

Cosgrove Computer Systems Inc.
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JOHN COSGROVE

Professional Electrical Engineer
Consultant in Computer Systems and Software

Areas of Specialization

Software Engineering Development Methods
Safety/Mission-Critical, Hardware/Software Interface
Real-Time Systems - Ada, FORTRAN, C, Assembly
Computer Data Acquisition and Control

Services Provided

Process & Project Review, Program Implementation and Performance Optimization
Forensic Engineering in Computers and Software
Project Requirements and System Design
System Integration and Troubleshooting

Experience

Over forty years of engineering experience with over thirty five years in software engineering.

MAJOR DESIGN AND IMPLEMENTATION RESPONSIBILITIES:

Determined commonality criteria and setup shared software for separate helicopter avionics projects. Also implemented an Arinc 429 driver for one of the projects using Rational Apex Ada 95 targeted for PowerPc. Performed system tradeoff and preliminary design for a forty-plus CPU on-board radar (SAR) processing system for the reconnaissance version of the F16. System used Radstone and Mercury PowerPC CPU's running C on VxWorks and Mercury OS (MCOS). Established subsystem (module architecture) structure and multi-platform board support for 40 KSLOC GPS-based aircraft navigation system. Also performed tasking optimization and real-time schedulability analysis on this GPS system which was targeted for the MIPS 4700 & 4640 CPU's. The development platform used the Rational Apex toolset and the analysis was supported by the Rational ASIS-based Ada Analyzer tools. Earlier completed system integration on a 75 KSLOC real-time pollution monitoring system for power generation stations. System is Verdex and Alsys - based Ada targeted for both SCO/UNIX and MS DOS INTEL CPU's.

Designed and implemented Ada target detection and recognition programs for a multi-processor smart munitions project. System is hosted on a Sun Sparc using SunAda (Verdex) and Tartan for a TI DSP processor in an eight CPU configuration. Processing used IR and radar sensor data and required re-engineering from C prototype algorithms and development of new classification criteria.

Developed and maintained the inter- and intra-processor communications processing for a high performance graphics display station. Redesigned communications processor to incorporate object-oriented principles which improved maintainability and subsystem integrity. Also performance-optimized the system with Rate Monotonic Analysis (RMA) techniques by modifying tasking priorities and eliminating architectural inefficiencies. System was DEC and Verdex Ada on a multi-processor (4), 68020 VME-based target, hosted by clustered Vaxes and Sun workstations over a TCP/IP network.

Using the Rational R1000 (now Apex) Ada development environment, developed the data base interfaces, device emulation and overall control executives for a object-oriented, multi-process system targeted for an IBM 370 with Alsys Ada. Designed the airborne control programs for approximately 30 integrated communication devices for the AC-130 Gunship. The flight program was implemented in an Ada object-oriented architecture, hosted on a VAX targeted for a four-CPU (1750's) computer with a four-bus, 1553-type I/O system.

Developed the message communication subsystem for an Ada object-oriented architecture, multi-CPU (68020's with VME Bus), specialized artificial intelligence application.

Developed the top level communication and control executive for a multi-processor radar imagery exploitation system on a clustered VAX 8600 networked to eight Sun workstations with Gould raster displays. Optimized and expanded the inter-process communication library used in a shared-memory, dual VAX 780 used for critical, real time SAR imagery processing.

Developed control and data acquisition software (drivers, I/O libraries and real time application code) for a wideband sensor test system consisting of several VAX 750's networked into a host 780.

Developed a general purpose software instrumentation system for real-time logging of integration test data and errors in time critical multi-processing applications (DEC PDP 11/70, VAX 780, 8600). Developed the I/O system linking high speed radar signal processors with a large scale raster display, analog tape and film recorder.

Developed and installed city-wide automatic utility meter reading systems located in telephone exchanges using time-shared standard telephone lines (awarded patents on this system).

Also developed the networking system which connected the local data concentrator installations into the central operations office for data retrieval, system upgrade and remote maintenance. System was implemented with a synchronous communications protocol linking the minicomputers over dial-up telephone lines (system provided remote diagnostic features and unattended reboot and restart.)

Developed a load management data acquisition system which provided color graphic displays of electricity usage and instantaneous demand for a citywide municipal power generating control center.

Installed specialized peripherals into modified standard minicomputer operating systems (Data General RDOS, RTOS). Also developed the application software for these systems which printed bank checks in several foreign countries.

Developed the flight control software and instrumentation interface for a computer controlled drone aircraft (RPV). Developed the airborne data link software for the F14 fire control system. Also installed major updates to the airborne executive and graphics display portions of the F14 system. Developed control and display software for the training simulator version of the F14 fire control system.

Was software project head of the flight test data acquisition system for the DC10. System consisted of several SDS computers driving 5 Sanders graphics workstations from an airborne telemetry link in real-time. System was the pioneering commercial application of real-time telemetry for on-line analysis of a large scale system.

Was auto-test programming supervisor for inertial navigation systems. This Hughes VATE auto-test system was one of the earliest, large-scale, automatic test systems.

PROJECT ENGINEERING:

Conducted project reviews of tanker avionics system and military transport information management system. Responsible for the software engineering portion of a government-wide handbook supplying software engineering design guidelines and development practices for safety-critical systems.

Co-authored paper and delivered tutorial on simulation of failure modes and safety-critical software development at IEEE WESCON-96 -97. Teaching engineering graduate course, "Engineering the Software Product" for Loyola Marymount and UCLA CS departments. Presented several short courses "Introduction to Software Architecture", "Introduction to Safety-Critical Software Development" & "Competitive SW Engineering" for USC, "Ada Project Management" for George

Washington University (GWU), and "Software Process Management", "SW Engineering Overview for Developers", and "Requirements Management" for the Software Engineering Forum at California State University - San Diego.

As an expert witness, supported analysis and testified concerning technology issues and evidence for numerous litigations. Authored invited article "Software Engineering & Litigation" and gave talks on the subject at UCLA and professional meetings.

Developed the systems requirements specifications for the Runway Visual Ranging (RVR) system for the FAA National Airspace System. Specialized in the Remote Maintenance Monitoring System (RMMS) portion of the RVR which provided a fully automatic and remotely accessible maintenance functionality. RMMS is characterized by a multi-level, variable path, secure, nationwide, dedicated communication network.

Co-inventor on three patents for different generations of systems which use residential telephone service to read utility meters from central monitoring locations. System accesses the utility interface with the local telephone in either the on-hook (high impedance) or off-hook (via a trunk or maintenance port) state.

Developed the communication and control architecture for a dynamically reconfigurable, multi-processor, Ada based, simulation of a command and control system. Designed and supported installation of the computing and communication facilities for a civil engineering service bureau.

Designed in-flight processing on a satellite monitoring maritime weather (SEASAT). Designed early architecture for deep space tracking and data acquisition network (DSN).

EDUCATION

UCLA - Master of Engineering, Engineering Executive Program

Loyola University, Los Angeles BS EE

MISCELLANEOUS

Currently active SECRET clearance (held by own company facility clearance), held special access EBI

Registered professional electrical engineer (PE), State of California and holder of ICCP Certificate in Data Processing (CDP/CCP), listed as expert witness in Los Angeles County Bar Association directory

Co-holder of three patents on two generations of systems to read utility meters (water, gas, electric) over standard telephones

Senior Member of Institute of Electrical and Electronic Engineers (IEEE), Member of National Society of Professional Engineers (NSPE), Independent Computer Consultants Association (past Los Angeles chapter VP) and ACM SIGSOFT and SIGAda

Member of Steering Committee of USC-sponsored Software Process Improvement Network (SPIN); member of UCLA Engineering Alumni executive committee; Lecturer at Loyola Marymount and UCLA Computer Science departments, teaching graduate course in software engineering. FAA Candidate Designated Engineering Representative (inactive) Avionics Software (DER) and ISO 9000/TickIT trained in software quality auditing.

Have authored and delivered many short courses, papers, magazine articles and talks on software engineering, Ada and computer systems at universities (LMU, UCLA, USC, GWU, CSUSD), professional meetings and invited lectures at various business organizations

Masters track racer, US age-group National Champion (3K S/C) 1987,90,91,92

MACHINES and LANGUAGES

Sun / XWIN - Verdex Ada & C; SCO-UNIX, Intel, VAX & Sun host - x86, 68K, TI C40, PPC 603/750 (VxWorks) targets, Rational Apex development platform Ada 83 & 95; Alsys Ada - IBM VM, DOS & Windows NT host

Digital Equipment Corp. (DEC) - VAX, PDP 11/70, 11/45, Ada, Macro (assembly), FORTRAN

Data General - Eclipse, Nova, FORTRAN, Macro, ALGOL, Basic

IBM/compatible - PC's (Intel x86), DOS, Ms Windows, Sun/Solaris & SCO-Unix; 360, 370, 1130, BAL, FORTRAN, APL

Various micro and special purpose computers: TI DSP TMS320C40, MIPS 4700/4640, Motorola 680X0's & PPC 603/750 in VME configuration, 1750/1553 Bus, HP 21MX etc., Sigma series, CalComp, Lear Siegler and CDC airborne, Hughes Aircraft, Sanders graphics