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EXPERTISE/SKILLS

Programming Languages
C++, Java, Lua, Objective-C, C, SQL, assembly (multiple architectures), bash & gawk scripting, Pascal, FORTRAN, Lisp/emacs-lisp, HTML, CSS, and familiarity with others.

APIs & frameworks
UI and general-purpose: Qt; JFC/Swing; NeXTStep/OpenStep AppKit (predecessor of Mac OS/X Cocoa); Some familiarity with others, e.g. Borland C++builder/Delphi, J2EE. Designed and coded my own full-screen TUI package, including fields, menus, pick-lists, context-sensitive hypertext help, etc., as well as many other low-level and mid-level APIs.
Other special-purpose: OpenMP, libnetfilter_queue, libgps, others.

Operating Systems
Unix/Linux (many distros), NeXTStep, Microsoft Windows, MS-DOS, mainframe OSs. Apple-DOS, UCSD p-system. Intimately familiar with Unix, GNU/Linux, & POSIX API programming.

DBMS

- Developed software using & PostGreSQL, Sybase/MS-SQLserver, MySQL, SQLite, and others, including custom-built database backends.
- Administered PostGreSQL.
- Connectivity frameworks: JDBC, QtSql, other custom-build adapter frameworks.
- Designed and coded systems using custom-built database access and/or database management modules, implemented various low-level storage and search techniques such as B-trees, hash tables, etc., over various message-passing and shared-memory transports; client-server, peer-to-peer, and single-process.

Other expertise & experience
Linux (Redhat-based & Debian-based) and Unix (SysV & BSD) system administration, network administration, system security, signal/communications security, intrusion detection, sniffing & protocol analysis, secure storage, cryptography, git, trac, flex, PC hardware & system-building, analog electronics design & construction, data-encapsulation and OO design and architecting, structured and secure coding practices, project management, team building and coordination. Design of various custom networking protocols such as single-roundtrip RPCs, zmodem-style fast file transfer over UDP, bonded multi-path routing over IP, etc.

SysAdmin
Experienced in administration of Linux servers, Apache 2, PostgreSQL, Postfix, SpamAssassin, Dovecot, Asterisk (developed a custom table-based call routing system), OpenVPN, DHCP server, DNS/BIND, Linux routing, most standard Unix/Linux facilities, filesystem/volume management (dm/LVM2/LUKS, raid/mdadm, etc.). Extensive shell scripting. Some familiarity with administering various other facilities.

EXPERIENCE

08/07 – present

Contract consultant, Center for Health Services Research at Henry Ford Health System, Detroit, MI.

- Developed an enhancement to a widely-used GPL human-genetics research modeling software to extend the model from individuals to pedigrees. The peer-reviewed paper for

the enhancement is not yet published.
    - Created lexical analyzer and parser for pedigree files and various other input files.
    - Created various graph representation, traversal, manipulation structures and algorithms.
    - The low-level state-transition modeling uses a Hidden Markov Model to evaluate likelihood of a given set of observed genotyped inputs and modeled parameters.
    - The higher-level statistical modeling uses the Metropolis-Hastings algorithm to refine the modeled parameters to better fit the data via a "random walk" sampling.
    - Extremely computationally intensive; I implemented concurrent shared-memory execution using OpenMP.
- Developed epidemiological research system:
    - Utilized by the SAPPHIRE study.
    - Implemented using Qt, PostGreSQL
    - Platform-independent GUI front-end, runs on Linux, Windows, or OS/X
    - Participant tracking, participant surveys, integrated database with pulmonary function and other medical record data, sample tracking.
    - Patient surveys via custom-built runtime form-description module using sexp-based (lisp) file formats, custom parser, evaluator, and GUI-generator, with dynamically-built Qt presentation.
- Maintain computation-server for genomic and biostatistic research, assisted biostatistical staff; compilation and installation of various open-source genomic analysis tools.
- See publications.

09/05 – 07/06 **Contract consultant, CareTech Solutions, Troy, MI.**

- Migration of 15-year-old legacy C++ application to modern compiler [gcc-4] and operating system [Linux, Solaris 10]
- System configuration of Solaris 10 on Sparc, network integration
- Personally ported, tested, debugged 400,000 lines of C++ code.
- Developed plan for parallel testing and implementation

06/04 – 10/04 **Contract consultant, CareTech Solutions, Troy, MI.**

- Contributed to the design and coded portions of a hospital information system in Java (JFC/Swing front-end, J2EE+WebLogic middle-tier, Sybase backend).

05/04 **Contract consultant, CareTech Solutions, Troy, MI.**

- Developed complete middle-tier business-function requirement document for an orders management system, to be implemented in J2EE.

11/03 – 01/04 **Contract consultant, Henry Ford Health System, Detroit, MI.**

- Provided analysis and consulting regarding the development and purchase of an order-entry, clinical data analysis, and clinical workflow system.
- Designed and coded a workflow engine in Java, accessible via SOAP web-services, utilizing JWSDP/JAX-RPC.

03/02 – 07/02
10/02 – 04/03 **Contract consultant, Providence Hospital, Southfield, MI.**

- Provided analysis, design, and coding of a prototype in-house developed decision support system, utilizing Borland C++ Builder™ under the Microsoft™ Windows® operating system.
- Designed and coded a prototype template-based documentation system in Java using JFC/Swing components.

04/01 – 06/01 **Contract consultant, Henry Ford Health System, Detroit, MI.**

- Provided analysis and support for the purchase and implementation of a medical-records document-imaging system.

10/89 – 10/99 **Director of Information Systems Development, Mt. Clemens General Hospital, Mt. Clemens, MI.**

- Director of the department of Information Systems Development. Supervision of 8-10 employees including management employees. Built the department from the ground up; hired all employees.
- Designed, coded, and implemented the Patient Care System (PCS), a comprehensive, integrated enterprise-wide hospital information system application comprising order management, enterprise and operating-room scheduling, nursing care-planning and documentation including intra-operative documentation, template-based physician's documentation, clinical data repository, communications system, electronic patient medical record, and many other modules, deployed onto over 250 workstations at 50 remote sites with over 1,500 users. Developed many utility-level modules including automatic software distribution, automatic centralized error logging, remote daemon control, etc. Believed to be the first enterprise-level health care client-server application, this system has been in operation for 10+ years and has received multiple international recognitions for its superior architecture, cost-effectiveness, and innovative adaptation of technology.
- Design and project manager of major software development projects, including: operating room system, patient care system (described above), multi-entity corporate general ledger system, fixed assets tracking system, cost accounting and management reporting systems.
- All development under the Unix operating system, on both NeXT workstations and iAPX386/486/Pentium machines, using C, C++, Objective-C, and other languages.
- Installed institution-wide 10base2 and 10base5 TCP/IP network, and custom developed many network management utilities.

1/88 – 10/89 **Director of Financial Information Systems, St. John Hospital, Detroit, MI. (hired as Senior Financial Analyst)**

- Worked in the finance department. Was promoted to Director of FIS in 2/89. Supervised 1 employee.
- Designed and coded financial and management information systems in C under SCO Unix and MS-DOS, and in Easytrieve under DOS/VSE. Wrote custom database server for budget application.
- Systems include financial and statistical budgeting system, A/P system, on-line payroll reporting system.
- Wrote terminal emulator under MS-DOS including interrupt-level RS-232 communications.

6/86 – 9/86
6/84 – 9/84 **Contract programmer, St. John Hospital, Detroit, MI**

- Designed and coded financial systems in Pascal under MS-DOS, in Condor 4GL/relational DBMS under MS-DOS, and in Easytrieve under DOS/VSE.
- Systems include financial reporting system and small payroll system.

6/85 – 12/85 **Programmer, Analysis & Technology, Middletown, RI.**

- Coded modules of major naval anti-submarine warfare software system in FORTRAN-77 under HP-UX.
- Carrier-based system to analyze sonar data from multiple sources, predict optimal sonobuoy placement, run simulations of submarine movement, etc.

9/82 – 9/83 **Contract Programmer, Henry Ford Hospital, Detroit, MI.**

- Designed and coded financial & database systems using FORTRAN, Easytrieve, and

Focus under OS/MVS.

- Systems include calculation of production accounting entries based on reimbursement formulas and database query-processing system to produce reports from heterogeneous sources of data.

6/82 – 9/82 **Student Intern, Wayne State University Physics Department**

- Worked in imaging lab on non-destructive-testing photoacoustics project. Coded in FORTRAN under MTS.
- Coded programs to calculate thermal responses of materials based on theoretical calculations and produce 3-dimensional plots from results.
- Designed and coded systems to manipulate data collected from photoacoustics experiments and produce 3-dimensional plots from results.

MISCELLANEOUS

Awards:

Won by the PCS application developed at MCGH:

1st place: 1994 DB/EXPO Intel RealWare Award for Best Enterprise Client/Server Application.

1st place: 1994 Computer World Magazine and Object Management Group Best Use of Object Technology within an Enterprise or Large System.

2nd place: 1998 Modern Healthcare First Annual Innovation in Healthcare Information Technology, Best Return-On-Investment (ROI).

U.S. National Merit Scholarship, 1983

1st place: 1982 Michigan Math Competition for High-School Students

3rd place: 1981 Competition in Mathematics, Lawrence Institute of Technology

Education: B.A. in Mathematics, Brown University, Providence, RI., May, 1987. Studied many computer science topics including artificial intelligence, compiler design, database design, analysis of algorithms, etc. Mathematical topics included functional analysis, differential geometry, complex analysis, partial differential equations, topology, abstract algebra, probability & statistics.

Publications: *(Named Author on All Papers)*

- Differences in allergic sensitization by self-reported race and genetic ancestry, J. Yang et al., The Journal of Allergy and Clinical Immunology, Volume 122, Issue 4, October 2008
- Quantifying the proportion of severe asthma exacerbations attributable to inhaled corticosteroid nonadherence, LK Williams et al., Journal of Allergy and Clinical Immunology, Available online 21 October 2011
- A Multilocus Genetic Model Applied to the Effects of Selective Fishing on the Growth Rate of Trout, L. D. Favro et al., Canadian Journal of Fisheries and Aquatic Sciences, Volume 39, Number 11, November 1982

Languages: Native English speaker; fluent in French; proficient in Vietnamese.

Hobbies: Musician, bicyclist, squash player.

References, Example Code: Available upon request.
