Alexandru Cropacev

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Embedded Software Engineer/Architect/Lead

Professional Summary

* 20+ years of progressively diverse software experience in the high-tech industries working for Macnica (audio/video over IP), Medtronic (medical devices), ASML (industrial controls), Motorola (set-top boxes), Qualcomm (satellite comm), IBM (compiler products), and startups
* 15+ years of real-time embedded SW development in C++/OOD/RTOS/Linux/FPGA
* Architectural, technical leadership, and project management SW experience
* Complete product cross-discipline development cycle including Agile/Scrum and global teams

Accomplishments

* Led SW teams and delivered SW intense projects (5-10 engineers) to research and productize real time embedded control systems for next generation of semiconductor lithography machines resulting in more than $1 billion new revenue
* Architected and hands-on developed major hard real time embedded applications controlling laser and plasma in microseconds and microns for EUV lithography machine automation
* Pioneered Model Based Development paradigm and SoC-based developments with auto-code generation for high frequency control systems using Xilinx Zynq platform

Technical Summary

Languages: strong C and C++ (10+ years)/STL/C++11, some ARM assembly
Real-time embedded systems: embedded Linux (PetaLinux, Yocto, OpenEmbedded), VxWorks 6.9 (10+ years)/SMP, Workbench 3.3, ThreadX, product development, cross-platform development, multicore, multithreading, TCP/IP stack, extensive debugging
High level embedded development: strong OOD/OOP (10+ years), UML diagrams, design patterns; control applications, platform middleware, memory management, IPC, distributed control systems, networking/sockets, testing, system integration, V&V
Low level embedded development: Zynq 7000 and UltraScale+ SoC, ARM Cortex-A9 and Cortex-M7, Linux kernel drivers, interfaces with FPGA, AV over IP networks, sensors handling, PCIe, SPI, I2C, UART, USB, JTAG, Segger J-Link, Wireshark
Technologies and tools: Linux development environment/Cygwin, GNU tool chain, Python, SWIG, JSON, Xilinx Vivado/SDK, Confluence, Eclipse, Code Collaborator, Crucible, JIRA, SVN, Git/GitLab, CI/CD pipeline, SourceTree, Google Test, catch2

Professional Experience

Software Consultant
Macnica Americas – Solana Beach, CA 09/2019 - present
* Developed an embedded media platform for Pro AV market based on Xilinx Zynq 7000 and UltraScale+ SoC (PetaLinux, Yocto, C/C++11, API to upper SW layers, Linux device drivers, interfacing media processing FPGA SoC, HDMI 2.0, advanced audio, UHD, 4K60fps video,

AV over IP networks – data link layer, ARP, IGMP, multicast, RTP, PTP, clock sync)
Software Consultant

Medtronic - Carlsbad, CA 07/2017 – 07/2019
* Developed and maintained flagship PB980 ventilator as a medical device (embedded/C++/ OOD/UML, ThreadX, ISO 13485, IEC 62304, safety critical breath control applications, DFMEA)

Staff Software Engineer & Architect

Cymer, an ASML company – San Diego, CA 05/2010 - 05/2017
* Delivered software for next generation of OEM lithography machines by architecting, developing, maintaining real time embedded applications - distributed control systems, opto-mechatronics, laser triggering and control in microseconds, plasma stability control in microns, motion control, complex time-space algorithms; cameras and image processing, advanced metrology sensors, safety/PLC, FMEA, stepper motors, PZT, LVDT, PWM, ADC, DAC; VxWorks 6.9 SMP, C++/OOD/UML, quad core multithreading, 50-100 kHz data acquisition, low latency processing, high throughput streaming, TCP/IP, IP multicast protocol, Altera GX95 FPGA, FPGA/SW Interfaces, PCIe, GigE
* Researched and prototyped embedded applications based on C++11, Model Based Development paradigm, SoC and high frequency (50-100 kHz) cameras (auto generation of C/Embedded Coder for control algorithms, seamless integration with existing systems, exposure to MATLAB and Simulink, Xilinx Zynq SoC, ARM Cortex-A9, Zedboard and ZC706, FMC, Vivado/SDK, AMP Embedded Linux & bare metal, Yocto tools, VM player with Ubuntu 14.04)
* Evaluated Silicon Software (Germany) Visual Applets package to auto generate image processing FPGA code for a high frequency (50-100 kHz) Mikrotron camera via CoaXpress
* Technologies, tools, and environment: MPC85xx, Intel i7, PLC, NI modules, Modbus TCP, CentOS 6.5 Linux, PostgreSQL, Python 2.6, Python(x,y), SWIG, Windows 7, Visual Studio C++, Qt framework, GUIs, SVN, JIRA, Code Collaborator, Crucible, TICS; network routers and switches

Software Consultant

Motorola, Inc. – San Diego, CA 03/2009 – 05/2010
* Delivered next generation of satellite set-top boxes by developing platform software/firmware; bringing board up/BSP/HAL, modification of disk file system, new flash file system with security, transition from MPEG-2 to MPEG-4/AVC/H.264 (VxWorks, BCM7335 SoC, MIPS, C/C++/OOD)

Software Consultant

Qualcomm, Inc. – San Diego, CA 04/2005 – 11/2008

* Delivered next generation satellite communication system for fleet management (Omnitracs) by architecting, developing and supporting air interface (CDMA-based OTA) as real-time embedded PHY Return Link of base station and MAC of mobile terminal
* Architected, developed and supported middleware and upper applications, memory management, fault tolerance, monitoring, logging, alerts, debugging framework, built-in-tests
* Development tools and embedded environment: C++/STL/Boost, OOD, UML, Rational Rose, VxWorks 5.5, Tornado 2.2.1, Perl, ClearCase, ClearQuest, GoAhead Web server; multiple shelves/boards/IO cards; GPS subsystems, Datum ET-6000 GPS receiver, Antaris GPS module, RF subsystems, AGC, DC Offset, PLL, A/D, baseband processing; ARM9, VisualDSP++

Software Consultant

IBM Canada Ltd. - Toronto Software Solutions Lab, Canada 10/2003 – 04/2005

* Developed XL C/C++ and Fortran compilers for AIX 5.3, RHEL 4, SLES 9, Y-HPC, Mac OS X 10.3 on pSeries p690 and P5 570, BladeCenter JS20, POWER5, PowerPC970

Software Consultant

SurveyPeople Corp. - Ottawa, Canada 04/2003 – 10/2003

* Designed and implemented survey applications on Solaris 8, Java/J2SE 1.3, JBuilder 7/8, Oracle 9i; Sun E3500 servers

Senior Software Developer

GridIron Networks, Inc., Ottawa, Canada 2002

* Delivered software product development and services for grid and distributed computing (MPI, OpenMP, HPF, Globus, DMTF CIM, P2P, Sun GridEngine, Platform LSF, etc.)

Software Developer

Nortel Networks Corp. - Ottawa, Canada 2000 – 2001

* Delivered software for first 3G UMTS RNC base station in real-time embedded multiprocessor distributed environment
* Designed and implemented High Availability Framework (HAF), Passport Journaling Framework successor, as a part of carrier grade OAM&P (check-pointing, journaling, hot standby, hot swap, in-service software upgrade, auditing)

Software Engineer, Systems Architect, Software Team Lead and Manager
Diverse companies - Chisinau, Moldova 1984 - 1999

Education

Moscow Engineering Physics Institute, Moscow, Russia, https://eng.mephi.ru/
* Received Master's Degree in Computer Science

Professional Development

* Architectural and project management training, ASML, 2016, San Diego
* Zynq All Programmable SoC System Architecture, Xilinx, 2015, San Diego, CA
* Design with an ARM-based SoC, Altera, 2015, San Diego, CA

* Developing Software for ARM-based SoC, Altera, 2015, San Diego, CA