DeaTech Research Inc

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Biotechnology & Embedded Systems
Software Development Services

Over 20 years in business.

Shannon Dealy - dealy@deatech.com

Embedded Systems	Molecular Biology	Scientific Applications
Real-time control	Custom Bioinformatics	Linux / UNIX
Performance Optimization	Internet / Web	Software Cleanup

Education

MSc Molecular Medicine, 2016, Erasmus University, Rotterdam, NL

B.S. Biochemistry & Biophysics, chemistry minor, 2013, Oregon State University, USA

B.S. Computer Science, 1983, Oregon State University, USA

Applied Lean Software Development, 2004

Skills

Languages	AWK, Bash/sh, Basic, Bison, C/C++, Flex, Forth, Fortran, Java, Lisp, Pascal, Perl, PHP, PLM-51, Python, R, Smalltalk, TCL
Biotechnology	Medical Devices, RNA-Seq, Custom Bioinformatics, Experienced with many standard lab techniques (flow cytometry, PCR, cell culture, Western blot, immunostains, etc.)
Electronics	Embedded systems, digital & analog electronic design and debug, system diagnostics
Processors/Assembly Languages	ARM, ATmega/Arduino, x86, MIPS, MC68000, MC68HC16, PIC, 8051, Z8, Z80, plus many other older architectures.
Database	JDBC, MySQL, PostgreSQL, SQL
Development Tools	CVS, Eclipse, Git, Make, Mercurial, NetBeans, PyCharm, RStudio, Testthat, Visual Studio, Unittest
Kernels & O/S	AMX, Linux, MS-Windows, QNX, UNIX, VRTX
Internet and Networking	Apache, CGI, Drupal, HTML, HTTP, JSP, TCP/IP, XML, firewalls/security, many other networking technologies
Administration	Linux, MS-Windows, UNIX, QNX, Networking, Backups & Recovery
Specialized Skills	Performance Optimization, Parallel Processing, Battery Powered Devices, High Reliability and Fault Tolerant Systems, Bar Code Scanning, RF Data Communication, Genetic Algorithms
Specialized APIs	FedEx shipping APIs, Adobe Acrobat plugins, Optical Character Recognition (OmniPage & Abbyy), National Instruments NI-DAQ

- Some of my past work -

NOTE: Due to overlapping time frames, projects are grouped by customer and customers are ordered based on the completion date of their most recent project.

Molecular Genetics, Aging Research Group - Erasmus Medical Center - 2015-Present

Worked on the development of two new techniques for measuring changes in accumulated DNA damage. Performed UV DNA damage experiments and created software in R to perform a novel form of RNA sequencing data analysis. Also made extensive use of Make and shell scripts on Linux for this project. Initial work performed as a master's degree internship, I am currently continuing and expanding on this work as a guest researcher.

Cell Biology, Stem Cell Institute - Erasmus Medical Center - 2014-2015

Used flow cytometry, PCR and immunostains, as well as RNA sequencing data analysis in order to examine differences in how BMP4, WNT and 2I maintain naive pluripotency in mouse embryonic stem cells (molecular medicine degree internship).

Gene Tools, LLC - 2004-2014

Worked as part of a small team to create, maintain and perform upgrades on an integrated web based e-commerce and production management system using Drupal, PHP and MySql. I was responsible for writing most of the core classes that managed user data input, validation and database access. Also wrote the software for managing packing and shipping of orders including interfacing to the FedEx computer systems for domestic and international shipping. Most recently, converted the shipping software from the FedEx tagged transaction API to their newer web services API and updated the software to work with Drupal 7.

Hays' DNA Repair and Mutagenesis Lab - Oregon State University - 2012-2013

Performed DNA mutation experiments on genetically engineered Arabidopsis plants and wrote software in Perl for analysis of sequencing data (biochemistry and biophysics degree internship).

Trapezy Inc. - 2007-2011

Developed an Adobe Acrobat plug-in in C++ which uses OCR technology to identify any one of over 8,000 standard forms in a document and bookmark each page accordingly.

Air-Weigh - 2007, 2010

Created device drivers in C for a newly developed ARM-7 processor board used in the trucking industry. Drivers included: UARTs, SPI, I²C, EEPROM, A-D converters, timers and digital I/O. Provided debugging support for finding problems with their existing software and hardware.

Pajaggle, Inc. - 2009

Created an Adobe Flash compatible version of Pajaggle's board game products to be used as a marketing tool for online product promotion.

Meteor Communications Corporation - 1986-2004

Developed a web server platform using Java servlets, Java Server Pages (JSP) and a PostgreSQL database back end, which provided Internet access to an RF data acquisition network. Features included secure command interface to the radio relay units, web based system administration and status monitoring, configuration of data acquisition parameters, security protocols to allow customers to only access data and configuration for their units and user configurable data report generation / display. Worked with MCC's software developers to create system and software specifications; designed and coded all of the server software; configured and installed a Linux based server platform.

Created device drivers and hardware diagnostics in C and assembly language for a MC68332 microcontroller to manage an RF data communication link.

Analyzed a network of 8051 micro controllers controlling an RF communication link for causes of performance problems and numerous bugs. Made major software changes (in 8051 assembly and PLM-51) and devised field installable modifications to fix the hardware bugs, increasing system throughput to more than four times its best prior data rate.

Other projects performed for Meteor Communications include: development of test/diagnostic software for use in PC board manufacturing; custom QNX device driver written in C for data acquisition; debugged several existing products, correcting a number of core hardware and software design problems; developed software to interface a GPS unit to a data communication system; ported a data acquisition and RF communication program to a new hardware platform; re-designed and coded software on a data acquisition unit to reduce memory consumption by 40%.

Ortech Industries Inc. - 2002

Modified software written in PIC assembly language (MPASM), for a pellet stove control system. Changes included finer timing resolution and more flexible sequencing for the ignition system.

Inovise Medical, Inc. - 2000

Designed and coded scripts to perform automated testing of a critical care, patient monitoring unit.

BioAnalogics - 1999-2000

Analyzed an existing software development/release system for causes of inconsistencies in released code and created a single uniform build process to eliminate the release problems. Made recommendations for user interface design changes, addressing internationalization issues and design/implementation of a next generation version of the software.

Althin Medical Inc. - 1996-1998

Performed software cleanup on a kidney dialysis machine (originally 130,000 lines of C code). Converted to C++, redesigned algorithms and restructured the software for easier maintenance. This reduced the executable by 20% and source code by 45%, as well as fixing many bugs while maintaining 100% of the original features and user interface.

Wygant Scientific - 1995-1996

Developed software in C for a computer to perform digital voice recording in a networked client/server environment, using a National Instruments data acquisition card. Devised an algorithm which allowed an Intel 486/66 based computer to acquire data and perform real time ADPCM compression on 48 simultaneously recorded channels.

Egyptian Ministry of Public Works and Water Resources - 1993-1994

Created and taught an intensive four week course in advanced C programming tailored to the needs of the Ministry's programming staff. Gave additional introductory lectures on real time software design, multitasking, database design and computer graphics. Developed a program in C to collect data from the Ministry's Nile river monitoring system.

Physio Control - 1993-1994

Wrote software using Lex, Yacc and C to analyze C source code for data dependencies in order to set software testing and validation priorities for a heart defibrillator unit. Setup a custom configured UNIX computer system to streamline the software build process, reducing the build time from several hours to less than 10 minutes. Worked as part of a team of engineers writing software requirements and test scripts used in software validation.

Biotope, Inc. - 1990

Created a custom file system and C language system calls for a blood analysis device. Developed software to use the analyzer's optical data acquisition system for reading bar codes. Wrote a text and graphics display driver for the system's LCD display. Performed system administration for a network of Sun workstations.

Process Solutions - 1989-1990

Wrote software specifications, designed and coded a program in C to allow a PLC-5 industrial controller to use an IBM PC for serial communications and as a user interface to a weighing system used for packaging food products.

Coastal Climate Corporation - 1989-1990

Performed extensive redesign and maintenance work on a PC based meteorological data acquisition, display and analysis system written in C. Greatly reduced the size of the source code, improved performance and eliminated many bugs. Also added a number of new features to the software, including improved system configuration capabilities.

Sage Electronics - 1989

Developed a Windows based user interface program in C for configuration and real time monitoring of a building energy management system. Also wrote a program in Lex and C to parse the software specification document for this project and generate source code defining all dialog boxes and screen displays (involving thousands of data fields) for this program. Use of this parsing program saved at least a month of development time.

International Biomedics Incorporated - 1988-1989

Head of software development. Worked with the Quality Assurance department to create specification, design and coding standards so that all new commercial software releases would meet FDA requirements. Wrote software specifications for a fetal tissue pH monitoring unit. Created a device driver in C to allow a PC printer to be used as a medical strip chart. Began development of a C language firmware core to allow replacement of much of the custom software in the fetal monitoring equipment with standard display, printing and networking drivers available from commercial vendors.

Texas Instruments - 1983-1986

Worked as part of a test group for a new computer under development. Wrote programs for testing the new hardware, performed general trouble shooting (hardware and software) of problems with both the test-bed system and the system under test. Performed hardware and software validation of an IEEE-488 interface card. Designed, coded, wrote test procedures and maintained a series of programs used to enhance the capabilities of a CAD system. Wrote requirements, design and maintenance documents, as well as user manuals for various programs.

Other projects - 1983-Present

C++ programming and debug of a RepRap 3-D printer. Designed a co-processor for the MC68020 to virtualize other processor architectures. Created a program in C and Java for nutritional and agricultural analysis using genetic algorithms. Ported FIG Forth to the Z8 microcontroller. Currently developing health optimization software using Python and Django.

From the beginning, DeaTech Research has run on UNIX based systems, switching to Linux as the primary operating system in 1994. Maintaining servers on the Internet and additional systems in the office for over 20 years has given me a great deal of experience with Linux custom kernels, virtualization, device drivers, shell scripting, networking and security.

Presentations to Oregon computer groups: implementation of custom firewalls; virtual computing environments for development and testing; creating reliable system backups; advertising techniques for computer consultants; managing a software business and developing software while traveling.