

Skill-set (Subcategories Listed via Hierarchical indentation)

Software Architecture : Software Architecture using Object oriented Analysis/design + UML, Development process across full life cycle, UML, Design patterns, best practices enabling TRUE lean agility with OOA/D, SDLC.
Also experience Team/ technical lead and project management, advisors to CTO's, software engineering process management..
Advice on business strategy driven by in depth understanding of technology and once target market is understood.

C++ meta programming, (Latest standards C++14x//C++0x)

- **Environments.** Real-Time, Low Latency, Multi-threaded, Multi process. Distributed.
- Meta-programming, **Boost** (inc ublas/lapack, LinPack), **STL**, **Rougewave**, , creation of template assemblies
- **Microsoft Visual C++ (version 1.5 through to 2017 inclusive)**, Windows Mobile/CE .
 - Microsoft DDK (driver development kit), File Filters, IP Filters, driver install, services, firewall.
 - Win32-API, DLL, *RPC*, *MAPI*(Mail-API) , *ActiveX/COM+* ,OLE, MFC, explorer/desktop shell-extensions,
 - Direct Sound, Direct Show, Filters, Video, SDK, Direct X, Direct Sound, WIA,. WPF , MS Expression Design, 3D
- **QT** (multi-platform GUI-API by Troll-Tech)
- **Borland Builder & Enterprise** including VCL, RAD Studio.

DSP/Maths (C/C++ , fortran)

Monte Carlos simulation-Radiation models(Maxwells equations) of Wireless-network-simulation-spread spectrum, CDMA algorithms, DSP,(Signal processing), image processing, wavelets, Haar filters, FFT, convolution, S-filters, transfer functions, Special functions, PDE(partial differential equations, tensor equations), SVD, Boost(Libpack), CUDA, Mesh optimization, Tensors and matrix solvers, Matlab, Mathematica, Maple, Heat flow through solids, fluid dynamics. Creation of analytical equation used in network planning of mobile networks and creation of 'C' source for calculating signal loss/ path loss, other simulations.

- **Armadillo**, **Eigen** , **GSL**(Gnu Scientific library)+in house Wrappers, **openMP** (OMP),**CUDA**, in house libraries.
- Developed intuitive very fast linear-algebra library , tensor, svd, principle component analysis, other.

Data Science, Linear algebra, data reduction (reduce dimensionality), statistics and algorithms, Mathematica, Matlab.
Specialize in producing very fast analysis of large data sets. See above.

Database: (C/C++/C#) ODBC, ADO, (C++, C#.net), My-SQL, SQL-Lite, MS-SQL, Data mining (Telecoms). Aircraft Avionics configuration, Government patient records, payment systems, intranet reporting. Multimedia server, **OTL** (Oracle/ODBC Template Library) ,Developed SQL algorithms for Hybrid hierarchical tree structure 10¹⁰ nodes in standard SQL, mathematical modeling and analysis for tree optimization leading to scaling of efficiency for very large trees.

Coms/Telecoms/Wireless: (Embedded C, C++)

TCP/IP, UDP, MAC, IP, OpenSSL , Kernal-Firewall, 802.x, RF, wireless, CDMA chips n bits, modulation, spectral theory, remote sensors , ISDN, E1,E2,SS7,ISUP,C5, CTI, OSI-Model, ARINC, pipes, RPC, IPC, MAP, Nano-services, Codecs, VOIP, RS232/485, FAX, MELP, CELP SPI,I2C,CAN-bus, Blue tooth, modulation schemes, monitoring and data mining of network international data traffic, Modem, ASN1, ASN2, OpenSSL/TSL, X509, Certificate chain, Wireshark,

Graphics: (C/ C++, embedded 'C')

Open GL, ,GL-ES, GDI plus, win32 , FTLK, DirectX, Direct 3D , SDL (Linux and windows),
Implementation of 3D Rendering pipeline and rasterization /Virtual reality engines, Quaternion, texture mapping, Lighting models, Terrain rendering of large data sets, , sprite engines, Graphics hardware drivers, Developed windowing systems and controls ,e.g. many User interface components(embedded), Haptics, Graphics server for glass cockpit and glass cockpit editor for a major airlines(multi billions dollar). Voxel visualization-marching cubes, meshing, manifold operators, ARAP, TPS, Laplacian

Python: Numpty, norgate, twisted, graphics, Economic and equity fundamental extraction, WingIDE, Twisted, Zope, Wix, PGP + other libraries, web, scripting.

C#: Applications, Database- MS-SQL & MySQL, Gui, forms, XML parsers, Doc-view, Digital signature, XML, HTML, Intranet/internet Reporting via ASP(Active Server Pages) and C#, PDF Generation. TCP/IP, Comms.

JavaScript, HTML CSS. Presentation of financial data, views.

SCM(Source code management) : Bazaar, IBM Clear case(windows/Linux), Source Safe, StarTeam, Dimensions, SVN, Trax,

Standards: ISO 9001/9002 conformant, ETSI (*European Telecommunications Standards Institute*), ITU, ARINC 661, DO-178B-levelA (Safety critical), MISRA-C, Various other standards, X.509

Hardware Interfacing: Port analyzers, logic analyzers, Oscilloscopes, spectrum analyzers, tracing. IRQ's, Instrumentation, Altium(embedded FPGA Softcores /Xilinx web pac/IP), protocol analyzers, hardware/microelectronic schematics.

Tools : Presagis-VAPS-XT, Esteral Scade suite(training course), CUDA , Eclipse, Code blocks, Docomatic, VM-Ware, VirtualBox, Virtual PC, lint, Linux-Bash, VI, grep + Linux tools, make, nmake, NSIS.

Software packages: 3D Studio Max, (Word, visio, excel), windows, solaris, Linux, SCADA Intellution iFIX , **Mathematica, Matlab.**

Other Languages: Java from Sun SDK 1.0 to Eclipse, (Native Applets and Java virtual machine applets, multimedia, and forms,) Delphi(Testing of in house Com+ Macro objects), Pascal, Fortran-7 and Prolog, *Visual Basic* XML, Python

'C' and Embedded 'C/C++' (Firmware)

- Various compilers and target chipsets, ARM3, ARM7, ARM9, MSP430, Silicon Labs, Energy Micro , Texas Instruments, Motorola, Mathias, Atmel , IAR, embedded workbench, GCC-toolchain,(GDB etc) CC, Windriver, eclipse, code blocks, Misra-C, Debuggers, JTAG, schematics microcontrollers, Radio frequency, mesh networks. Native apps and TinyOS. RSA, FreeRTOS
- Lexical analyzers and parsers LEX, YACC, Buffalo, and RCTP Parsers
- RTOS Kernel implementation (memory manager, Multithreading kernel, timers, Mutex's, sync objects) thread safe MAC/UDP/TCP/IP stack on ARM. Control software for other applications, Touch screen displays.
- Comms: RF, CDMA, RLTS(real time location systems), RF tags, embedded Display panels, Audio, LCD color.
- Linux, FreeRTOS and windows CE/mobile plus platform builder and BSP's, ALSA, UDP/TCP Mutithreading.
- Inhouse RTOS Implementation of "Memory manager Kernel", "Preemptive Multithreading OS kernel: timers, threads, Sync , Comms Kernel: Multi-threaded comms Kernel IP/UDP/TCP stack(link to application layer), mode switching,

Assembler : 086 Intel & AMD +SSE, MMX, MASM, TASM, Intel VC , SIMD graphic engines and DSP, 68000, 6800, Atmel, MSP430, assembler, IAR, PICs s and TI(*Texus instruments*) , **ARM7, ARM9**, micro-controllers ASM, RTOS-kernel.