5.4 RTOS. The system is programmed in the C-Language, targeted to the PowerPC 750 microprocessor, and developed on UNIX platforms using ClearCase Configuration Management System.

July 1999 to June 2000 - SOFTWARE ENGINEER at MOTOROLA AIEG, Northbrook, Illinois. Performed automated software engineering development of automotive door controllers for Saab. This project was a real-time embedded control system using the Motorola 68HC08 microcontroller, C language, and developed on a pc-based Windows NT platform with ClearCase, DDTs, and Teamwork Data Flows. Also, developed and maintained software test models using Vector Informatik CANoe Test Tool, which used a C-like event driven language called CAPL.

Mar. 1999 to June 1999 - SOFTWARE ENGINEER at SEMS Inc, Valparaiso, Indiana. Performed software development engineering of X-Ray Metal Thickness Gauging Systems for the metal processing industry. Responsibilities included adding new software-based functionality to Gauges interrupt handlers using 8086 Macro Assembler, improved the Gauge accuracy using digital filter techniques, developed a real-time Gauge Data Collection System using Visual BASIC, programmed Classifier Systems using Allen-Bradley SLC5/03 PLCs. Used a variety of platforms including DOS, Windows 3.1, and Windows 95. Also, performed some SCO-UNIX system administration functions with company computer.

Mar. 1998 to Feb. 1999 - SOFTWARE/HARDWARE ENGINEER at SIMS Professional Engineers, Highland, Indiana. Performed software design and development engineering of a unique liquid-based CO₂ refrigeration control system for a railroad car company, GATX. This project was a real-time embedded control application using a small custom designed control executive, digital filter techniques, the Zilog Z180 microcontroller, the C programming language. The application was designed and developed on a pc-based Windows NT platform.

Aug. 1997 to Dec. 1997 - SOFTWARE ENGINEER at MOTOROLA ECSG-GSM/Core Software Development, Libertyville, Illinois. Performed software engineering development for digital cellular phones (GSM based). This project was a real-time embedded control application using the Motorola 68332 microcontroller, C/C++ programming language, and developed on an X-Terminal (Solaris - Unix) platform.

Aug. 1996 to May 1997 - SOFTWARE ENGINEER at MOTOROLA AIEG, Northbrook, Illinois. Performed software engineering development for automotive body controllers for GM and Saturn. This project was a real-time embedded control application using the Motorola 68HC05/08 microcontrollers, C language, and developed on a pc-based Windows 3.1 platform.

April 1994 to July 1996 - SOFTWARE ENGINEER at MACK TRUCKS, Hagerstown, Maryland. See description below from April 1992 to Aug. 1993.

Feb. 1994 to April 1994 - SOFTWARE ENGINEER at SIEMENS GMMASONICS, INC., Hoffman Estates, Illinois. Successively completed the initial setup of Cadre Teamwork / Object Oriented Analysis

Tool for a Gamma Ray Medical Imaging System. The design tool implemented the Shlear-Mellor Methodology running on the HP-735 Unix Workstations.

Aug. 1993 to Nov. 1993 - SOFTWARE ENGINEER at PAXALL CORP., Hayward, California. Performed software engineering development for a communication bridge between a proprietary network (PAXNET) and an Allen-Bradley PLC5 & PLC3 Programmable Controller Data Highway Network. This project used Borland's C/C++ language and a pc-based Windows 3.1 development platform. Other tasks involved the use of an HP/Apollo Unix Workstation.

April 1992 to Aug. 1993 - SOFTWARE ENGINEER at MACK TRUCKS, Hagerstown, Maryland. Performed software engineering and development of a vehicle management and control system for diesel engines. This project was a real-time embedded control application using the SIEMENS 80C167, the INTEL 80C196 microcontroller, the C language, and developed on a pc-based Windows 3.1 platform. Responsibilities include writing and testing approximately 80% of the software control modules used to control diesel engines. The control code contained PID routines using the trapezoid method, 3D map lookup and interpolations, and communication software (SAE J1587). The software design used data/control flow specifications.

Feb. 1992 to April 1992 - SOFTWARE ENGINEER at AUTOMOTION, INC., Worth, Illinois. Performed software engineering development of a communication subsystem for a conveyor control system. The work was similar to the PAXALL, CORP. job.

July 1991 to Dec. 1991 - SOFTWARE ENGINEER at CUMMINS ELECTRONICS, Columbus, Indiana. Performed software engineering of diesel truck engine control systems. This project was a real-time embedded control application using the INTEL 80C196 microcontroller, C language, and developed on a Unix platform. Other tasks involved software tool development using ANSI-C language.

Dec. 1990 to May 1991 - SOFTWARE ENGINEER at GE MEDICAL SYSTEMS Division, Waukesha, Wisconsin. Performed software engineering of clinical x-ray machine control systems. This project was a real-time embedded control application using the INTEL 80186 microprocessor, the PLM86 language, and developed on a VAX Workstation platform.

Mar. 1990 to Aug. 1990 - SOFTWARE ENGINEER at HONEYWELL FLIGHT SYSTEMS Division, Phoenix, Arizona. Performed FAA certified software engineering and testing of a flight control system for the MD11 (McDonnell Douglas commercial passenger aircraft). Responsibilities included flight control code programming, component/module test generation, and test reviews. This project was a real-time embedded control application using the INTEL 80386 and the Motorola 68020 microprocessors, the PLM386 and C languages, and developed on a VAX Workstation platform.

Feb. 1989 to Jan. 1990 - SOFTWARE ENGINEER at ALLIED-SIGNAL AEROSPACE CO. with Divisions of BENDIX/KING AIR TRANSPORT AVIONICS, Ft. Lauderdale, Florida, BENDIX ENGINE CONTROLS, South Bend, Indiana, and GARRETT AIRESEARCH, Tucson, Arizona.

July 1988 to Feb. 1989 - HARDWARE ENGINEER at DELCO ELECTRONICS, Kokomo, Indiana.

Nov. 1987 to June 1988 - SOFTWARE ENGINEER at BELL+HOWELL, Chicago, Illinois.

May 1987 to Oct. 1987 - SOFTWARE ENGINEER at SIEMENS GAMMASONICS, INC., Des Plaines, Illinois.

June 1985 to Apr. 1987 - CONSULTANT at INTALEK, INC., Hammond, Indiana.

June 1984 to May 1984 - HARDWARE ENGINEER at ROCKWELL INTERNATIONAL SWITCHING SYSTEMS Division, Downers Grover, Illinois.

Sept. 1983 to May 1984 - CONSULTANT at INTALEK, INC., Hammond, Indiana.

Jan. 1981 to Aug. 1983 - HARDWARE ENGINEER at FORMAX CORP., Mokena, Illinois.

Sept. 1980 to Dec. 1980 - HARDWARE ENGINEER at SONICRAFT, INC., Chicago, Illinois.

June 1979 to Aug. 1980 - HARDWARE ENGINEER at PROVVAR, INC., Hammond, Indiana.