W. JOHN GUINEAU

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SUMMARY:

Self employed, principal-level software consultant. Individual contributor and system architect. Founder of Coyote Technology Inc., an independent software consulting company since 2002. Clients include NASA Jet Propulsion Laboratory, MIT Lincoln Laboratory, AMGEN and US Army Corps of Engineers, CRREL. Successfully and seamlessly work on multiple simultaneous projects covering a wide variety of hardware/software environments.

Over 28 years of experience spanning low-level device drivers and embedded software/hardware systems, to full multi-user & GUI, distributed applications and operating system internals. Software and hardware design capabilities. Recognized as providing unique insight into problem solving, analysis and integration issues. Demonstrated excellent written, verbal and presentation skills. Work well independently or in team environment. Demonstrated excellent mentoring and team leadership abilities. Presenter at project design reviews (PDR, CDR).

Inventor, US patent #*5,426,736*. Recipient of *many* individual and group awards throughout entire career. System architecture and design brought JPL's Jason-1 satellite ground system team to NASA Software of the Year competition, at which I was also a presenter.

DoD Secret Security Clearance.

Operating Systems: Windows Vista/XP/2000/NT/98/95, Windows CE (PocketPC,) UNIX/Linux, Android, SGI Irix, Sun Solaris, OpenVMS VAX/Alpha, VxWorks, several other misc. and embedded devices.

Languages: C, C++,C#, Java, Python, Perl, Tcl/Tk, FORTRAN, PASCAL, Unix shell scripting, VMS DCL procedures, VAX MACRO, Atmel AVR, 80x86, Z80, 65xx, 68000, PowerPC, other misc. embedded and assembly languages.

Major Technologies: .Net, Windows Forms, Xilinx FPGA, ISE, EDK, Oracle, Apex, Android, device drivers, JTAG, MFC, JFC, COM, WIN32 API, Swing, TCP/IP, JNI (Java Native Interface), Java2D/3D, CORBA, RMI, JINI, LDAP, Qt, X Windows, ODBC, JDBC, MySQL, SQL Server, HTML, Client-Server, Systems Analysis, Object Oriented design, multithreaded C/C++/Java design on Windows and Unix systems, Command and Control, Distributed Systems, Microsoft Access, Microsoft Visual Studio, Microsoft eMbedded Visual Studio, Microsoft Visual SourceSafe, Microsoft FrontPage, Borland JBuilder, Symantec VisualCafe, PVCS, CVS

EXPERIENCE:

2008-Present: **MIT Lincoln Laboratory:** Lexington, MA
Independent Software Consultant through Digital Prospectors Corp.

Lead flight software developer for Lunar LaserCom Demonstration (LLCD), gigabit laser-based communication between Earth and the Moon. NASA Ames/GSFC "LADEE" satellite, planned to orbit the moon in 2013.

Responsible for flight software design, development and implementation on BAE RAD750 spaceflight processor avionics platform. Embedded PowerPC development in C, analysis using MATLAB and other custom applications. VxWorks 6.7 and WindRiver Workbench 3.1, Visual Studio 2010. GSFC ITOS ground station. Also established engineering/flight testbed and system test & development infrastructure.

Embedded FPGA development using Xilinx tools and embedded PowerPC processors to prototype spacecraft instrument and instrument peripheral simulator.

Extensive flight software and vxWorks performance analysis for hard-real time 5KHz pointing and tracking controller developed in MATLAB Simulink/RTW, Embedded Coder. Automatic flight code generation via custom C#/.Net including XML databases for command and telemetry.

Use of AGI Satellite Toolkit (STK) and NAIF (JPL) SPICE toolkit for computing, analyzing and visualizing spacecraft orbit and Earth ground station geometry and pointing vectors.

2009-Present: **US Army Corps of Engineers, Cold Regions Research Engineering Lab** Hanover, NH
Independent Software Consultant

Working directly with scientists to develop an extensive web-based database application for the National Wetland Plant List (NWPL) update. This is a national effort involving several federal agencies (EPA, NRCS, FWS, USCOE, BONAP) to produce the next legal definition of the federal wetland plant list to be used by scientists across the country. Website provides in-depth access to all botanical data on over 30000 species of plants and photos with extensive query capability. Site provides the ability for obtaining government and public/private input through several rounds of voting and post-processing analysis. Consists of an extensive Oracle 11g database with Oracle Application Express (Apex 4.x) web interface.

2002-2009: **AMGEN:** Thousand Oaks, CA
Independent Software Consultant

Projects include a proprietary disease pathway analysis tools, written in C# using Microsoft .Net Windows Forms framework including a custom C# interface to Matlab compiled "M" files. Tools are used to analyze and visualize experimental results leading to the discovery of drug actions and interactions with small and large molecular agents.

Implemented a suite of data analysis and visualization tools based on a comprehensive framework developed by Coyote Technology. The tool set has expanded into many of Amgen's key research laboratories and is being expanded almost daily. Areas include electrophysiology, immunology, hematology, proteomics, X-Ray Diffraction, Mass Spectrometry. Microsoft SQL Server, Windows Forms.

Other projects include reverse engineer and rewrite of Amgen's proteomics platform for analyzing mass spectrometer data (LCQ/QTOF). This tool is used to discover the molecular structure and configuration of proteins, amino acids and other large molecule contributors to cellular function and interactive mechanisms for disease and pharmaceutical research.

2007-2008: **Textron Defense Systems:** Wilmington, MA
Software Engineering Consultant

Advanced Solutions Center. Technical Project Lead on numerous government and military contracts, including various sensor systems, satellite communications, hand-held deployment systems and acoustic classification and bearing determination. Developed and demonstrated MPEG-4 (H.264) Video over low-bandwidth military SDR radio connections. Worked with FCS UGS (unattended ground sensors), lead on project to investigate early fielding of FCS UGS to current forces. Implemented Direct3D visualization of acoustic tracking systems.

1998-2007: **NASA JET PROPULSION LABORATORY (JPL):** PASADENA, CA
Independent Software Consultant

1. *MSAP MULTIMISSION SYSTEM AVIONICS PLATFORM.*
   - MEMBER OF FLIGHT SOFTWARE TEAM.
   - DEVELOPED DEVICE DRIVERS AND CORE SYSTEM SOFTWARE FOR JPL'S NEXT GENERATION SPACECRAFT AVIONICS PLATFORM UNDER VXWORKS.
   - BASELINE FLIGHT SOFTWARE FOR MSL ROVER (MARS SCIENCE LAB – LAUNCH 2011).
   - RESPONSIBLE FOR MILSTD 1553B BUS CONTROLLER (BC), REMOTE TERMINAL (RT) AND BUS MANAGER COMPONENTS OF CORE SPACECRAFT COMMUNICATIONS BUS.
   - INTERFACE WITH IN-HOUSE PROTOTYPE HARDWARE, INCLUDING FPGA HARDWARE DEBUG
   - CPCI AND BAE RAD750 SPACEFLIGHT COMPUTER (SFC), MTIF, MSIA.
2. *FIDO RESEARCH ROVER AVIONICS*
   - DEVELOPED CUSTOM LINUX KERNEL DISTRIBUTION FOR REAL-TIME ROBOTICS CONTROL. DEMONSTRATED RESEARCH MARS ROVER ("FIDO") RUNNING FULLY UNDER LINUX.
   - SPECIFY AND UPGRADE ROVER AVIONICS TO HIGH-SPEED MOBILE PENTIUM-M EMBEDDED PLATFORM. BRING UP VXWORKS AND CLARATY ONBOARD SOFTWARE, INCLUDING IEE1394 HIGH SPEED SYNCHRONIZED CAMERAS.
   - MANY OTHER TASKS.
3. *SOFTWARE ARCHITECT FOR JPL'S "TEAM-X" ADVANCED SPACECRAFT & MISSION DESIGN FACILITY*
   - REDESIGNING AND MODERNIZING THE DATA INFRASTRUCTURE TO PROVIDE NASA-WIDE DISTRIBUTED COLLABORATION, REAL-TIME MONITORING CAPABILITY AND POST-ANALYSIS

of spacecraft design studies.
- Upgrade and Maintain ICEMaker distributed design system.

4. *DARTS/DSHELL, ROAMS Mars Rover Simulator*
   - System architect for SimScape, a comprehensive framework for surface terrain modeling, visualization and simulation, rover mobility studies.
   - Terrain modeling and simulation, reconstruction of "Mars yard" from laser scanner data, developed tools for collection of data and analysis, visualization and processing.
   - Onboard VxWorks/CLARAty FIDO Rover data collection for ROAMS Validation
   - Designed and Implemented numerous architectural and infrastructure improvements & advancements to rover simulation framework.
   - Implemented cohesive C++ based API "RoamsIF" to encapsulate Roams functionality into a simplified, yet powerful programming interface for configuring and running rover simulations.
   - Implemented parameterized model for defining current and future Mars Rover vehicles
   - Performance analysis and tuning to optimize system resource usage.
   - Architectural and system resource for group
   - Many other tasks.
5. *Avionics System Architecture Tool*
   - Hardware simulator for spacecraft avionics components (CPU, busses, instruments) JPL budgeted 2.5 man-years, not sure if project was feasible. I completed and demoed it in under 2 months.
   - Reverse-engineered and re-implemented StateMate simulation engine from Unix to Windows and wrapped auto-generated C-language model code into C++ standalone application.
6. *JASON-1 Satellite project*
   - Software architect for ground command and control system - JTCCS.
   - Designed and implemented "common software services" (CSS) written in Visual C++
     i. Cross-platform design provides abstraction of hardware and OS
     ii. Implemented on both OpenVMS Alpha and Windows NT/2000/XP.
     iii. Enabled rapid (<2wks) switch from VMS to Windows NT
     iv. mplemented a cross-platform Java Native Interface (JNI)
     v. Cognizant Engineer (COG-E) for JTCCS User Interface, written in Java
     vi. Additional major responsibility assigned at critical juncture
     vii. TCP/IP client/server architecture allows many users of JTCCS
     viii. UI client runs unmodified on Windows, Unix/Linux and MAC OS X.
     ix. Integrated TCL engine into the server to provide JPL's first–ever "lights-out" automation capability of a spacecraft.
   - Designed and implemented a hand-held client in Java for Windows CE, which enabled flying the Jason-1 spacecraft from a Compaq iPAQ – another first for JPL. This was briefed in a special session to Dr Charles Elachi, Director of JPL, as well as to several other groups within JPL. Videotape of presentations sent to USAF, and Voyager spacecraft team. Design presented at numerous events including GSAW.
   - Designed and implemented the Event Manager process, which coordinates all other system processes and monitors system activity, providing system startup, shutdown and failsafe operations, all in a platform-independent manner.
   - Utilized various code analysis tools (BoundsChecker, Jprobe) to monitor and tune runtime C++ and Java code.
   - ***Received "Meritorious Service Award" from JPL.***
   - ***Received "Special Thanks and Recognition" (STAR) award from JPL.***
   - ***Received "Software Excellence" team award from JPL***
   - ***Received 2 separate "Certificate of Recognition" awards from NASA***
   - ***Presenter – team received Honorable Mention in NASA Software of the Year.***
7. *Shared Net project*
   - provide a reliable, distributed network infrastructure for military combat use. Customers include US Marines and other Government agencies.
   - Multithreaded C++ and Java in a Solaris Unix environment
   - Provided a detailed, broad analysis of CORBA ORBs , including performance.

- Provided general architectural & design guidance to the team
- Developed a multicast based utility, "ServerBeacon" written in Java, which facilitated network connectivity between servers and clients in ad-hoc network environments.

8. *Frameworks project*
   - Computer science research project for DISA (Defense Information Systems Agency). Goals were to devise platform and technology independent distributed computing infrastructure.
   - Two-person team directly funded to provide insights into modern distributed computing capabilities for future system development within DISA and related agencies.
   - Designed and implemented Java-based technology independent lookup and discovery, request/response, publish & subscribe, and distributed events.
   - The design encapsulates Jini, CORBA, RMI and pure TCP/IP.
   - Applications can create entire clients and servers based on CORBA, RMI or pure TCP/IP sockets with a single line of code.
   - Devised XML based RPC mechanism prior to the introduction of similar technologies such as SOAP used in Web Services.

1996-1998 **White Pine Software** Nashua, NH

Senior Software Engineer

- Design engineer for video in CU-SeeMe Internet Video Conferencing product.
- Provided product integration of commercial cameras and capture devices & drivers.
- Utilized NuMega SoftICE to analyze crashes in beta drivers & hardware.
- Used NuMega BoundsChecker to discover bottlenecks, memory leaks
- Completely redesigned the Video subsystem using Microsoft ActiveMovie (aka DirectX) written in C++, using MFC.
- Recognized by Microsoft for significant contributions to ActiveMovie 1.0 beta.
- Extended ActiveMovie 1.0 to include video capture/compression (not available until AM 2.0) including unique application interface ActiveMovie "filters" written in C++.
- Invited to "invitation-only" preview of AM 2.0 (DirectX Media 5.1) at Microsoft
- Made several architectural improvements to CU-SeeMe, including multi-threading, TCP/IP network packetization & de-packetization which reduced latency and packet loss, greatly improving audio/video quality over slow/congested networks.

1995-1996 **Avid Technology** Tewksbury, MA

Senior Software Engineer

- develop a proprietary next-generation Windows 95/NT Object Oriented Multimedia Authoring application (MacroMedia Director competitor) written in C++ using MFC.
- Design/Implement complete GUI object properties system including full multilevel Undo/Redo architecture.

1994-1995 **Virtech Inc.** Nashua, NH

Systems Software Engineer

- Design, develop and test industrial Process Control applications on Windows 3.1/95/NT and VMS, DECWindows (X Windows) platforms.
- Real-time control applications written in C, Visual C++, MFC. Required detailed knowledge of MFC and system internals for performance optimization.
- Direct hardware interfacing, PID control, numerical and graphical data analysis.
- Developed interactive data plotting and on-screen data analysis.
- Products ranged from control/analysis of ASTM strength of materials testers to industrial heat/pressure treatment furnaces ("HIP" furnace) and automotive engine parts analysis.
- Direct & on-site interface for customer requirements and application prototype & design, as well as product support and system trouble shooting.

1991-1994 **Digital Equipment Corporation** Nashua, NH

Principal Software Engineer- VMS Development group

- Received U.S. Patent #5,426,736 for VMS I/O subsystem software performance tuning algorithm. Algorithm provided a 300% performance improvement for SCSI RAID

- Patent included accurate mathematical modeling and analysis of I/O subsystems.
- Designed and implemented industries first device drivers for SCSI-2 tagged command queuing on VAX port/class architecture, written in VAX MACRO.
- VAX/VMS System-level debugging using the XDelta system debugger.
- Extensive use of Adaptec SCSI logic analyzer for debugging device driver code.
- Developed detailed graphical performance measurement and analysis tool that generated 3D surface plots of I/O performance characteristics, written in C.
- VAX SCSI Project leader in VMS Engineering, Guide future direction of SCSI in VMS.
- Seminar Speaker at several DECUS (DEC users group) Symposia throughout the United States.

1987-1991 **Digital Equipment Corporation** Marlboro/Shrewsbury, MA
Sr. Software Engineer, Software Engineer II , Software Engineer I

- Promoted from tech to S.W. Engineer via Digital Engineering Review Board (ERB).
- ERB process was very selective and used for less than top 1% of DEC employees.
- ERB was a full day of verbal and hands-on, detailed questioning by 3 Principle Engineers, required unanimous vote for conversion from tech to engineer.
- Project leader/developer for SCAT (System Compatibility Automation Tool) and SDT (SCSI Detail Tester) written in C. SDT provides complete SCSI-2 level device conformance verification, and included a full custom scripting language.
- Voting member on DEC SCSI committee, nation-wide SCSI standards body.
- Researched and recommend group's SCSI testing strategy.
- Extensive use of Adaptec SCSI logic analyzer for debugging SCSI devices/software
- Architect, design and co-develop ITECS V2 test automation system and SDT, written in C on MicroVAX systems, using DECWindows (X Windows) GUI.
- ITECS (integrated test environment control system) was a revolutionary automation system, integrating IEEE-488 programmable power supplies, Large environmental test chambers (temperature, humidity) and several DEC MicroVAX systems across DECnet network.
- ITECS reduced 4-5 day disk device testing into less than 8 hours!
- Designed and implemented VAXMate based SCSI tape and CDROM diagnostics, written in 80x86 assembly. Installed at vendor site (HP in England) HP personally extended my visit in England after I found significant bugs in their SCSI DAT tape firmware.
- Taught three video taped seminars: ITECS, Introduction to SCSI, Using SCSI.

1984-1987 **Digital Equipment Corporation** Shrewsbury, MA
Electronics Technician II, III, IV

- Designed and developed VMDD (VAX/VMS MSCP Disk Diagnostic), in VAX MACRO.
- Designed and developed ITECS V1 test automation software, written in Assembly and C on PDP-11 and DEC Pro 350 computers. – ITECS is still in use today, largely unchanged!
- Major industry Disk vendors (e.g. Maxtor) offered to buy the ITECS system from DEC.
- Evaluated 3rd party QBUS/SCSI adapters for SCSI and MSCP compliance.
- Evaluated industries first SCSI hard disk prototypes.

1979-1984 **Other related work**

- Electronics Technician. Calibration, troubleshooting and repair of Scientific Data Acquisition Systems. – Bascom-Turner Instruments, EIC Laboratories Norwood, MA.
- Repair of television and stereo equipment and all household appliances (from toasters to microwaves) – Allied Appliance, Marlboro, MA

Significant Personal Projects

- Have built many electronic projects since age 7, including a Timex-Sinclair ZX81 computer, self taught BASIC and Z80 assembly language.
- Printed Circuit Board (PCB) layout, design and fabrication experience.
- Developed an automotive diagnostic (OBD-II) interface for custom hardware written in C++/MFC for Windows CE on Compaq iPaq handheld
- Designed and developed a wireless, GPS based tracking device, including professional double-sided custom PCB. Uses OEM GPS and 2-way paging modules, with an AVR micro controller and custom firmware written in C. Device has ability to add

ADDITIONAL SENSORS, SUCH AS MEDICAL MONITORING AND ACCELEROMETER/FALL DETECTION.

- DESIGNED AND BUILT A 2-AXIS ACCELEROMETER DEVICE FOR SEISMIC MONITORING.
- WROTE SYSTEM SOFTWARE EXPANSION ON CARTRIDGE ROM FOR COMMODORE VIC-20 AND C64
- MICROSOFT BETA TESTER OF WINDOWS 98, WINDOWS NT4.0, 2000 AND XP
- BETA TESTER FOR X-10 CORP (HOME AUTOMATION), BOTH HARDWARE AND SOFTWARE PRODUCTS.

EDUCATION:

1991-2010 **Daniel Webster College** Nashua, NH
BSSD. (BS, Software Development)
Magna Cum Laude.

1987-1991 **WORCESTER POLYTECHNIC INSTITUTE** WORCESTER, MA
Continued work towards BSCS/Physics.
Admitted as special case "part time" day student QPA: 3.75/4.0

1983-1987 **NORTHEASTERN UNIVERSITY** BOSTON, MA
Earned Associates Degree in Electrical Engineering (ASEE) QPA: 3.8/4.0

1982-1983 **GTE Sylvania Technical School** Waltham, MA
Honor Graduate of 800hr Computer Electronics Curriculum.
MAINTAINED A GRADE POINT AVERAGE OF (THEORY) 98%, (LABORATORY) 100%.
GRADUATED TOP OF CLASS, RECEIVED SPECIAL LETTER OF RECOMMENDATION (AVAILABLE UPON REQUEST.)

1982 **US NAVY** MARLBORO, MA
Applied for "Nuclear Power" program during (then-required) draft registration.
Took ASVAB (Armed Services Vocational Aptitude) test in Boston, MA.
REQUIRED 14/98 POINTS TO PASS, I SCORED 93. THE NAVY INDICATED IT WAS THE 2ND HIGHEST SCORE EVER ACHIEVED. I COMPLETED THE ALL-DAY TEST IN ABOUT 3/4 OF THE TIME ALLOTTED.
TOOK SPECIAL PHYSICS APTITUDE TEST. REQUIRED 35/47 POINTS TO PASS. I SCORED 43. AGAIN, NAVY INDICATED IT WAS ONE OF THE HIGHEST SCORES EVER SEEN ON THAT TEST.

DEC Internal Training

VAXWORKS SYSTEMS SEMINAR	VAX BLISS-32 PROGRAMMING	NEURAL NETWORKS
VAX/VMS INTERNALS & DATA STRUCTURES OF UNIX	VAX-11 C PROGRAMMING	COMPREHENSIVE OVERVIEW
VAX/VMS TECHNICAL OVERVIEW	MANAGING YOUR MICROVAX	DESIGN AND MANUFACTURE AT 6 SIGMA
INTERNALS OF A VAX/VMS PROCESS MANAGEMENT	STRUCTURED SOFTWARE TESTING	SOFTWARE PROJECT
PROBLEM ANALYSIS/DECISION MAKING	TIME MANAGEMENT	RON LAFLEUR PROJECT MANAGEMENT
TECH. OVERVIEW OF WINDOWS NT	WIN32 PROGRAMMING	NEW AGE THINKING