Condensed Resumé of Robert J. Brown

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Education

Bachelor of Arts in Mathematics from Dowling College in 1973.

Graduate studies in Mathematics and Computer Science at Florida Atlantic University between 1983 and 1986.

Experience

Viavi Solutions, Wichita KS. 2020-2021. *Consultant.*
`(Python)`

Developed test scripts to test Army tactical hand-held COMSEC radios. These scripts are written in Python and run on a test instrument designed and developed by Viavi. These scripts implement tests equivalent to the factory test performed on the radios by the manufacturer, except that they are optimized for use with the Viavi radio test instrument. This instrument was being developed in parallel with these test scripts, so as much of the work was centered on finding and fixing problems with the instrument as on testing the radios. I was responsible for testing radios manufactured by L3Harris and Thales.

GE Aviation, Grand Rapids MI. 2019-2020. *Consultant.*
`(C, tcl, Xilinx, Zinq, Python, ARM-Cortex, petalinux, boot, FSBL, DOORS, MPsom, LabWindows)`

Performed systems test for SMC (Stores Management Computer) for AH-1Z Marine Viper attack helicopter. Developed markup language and python parser to automatically verify results from test log files generated by test run on AH-1Z test stand. Performed BIT verification tests for low level functions of hardware platform for the first stage bootstrap loader of a stores management system. This involved the injection of faults and tests to verify that the fault was properly detected. Developed test harness to automatically run these scripted tests, logging and archiving all relevant timestamped artifacts produced by the test. Modified EMI testing software to work with MPSCU device for MQ-25 Navy refueling drone for aircraft carrier deployment. Did root cause analysis for failure of a test for an avionics device on the F-35 fighter.

MSA Safety, Cranberry Twp. PA. 2018-2019. *Consultant.*
`(C, FreeRTOS, ARM-Cortex, Ble)`

Performed feature design, implementation, and unit test for a battery operated low power industrial gas detection sensor node. Multiple nodes are linked together on a low power grid network to a local hub that connects to a central server over the internet. Configuration is performed by a cell phone application using a bluetooth low energy (Ble) connection. I implemented the instrument configuration feature.

84.51° , Cincinnati OH. 2015-2018. *Consultant.*
`(C, Python, R, Linux, korn shell, Hadoop, Scala, NiFi, SAFe, Agile, Scrum)`

Participated on a scrum team of 4 software engineers to maintain, enhance, and productionize a big data, machine learning, retail replenishment forecasting system. Worked primarily in the areas of data ingestion and specialized database implementation for tree induction learning algorithm optimization. Performed code review, detailed software design, programming, and unit test. Customized tools for static analysis of C source code. Designed and implemented coverage tracking tool for korn shell scripts. Introduced python as a scripting language.

Rockwell Automation, Milwaukee WI. 2014-2015. *Consultant.*
`(C++, Python, IAR, ARM, EmbOS, IEC 61508)`

Participated in a team of 12 software engineers to develop high speed industrial controller I/O devices in compliance with the IEC 61508 functional safety standard. Performed requirements analysis and elaboration, requirements and code review, detailed software design, programming, and unit test. Championed use of C++-11 to solve problem of reference initialization causing boot-up time to take too long. Developed tools for static analysis of C++ source code. Developed framework for conducting automatic scripted unit tests. Designed functional safety compliant flash file system. Provided expertise to train less experienced engineers to work in a regulated environment.

Mueller Company, Chattanooga TN. 2013-2014. *Consultant.*
`(C++, XML, MSP430, git, Linux, DSS, Javascript, java, bash, Rhino, Eclipse, CodeComposer)`

Ported the MSP430 On-Target scripted testing framework (see 2012 QiG Group project below) originally developed for C to work with C++-11. Performed design reviews, code reviews, unit test, and integration test for a new data acquisition and telemetry product designed to operate unattended on battery power for 5 years without any other power source.

QiG Group, Cleveland OH. 2012. *Consultant.*
`(C, TFS, XML, MSP430, CCSV5, DSS, Javascript, java, SWIG, bash, NI-DAQ, Rhino, Eclipse, CodeComposer, Scrum, IEC-62304)`

Designed and implemented the MSP430 On-Target testing framework, a fully scripted automatic test facility. Used this to test an implantable neurostimulator medical device. This runs software unit tests automously, in accordance with IEC-62304 requirements for medical devices. This required interfacing the National Instruments DAQ (Data Acquisition device) with the TI CodeComposer DSS JTAG hardware debug device into the Mozilla Rhino scripting engine used to interface with the TI DSS debug server, which is written in Java. It also required automatically generating C source files used as scaffolding to conduct the tests, and automatically building the target image to include the scaffolding. Wrote Javascript software unit test runner as a collection of shell scripts. Wrote automatic test report generation software. Wrote test scripts to test the target device in this environment.

Rockwell Collins, Cedar Rapids IA. 2010-2011. *Consultant.*
`(C, C++, Python, XML, XSLT, Subversion, Windows-XP, RTX, AFDX, DO-178/B)`

Developed a test stand for a family of flight control computers for various regional jets. Implemented AFDX (Arinc-664) networking and interfaced the C code of the AFDX protocol stack to the Python language, as the test scripts to be run on the stand are to be written in Python. Implemented RBP (Reliable Burst Protocol), a TCP-like connection oriented protocol, on top of AFDX. Developed XML based configuration file format and processing code to configure the stand for the target aircraft.

IRD Balancing, Louisville KY. 2009-2010. *Consultant.*
`(C, C++, C#, CVS, Subversion, Windows-CE, 8051)`

Performed requirements gathering, requirements analysis, requirements elaboration, use cases, algorithm design and prototyping for a new computerized balancing instrument. The instrument is designed to handle small to very large rotors operating at 30 RPM to 100,000 RPM. The data acquisition and digital filtering takes place on a pair of 8051 cpus, and the statistical digital signal processing takes place on the embedded Intel based PC. The graphical user interface is streamlined to minimize unnecessary operator interaction. It is designed be multi-lingual for worldwide deployment.

Comtech Mobile Datacom, Germantown MD. 2008-2009. *Consultant.*
`(C, C++, CVS, POSIX, Python)`

Developed cryptographic software for a military satellite communications application (FBCB2). Performed reverse engineering and refactoring on legacy source code to prepare for NIST validation as a FIPS 140-2 and FIPS 140-3 (draft) cryptographic module. Designed power-up and self-test functions to place the module in FIPS mode. The module was implemented as a dynamic shared object (DSO) under RHEL 4/5.

Eaton Aerospace Actuation Systems, Grand Rapids MI. 2008. *Consultant.*
`(C, DO178-B, DOORS, ClearCase, perl, Python, DO-178/B)`

Performed SOI-3 readiness review and remediation for the Flap System Control Unit (FCSU) for the Embraer "Phenom 100" executive jet. Performed requirements engineering and traceability in compliance with DO178-B B level software. Designed and implemented interactive graphical software to perform call tree and stack usage and C programming language include file heirarchy analysis to satisfy reporting requirements. Designed and implemented software to automate the insertion of white and grey box test code into production releases of the source code.

Hamilton Sundstrand, Rockford IL. 2007-2008. *Consultant.*
`(C, DO178-B, DOORS, PPC-555, perl, python, DO-178/B)`

Performed systems engineering for the electrical power distribution system software and communications networking for the Boeing 787 "Dreamliner" passenger jet. Coordinated system integration efforts with Boeing in Seattle, Hamilton Sundstrand in Illinois, ECE in Paris, and TTTech in Austria, and subcontractors in Bangalore and Russia. Performed requirements engineering and traceability in compliance with DO178-B A level software. Designed and implemented software to auto-generate configuration data for electric power distribution equipment, solving complex problems that spanned three companies responsible for providing and deploying that data.

DRS Technologies, St. Louis MO. 2006. *Consultant.*
`(C, Linux, POSIX, VxWorks, X11R6, VNC)`

Designed X-windows software architecture to replace multiple displays, keyboards, and pointing devices (mice, touch screens, trackballs, etc.) on multiple computer systems from multiple vendors with a single Common Display that replaced all the seperate displays. The system is deployed in an Army ground tactical survielance vehicle. The earlier design with multiple displays crowded the operator and blocked his vision of the surrounding terrain. The new system saves space, battery power, and weight, as well as improving the soldier's ability to see the surroundings. The systems used X11 and a mix of embedded Linux and VxWorks. Custom ports of X11 and VNC tools, as well as data and image compression libraries were made to the VxWorks environment.

Awards

Mathematical Association of America Award. [1]

National Science Foundation Scholarship. [2]

Patents

U. S. Patent Number 4,847,781 for an *"Energy Management System."* [3]

Publications

Dreams: A Message Passing Object Oriented Metaphor for Forth. *The Journal of Forth Application and Research,* Vol. 6 No. 4. 1994.

A Timed Event Network Scheduler. *Dr. Dobbs Journal,* February 1989.

Committee Networks: What they can and cannot do. Proceedings of the 1987 Rochester Forth Conference, *The Journal of Forth Application and Research,* Vol. 5 No. 1.

An Efficient Algorithm for Large Priority Queues. *Dr. Dobbs Journal,* June 1987.

An Artificial Neural Network Experiment. *Dr. Dobbs Journal,* April 1987.

The Boca Raton Inference Engine. *Dr. Dobbs Journal,* April 1986.

[1] Avon Old Farms College Preparatory School, Avon, Connecticut, 1969.
[2] Dowling College, Oakdale, New York, 1972.
[3] Assigned to Associated Data Consultants, Inc.