**Gregory Carl White**

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**Summary of Work Experience:**

 Fifteen years consulting as a Systems Software Engineer and Architect for embedded systems. Extensive experience in embedded design and programming as well as system level requirements.

BSP specialist. Extensive recent experience in designing, developing and testing packages for RISC-V And ARM using VxWorks and Yocto. UEFI Secure Boot loader development using U-Boot and Yocto. Recent expertise designing and developing secure Root of Trust components. Recent experience designing and developing TPM modules.

 Embedded Systems Engineer and Programmer with extensive experience designing and developing FPGA hardware, device drivers and application software. Expertise in using VHDL, Verilog, VxWorks and Board Support Packages. Video streaming and image processing expert. Embedded programming using C and C++ 17 for both 32 and 64 bit.

Embedded video streaming programming. Display resolution, refresh rate, screen rotation and GPU algorithm programming. H.264 encode/decode, MPEG-4 and FFmpeg. RFC 3550 and 6184 protocols as well as RTP/IP. FPGA Simulation using both the Intel Quartus Prime Design Suite and Questa.

Embedded Python programming using Python3, PyQT5 and Flask.

Space Fibre, Ground station to Satellite communications, Secure Gateway Routing, and Telemetry protocol specialist.

 Embedded Automotive protocol specialist(CAN, J1939, J1534).Voice over IP traffic flows that meet or exceed government standards for an SDR (software defined radio). TCP tunnel encryption using AES and the PyCrypto library.

 MATLAB development and SIL testing using MATLAB Coder.

 Network programming at Layer-3 and Layer-4 for TCP, IP, IPSEC and User Mode Linux. HAIPE protocol driver design and maintenance. Linux kernel device driver expert.

Very experienced with Aerospace requirements management and MBSE tools such as DOORS and Cameo Enterprise Architect. Experienced in system level modeling using DO178. Skilled in the use of SDLC, UML, SysML, UPDM, BPMN and SoaML.

 **Education:**
Bachelor of Applied Science, Florida Atlantic University, Boca Raton, Florida     Software Engineering 1978
University of California, Berkeley, California - Professionals Extension Program - Computer Science 2011

**Employment History**

**Under contract to: Northrop Grumman, Chandler, Arizona**

**April 2021 – May 2024**

**Embedded Software Engineer -** Embedded Linux programming for the design and development of a RISC-V based Board Support Package for a military grade missile weapons system that implemented the Space Agency requirements for NGI(Next Generation Interceptor). Extensive use of VxWorks 7 using Tornado and Workbench as well as C++ 17 for device driver design, development and implementation. Extensive use of the RISC-V Polarfire SoC using the Motorola MCFxxxx chipsets.

Embedded video programming using the NVIDIA Video Codec SDK with NVENC/NVDEC, I2C, CAN, Space Fiber, UART and SPI device driver and kernel level programming. Additional experience in designing Layer-2 Network device driver interfaces. Extensive Linux scripting using PERL, Bash, C shell and TCL in a Red Hat Linux 6.10 and 7.9 environment. NVIDIA

 FPGA design and development using VHDL, Verilog, Vivado, LabView and Libero. Expert in the design of complex systems using synthesis and simulation. Expert in the application and implementation of CLB’s(LUT, Flip-Flops, RTL) as well as specific implementations for: AV1, H.264, RTP/IP, Space Wire, Space Fibre, Video, CAN, J1939 and J1934. Extensive use of the CAST H264RTP IP Core for encapsulation.

 Extensive C++17 and C programming as well as RISC V assembly language. Boot Loader programming and debugging using Das U Boot. Expert in the use of gdb and Lauterbach TRACE32 JTAG.

 Extensive use of Cameo Enterprise Architect 2021. Requirements analysis, definition and documentation using SDLC, UML, SysML, UPDM DoDAF 2.0, DO 178, MoDAF and NAF 3. Well experienced creating Context, Class, Sequence and other diagrams as well as interfacing to DOORS.

 Code development, assistance and generation using Chat GZapper, Code Runner, Zapier, IBM Watson Code assistant and Amazon Code Whisperer.

 Agile Scrum environment using Atlasssian JIRA. Extensive use of GitHub and GitFlow in a continuous integration environment using Jenkins. Pipeline building as well as Software Factory.

**Under contract to: Antenna Associates, Inc Brocton, Massachusetts**

**March 2020 – April 2021**

**Linux Embedded Software Engineer** Embedded Linux programming for system and user level applications to support a proprietary antenna system. Military grade programming. C/C++ programming for the design and development of a Board Support Package for the Versalogic OWL EPU-4012 controller. MATLAB programming for complex antenna rotations and positioning as well as SIL and PIL testing using MATLAB Coder.

 Extensive use of: Linux kernel drivers, low-level socket programming. System daemon programming. RS-232 serial port communications programming. Network level programming. Linux debugging using gdb. ncurses display programming. Extensive use of: bash and Python scripting, Make files, ARM 9 assembler(THUMB) and Debian Linux 11.4

 Embedded video streaming programming for the design of real time data capture and playback using the TI DaVinci DM148 digital media processor. Extensive use of the GStreamer TI plugin, Codec engine processing and interfacing to the DVSDK provided by Texas Instruments. Image rotation, Video scaling, H.264 encode/decode, FFmpeg, FFplay, FFprobe, Python, TCL and Perl scripting. RTP/IP, RFC 3550 and RFC 6184 protocols. Very familiar with using Vivado and Questa.

 Video display driver programming and enhancements for a custom text based I2C display panel using C++ and the ncurses library.

 C, C++ and C# programming using Microsoft Visual Studio for the design and development of an API to allow Desktop and Mobile applications to program, configure and control the IFF Antenna. Extensive use of the .NET 6.0 class library for device interfacing as well as Windows Forms.

 Extensive use of the Python PyCrypto library for AES-256 data encryption using both Stream and Block mode designed to work with a customized TUN/TAP driver to secure message transfer.

**Under contract to: Honeywell Corporation, Phoenix Arizona**

 **January 2019 - March 2020**

*Full Stack Web Developer* Lead architect and designer for the next generation of

corporate/enterprise level cyber security software(Honeywell Risk Manager). Extensive use Microsoft .NET API’s. including WMI. Visual Studio .NET application programming using C# and the Entity Framework in conjunction the extensive use of the Java J2EE API development coupled with GraphQL and Apollo. REST API design and development. IntelliJ JAVA development. React JS version 16 front end development using MobX coupled with the use of advanced UI features such as MonoRepo, Shadow DOM, Virtual DOM, Composition and Inheritance component design. Python 3 script programming that focused on building and designing valid WMI SDK requests. HTML 5 programming with an emphasis on document preparation as well as audio and video enhancing.

**Under contract to: Local Motors, Tempe, Arizona**

**January 2018 – January 2019**

**Linux Embedded Software Engineer** Embedded Python Linux programming for system and user level applications that featured multiple automotive CAN BUS controllers sending and receiving real-time data from an autonomous vehicle. Linux device driver and BSP programming for a customized SOC. Extensive use of virtual devices, gateways, message brokers(MQTT, Mosquito), roles, policies, root certificate authentication, Python3, C, C++ and C#. C++ programming using C11 coupled with Visual Studio 2019 v16.8. CAN Bus tools, Amazon Web Services(IoT, Lambda, DynamoDB, S3, EC2. Real-time event driver programming using threads, interrupt driven tasks, call backs and event notifications. MATLAB simulation programming for real-time precision steering and braking.

**Under contract to: Boeing Defense Systems, Huntington Beach, California**

**January 2013 – December 2017**

**Embedded Software Engineer** System architect responsible for the design and development of system level requirements for a Software Designed Radio. Extensive use of JTRS and DOORS for the developing of SRS requirements.

 VxWorks Embedded Linux systems engineer responsible for the design and implementation of a Reliable Unicast Transport stack (Layer 3) that anchor and support command level battlefield network communications in a Mobile Ad Hoc Network (MANET) environment associated with FCS project. Linux network kernel programming to stabilize and sustain Voice over IP traffic flows that meet or exceed government standards for situation awareness. Software Defined Radio (SDR). JTRS WIN-T and GMR radio waveform integration. HAIPE (IPSEC). Routing protocol design and implementation. Linux kernel debugging and testing. C and C++ programming. Linux based scripting using Python and bash. Extensive JavaScript and Node JS single-event loop programming for a customized event notification interface. GNU Tools (MAKE). Linux network kernel configuration and debugging using layer 4-protocol interfacing. ARM, XSCALE and Freestone microprocessor implementations. Virtual devices. TUN/TAP and network stack interfacing (frame reception, net device, and soft net data). GNU Toolchain (gcc, gdb, binutils, uClibc, BusyBox). Boot loader(U-Boot) programming using the Eclipse IDE. Linux kernel debugging using GDB, OOPS, Ksymoops, YAMD, Memwatch and Electric Fence. Linux embedded Kernel development using JTAG and USB based kernel development tools such as Abatron and Lauterbach.

**Under contract to: Boeing Integrated Defense Systems, Anaheim, California**
**January 2012 – December 2012**

**Linux Embedded Software Engineer** VxWorks embedded Linux systems engineer responsible for Linux kernel tuning and testing in order to stabilize and sustain Voice over IP traffic flows that meet or exceed government standards for an SDR (software defined radio) associated with JTRS project. Extensive use of Green Hills INTEGRITY 4.1.8, MULTI 4.2.3 and rtserv. User Mode Linux(UML). HAIPE protocol driver design and maintenance. Linux kernel debugging . C and C++ programming using CORBA and ACE pattern design. Linux network kernel configuration and debugging using layer 4 protocol interfacing. Virtual devices, TUN/TAP, network stack interfacing(frame reception, net\_device and softnet\_data structures, the netif\_xx call interface, softirq’s and polling), NAPI, traffic control and rate limiting. Linux kernel 2.4 and 2.6 enhancements. Linux GNU, Make, ssh and telenet.

**Under contract to: Snapon Diagnostics, San Jose, California**
**January 2011 – December 2011**

**Embedded Software Engineer** VxWorks device driver design, development and implementation for a Freescale based automotive diagnostic testing tool. Extensive use of WorkBench. Automotive protocol message implementation using ISO specifications(ISO 9141, CAN, J1939, J2534, ISO 15765). USB and VCI task and interrupt design and implementation. Task prioritization and switching, timer and memory management and interrupt latency. Linux GNU Tools. Python and bash scripting. GCC configuration. C, C++ programming. Eclipse 3.7 framework.

**Under contract to: Intel Corporation, Hillsboro Oregon**
**January 2008 – January 2011**

**Linux Software Engineer** Linux 64-bit device driver programming for the next generation of super computer processing chips using MIC architecture. Lead device driver engineer responsible for the design and development of a suite of platform independent device driver and tools used to support Intel Xeon Phi architecture. Extensive use of Windows WDM and RHEL 6.2 Kernel API programming. Interrupt, DPC, and Multi-Threaded Kernel Programming. Timer, and Work Queue management. Visual Studio 2012. KlockWorks static code analysis and metrics. Windows Dump file analysis. WinDBG extension development. C, C++ programming using Windows DDK.

**Under contract to**: **VisionMos, Tempe, Arizona**
**June 2007** **–December 2007**

**Embedded Software Engineer** Embedded image processing software engineer. ARM 9 programming and debugging using ADS v 1.2 and Metroworks Code Warrior. Image enhancement algorithm design using Bayer lens filtering. Preview video streaming mode processing. JTAG debugging using WinIDEA USB/JTAG debugger. ARM 9 assembler and C programming. .ELF and .BIN file design. ROM/RAM image relocation. Scatter file and boot loader design and enhancement. FPGA design and development using MatLab and Verilog

Under contract to: **I5Wireless,North Brook, Illinois**
**January 2007 – May 2007**

**Linux Device Driver Engineer** Linux device driver design and testing for a custom fiber optic wireless cellular communication device. Point-to-Point(PPP)protocol and sockets based device driver programming for a proprietary x86 Single Board Computer. Serial and TTY layer device driver programming and debugging using C and C++. Embedded kernel debugging using Lauterbach and Abatron JTAG ICE debugging hardware and software. tools GUI programming using C++, GTK and Mono. Red Hat Linux Kernel 2.4 programming. GCC and Makefile development. Unix scripting using Perl and bash.

Under contract to: **General Dynamics, Scottsdale, Arizona**
**April 2006 – September 2006**

**Embedded Software Engineer** Windows CE Systems design engineer tasked with the design and implementation of a custom OAL, BSP, Boot Loader and Voice over IP software associated with a proprietary XSCALE based secure PDA. Extensive use of Windows CE 5.0, XSCALE(Intel PXA270), Assembler, MainStone Developers Board, C, C++,AC595, AC870,GSM, CDMA, SSP protocol, HAPIS 3.0, Voice over IP and SMS.

Under contract to: **Triton Corporation, Long Beach,Mississippi**
**January 2006 – April 2006**

**Embedded Software Engineer** Linux embedded programming tasks related to hardware validation. ARM C and Assembler programming(ARM 920T, ELF, Thumb), Boot Loader design and testing; DiskOnChip(DOC) programming, Window CE BSP development, JTAG and ICE debugging. Linux(Red Hat, Fedora), Windows CE 5.0, Platform Builder, C, Embedded Visual C++ 4.2, EBOOT and NK.BIN development.

Under contract to: **Iridium Satellite,Tempe,Arizona**
**October, 2005 – December, 2005**

**Linux Network Software Engineer** Linux multi-threaded socket level application programming for an embedded RS-232 Fax device. 8051 C programming for an embedded socket client application that retrieved and stores incoming fax requests to a proprietary fax board, using a memory mapped store and forward design. Red Hat Enterprise 3 and 4, Linux Sockets, C programming, SSH, MySql, MAKE, GNU tools, Perl.