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| RON GROSS 49 Windsor Green Road  Greenland, NH 03840-2419  603-502-5802  ‘rongross@cherongroup.com’  (updated: 08 June 2025) | |
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| **SUMMARY:** | Over twenty years work experience in software/firmware design and development for embedded/open systems and applications development, including seven years of software engineering management. Focus is on IoT, embedded systems, communications, robotics, consumer electronics, and engineering management. |
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| **SOFTWARE:** | OS: VxWorks, Micrium uC/OS-II, Linux, uTasker, Keil MDK-ARM, QNX Neutrino, Spark OS, ThreadX, Embedded Linux, Zephyr, Arduino  Code: C, C++, C#, VB.NET, Perl, PHP,  Compilers: Microsoft Visual C++, GNU gcc/g++, Keil uVision, MicroChip MPLab, Atmel AVR Studio, WinAVR GCC, Wind River Tornado, Arm-Linux-g++, Avr-gcc, QNX, Eclipse/gcc/g++  Assemblers: Microsoft MASM, Motorola, BSO/Tasking, IAR, MicroChip MPLab, Keil  Tools: Araxis Merge, Sparx Enterprise Architect, PEAK CAN Explorers, Jira/Agile/Kanban, Arduino IDE, STM32Cube  Source Control: ClearTools/ClearCase/ClearQuest, CVS, Perforce, AccuRev, SVN, MKS Integrity, Git/Stash/Github, SourceTree  Web: PHP, MySQL, ASP, JavaScript, JQuery Mobile  Protocols: Modbus RTU/ASCII, Modbus/TCP, TCP/IP, UDP/IP, Fieldbus, SECS/GEM, BACnet, LonWorks/LonTalk, Profibus, CORBA, proprietary (slotted-aloha, peer-to-peer, master/slave, patents), HART, HART Device Description Language (DDL), CAN, Apple iAP1/iAP2, Zigbee. FTP, RESTFul, BLE |
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| **HARDWARE:** | CPUs: TI MSP430, Atmel Atmega/MegaAVR, Atmel ARM7/9/Cortex-\*, ST STM32, nRF52, nRF53, PIC32MZ  Emulators/ICE: Beacon, Nohau, Motorola, Microtek, Metaware, MicroChip RealIce, P&E Microsystems, TI JTAG, Atmel ISP, IAR J-Link (EWARM, EW MSP430), Keil, GDB, Eclipse, NetBurner, Spectrum XDS510/XDS560, iSystems iC5000, CodeWarrior, uLink PRO, ARM MultiIce, ST-Link  Analyzers: American Arium, HP, Tektronix, Acute Logic, CommView, Wireshark  Other Galil/Delta-Tau PMAC motion controllers, RadiSys VME, VME MicroSystems, AB/Modicon/Square-D/Schneider PLCs, Keithley-Metrabyte DAS boards, Z-World STD boards, OPTO-22, MCC iPort/AFM, Rockwell Flex I/O, TotalPhase Aardvark I2C, AccesIO DIO-32, Salae Logic Pro  Physical Layers: 232, 485, I2C, SPI, Ethernet, Power Line, microWire, Radio, FSK, HART, CAN, CAN/Fibre, Bluetooth/BLE, WiFi |
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| **EXPERIENCE:** | **The Cheron Group, Inc.**  President/Owner/Software Engineering Consultant  2024 to Present (following are contract positions under my corporation) |
|  | **Technical Interviewing**  **Ongoing**  Establishing interview procedures and processes for technical/engineering recruitment, for either permanent or contract positions. Learn what to ask, how to ask, when to ask, and what level of questions to ask dependent on the candidate or the position. |
|  | **Automotive Engineering**  **2024**  Developing C++/Zephyr based IoT device for g-meter measurements of racing vehicles. Running on nRF5340, connecting to the IoT world using Azure IoT and AWS IoT over wifi, Bluetooth, and cellular connections. Several options for field upgradeability. |
|  | **Medical Device**  **2024**  Upgraded Renesas RX65N-based C++ battery charger product to support new features, including new communications and battery management/measurement procedures. |
|  | **Semiconductor Inspection**  **2024-2025**  Developed bare metal firmware for new generation of inspection device, includes firmware for five separate PIC32MZ-based boards, including a CAN bus between them and ethernet for the main host board. Drivers for digital and analog I/O, stepper motors, serial buses. Upgraded previous generation of PC-based C# application to support new features. |
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|  | **SurfaceInk**  Firmware Architect  2017 – 2024 |
|  | Developed drivers, ftp client, and application layer code for IoT environmental sensor device, using Nordic nRF52832 (ARM Cortex-M4). System incorporates BLE, WiFi, pressure/temperature/volatile compounds/light/sound sensors and communicates to host/cloud system via multiple mechanisms (I2C and WiFi). Used nRF5 SDK for bare-bones OS. |
|  | Developed nRF52-based IoT personal air purifier that attached to a user’s nostrils. Measured breathing rates, particulates, temperatures, and pressures via onboard sensors and communicated with BLE host/central devices. |
|  | Developed BLE interface for a multi-sided gaming cube, including touch/movement sensor interfaces. Based on nRF52 processor. |
|  | Developed ear bud communications system using NFMI communications, controlled by an STM32 processor running FreeRTOS. Includes an audio codec and the NFMI driver chips. |
|  | Developed C++ app running on AtMega2560 using PlatformIO and avr-debug to control a 3D printer. Includes analog and digital I/O, some via SPI. |
|  | Developed C++ app running on Zephyr OS for nRF5340 device to control consumer electronics IoT medical device. Device uses BLE for OTA updates. |
|  | Developed C++ for embedded/busybox linux Cortex-Ax chip to control user and wifi interfaces. Developed C++ classes for WiFi, HTTPS, and MQTT control and access. |
|  | Developed C++ application for nRF52 device for consumer electronics to control MP3 music. Device uses BLE for OTA updates. |
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|  | **The Cheron Group, Inc.**  President/Owner/Software Engineering Consultant  1995 to 2017 (following are contract positions under my corporation) |
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|  | **Doble Engineering**  July 2017 – August 2017  Developed BSP and build scripts (using Yocto project) to get Ubuntu 16.04 running on a Xilinx Zynq UltraScale+ MPSoC (quad ARM Cortex-A53 and dual ARM Cortex-R5) development system for proof of concept. |
|  | **Abierto Networks**  May 2017 – July 2017  Developed Ubuntu Linux daemon and application to support kiosk system. Applications are developed in Qt/C++, using QT Creator. Interfaces to cloud system to update configurations and application files (web services). |
|  | **Ecovent**  April 2017 – May 2017  Developed Zigbee drivers, running on BusyBox linux, to interface to MMBNetworks module to provide Home Automation (HA) Profile for IoT thermostats. Firmware is c-based, developed using Eclipse and a gcc cross-compiler. |
|  | **TempControl Logic**  2015-2017  Developed distributed IoT temperature monitoring and control system for home thermostats. Temperature sensors (indoor and outdoor) are based on Spark IO Core modules (ARM Cortex M3 running Spark OS) which communicate via WiFi TCP/IP with a main controller based on a Raspberry PI 2 (Ubuntu Linux running on a Broadcom BCM2836 / quad ARM Cortex A7). Main controller includes a local Spark Cloud and C++ application that controls multiple thermostat zones and communicates to remote LCD touch screen user interfaces. User interfaces are based on Raspberry-PI 2 and a capacitive touch screen, running a C++ application and Qt. Spark IO Core is an InteretOfThings device (IoT) and the development environment is Spark Dev. Investigating usage of DecaWave DWM1000 devices (tags and anchors) to control temperature based on persons present - system uses ultra-wide band (UWM) for real time location services (RTLS) and communicates to Spark I/O and Raspberry PI devices using SPI. |
|  | **GridCo**  September 2016 – December 2016  Developed Linux (Ubuntu) drivers for communicating with and controlling photovoltaic and electric vehicle system using Modbus/TCP, Modbus over TCP and Modbus/RTU to monitor and control power availability and usage. Firmware is developed using gcc C++, multiple threads, and is fully object-oriented. |
|  | **Ivenix**  May 2016 – June 2016  Developed MSP430 (F5) boot loader for downloading new applications over serial interface of Class III medical device |
|  | **FitBit**  June 2015 – August 2016  Developed Class II medical device (with Class B software) using STM32F4 device (ARM Cortex M4) hardware. Firmware includes Bluetooth (low energy, BLE), wireless (WiFi server and client), analog measurement process, LCD display, over-the-air (OTA) firmware updates, data logging, and manufacturing processes and services. Product is ‘C’ based, using gcc and IAR, and interfaces to a Broadcom radio chip using the WICED SDK (Broadcom provided). Development includes full IEC 62304 process, including requirements analysis, architecture and design documents, unit tests (via CppUTest), TDD (test driven development), and integration testing. Used Jira/Agile development process. Product provides IoT/cloud-based access for user connection. |
|  | **PerkinElmer**  February 2015 – June 2015  Developed MSP430-based air-quality measurement equipment which collects data using multiple MSP430 devices and transmits the data to cloud storage via Wifi or cell modem. Rewrote low-level I2C drivers for multi-processor communications. Developed GPS and RTC data collection for positioning/time information. Added FatFs (fat files system using micro SD card) into TI-RTOS-based software. Code is C-code developed in TI's Code Composer Studio. |
|  | **TransMedics, Inc.**  March 2014 - February 2015  Developed C++ USB and Bluetooth (shell) drivers (dev/resource manager) for communicating with Apple devices using Apple iAP1/iAP2 protocol to i.MX6-based (dual ARM Cortex-A9) system running QNX Neutrino 6.5 (POSIX RTOS). Developed C++ drivers for serial-based blood oxygen saturation/hematocrit sensors (SaO2 and SvO2) and blood flow sensors. Made modifications to BSP to support new features. Development environment consisted of QNX Momentics IDE (Eclipse-based), IP-based development boards, gnu tools, and bash scripts. |
|  | **Recording Studio**  March 2014  Developed C++ test application running on PIC32 to control and collect data from a studio sound mixing board. Data is synchronized with SMPTE signals and transmitted to a PC/Mac application via USB. |
|  | **Curtis-Wright**  Oct 2013 - March 2014  Developed redundant CAN-based communications device to monitor switches and control display indicators. Protocol uses FEC (forward error correction) for additional protection. Code written in C/C++ using Keil uVision 5 and MDK-ARM RTOS. Runs on STMicrolectronics STM32F407 Cortex-M4 device. Developed CAN test suite using PEAK CAN Explorer system. |
|  | **Autoliv**  Jan 2012 - Oct 2013  Developed CAN-based communications specification and rewrote code for dual-processor vehicle radar system, which contains inter-processor communications and external device communications. Code written in C and uses TMS320 (C28x core, Code Composer 5 with XDS emulator) and Infineon XC23xx (C166 core, Tasking compiler with iSystems iC5000 emulator). Developed C#/.NET (Visual Studio 2010) GUI application to communicate with device to collect data and control operations using XML database. Rewrote TMS320 boot loader application and upgraded C#/.NET GUI application used for programming device. Developed .C#/NET DLL for generic access to features within device. |
|  | **Nuvera Fuel Cells**  Dec 2011  Developed a finite-state machine to control hydrogen fuel system. Incorporated Modbus/RTU and CAN interfaces to communicate to peripheral devices. Product is based on NetBurner MOD5234 (Freescale ColdFire 5234) boards, written in C and C++ and uses Eclipse development system with gcc tools. |
|  | **SecureCare**  Nov 2011  Helped debug CAN communications between multiple PIC 18 devices and ethernet TCP/IP-based communications for infant security systems and wandering resident solutions. Products developed using MPLab C and CCS c compilers for PIC18 devices. |
|  | **Hologic**  Oct 2009 - Dec 2011  Developed communications, diagnostics, logging and touch screen code for Class III medical device. System is based on Atmel AT91SAM (ARM9) processor, running Micrium uC/OS-II. Developed C++ code using IAR EWARM and OOA/OOD methods, including using Enterprise Architect UML development tool. Developed communications simulator using Visual Studio 2010 C++. Wrote System Requirement Specs (SRS) and System Design Documents (SDD). |
|  | **The Cheron Group, Inc** was engaged with the following companies and future details can be provided:  **Beacon Power, Iwaki, SepSensor, Ellacoya, Walchem, Bel Fuse, Inc., Axcelis, Texas Instruments, TimeLab Corp, AXTiming Systems, Masoneilan/Dresser, iRobot, TempControl Logic, Walchem, Nexus/Senea, MKS Instruments, MTL, Schneider Automations, BinTel Systems, EATON, dbi Corporation, IRIS Graphics, H&L Instruments, ASTeX, Borst Automation** |
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|  | **Transition Technology Inc./Measurement Technology Ltd.**  Manager, Systems Development  1988 to 1994  Developed real-time distributed industrial I/O product (8051 and 80x86 based) and a patented communications protocol. Responsible for software system level design of full product line. Developed custom interfaces to third party hardware/software including Allen-Bradley, Modicon, RadiSys, and VME Micro. Responsible for technical development and applications support with worldwide OEM customers, including IBM and Fischer & Porter. Responsible for porting 80x86 based system to 68020, using OEM customer-developed real-time UNIX. Responsible for meeting with customers for applications support and/or to develop new products based upon customer needs. Worked on developing next generation product using worldwide communications standards such as Fieldbus, ISP, LonTalk, and WorldFIP and large count multi-processor system using 80C188, 68HC11 and 68HC05 based hardware. Developed STD-based software interface to I/O product. Developed driver for interface to OPTO-22 products. |
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|  | **Ionex/HEI**  Senior Software Engineer  1987 to 1988  Developed real-time control software for robotic control system running on IBM PCs, using Galil motion controllers, for ion implanters. Developed a real-time communications system for use on a communications controller board (80186 based) for PC to PC and PC to DAS (Z80 based) hardware using fiber optic links. Met with current and future customers to provide applications/installation support and to incorporate customer requirements into product. Developed early prototype for maintenance and diagnostics on VME 68020/VRTX based sub-system. Upgraded current product to touch-screen user interface. |
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|  | **Caterpillar Inc.**  Test/Software Engineer  1984 to 1987  Developed data acquisition systems based on IBM PCs (using Keithly-Metrabyte boards) and HP80, HP200, & HP300 systems for in-house & customer tests. Developed prototype 68HC11 based system for next generation control systems, developing extensions for BSO/Tasking compiler on VAX. Designed new security and access control systems for facilities management. Added enhancements to 68000 & 6805 based engine/transmission control systems. |
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|  | **ALCOA Corp., REA Magnet Wire**  Control Systems Engineer  1983 to 1984  Developed plant process control systems, using Square-D and Allen-Bradley PLC's and embedded CPU boards, for the nation-wide REA wire plants. Added enhancements to current wire processing systems to triple throughputs. |
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| **TECHNICAL:** | U.S. Patent #5,021,777  Mode-Selectable Communications System |
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| **EDUCATION:** | Indiana Institute of Technology, Fort Wayne, IN  Bachelor of Science in Electrical Engineering |