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SUMMARY

I am a software developer with 18 years of software development experience in both Microsoft and Unix (AIX) development environments. I have particular experience and skill in C family languages (C, C++, Java, Javascript, C#), and my current project is cross-platform mobile app development in HTML5 Javascript. You can see my programming skills by viewing the source of my Conway's Game of Life implementation here:

http://isaackuo.no-ip.org:8880/ijk/apps/lifecommand/SpeedAcorn.html

It features an algorithm of my own devising, which takes into consideration Javascript's specific limitations and features, and showcases my problem solving skills and careful documentation of complex novel algorithms. This Game of Life implementation is blazing fast compared to other Javascript implementations out there.

Such performance is actually quite important for the target iPhone platform, since the iPhone is not particularly powerful, Apple's Safari javascript implementation is particularly inefficient, and battery life is a major consideration for mobile apps.

TECHNICAL SKILLS

Application Languages:
C, C++, Java, Javascript, C#, Foxpro, VB, VB.Net, Scheme, Python, Fortran, Matlab/Octave, Assembly (68K, 6502)

Scripting Languages:
bash (Linux), sh, ksh (AIX), TFS/BizTalk build and deployment scripts

Mobile/Web Technologies:
Javascript, XML, SVG, HTML5, XHTML1.0

RDBMS:
MS SQL Server, DB2, Foxpro, Access, Oracle

Linux/Unix Technologies:
Debian, Ubuntu, AIX, ssh, sshfs, rsync, nfs, samba, PXE, DHCP, diskless netboot, both graphical and console only administration, administration from live CD, LAMP stack

Health Care Specific:
HIPAA X12 837I, 837P, UB92, UB04, 1500, 1505 formats

EMPLOYMENT

Blue Cross Blue Shield of Louisiana October 2000 – February 2013
Programmer Analyst, Environment Manager

- Most of my time spent at BCBSLA was in teams developing EDI systems for health insurance claims and eligibility processing, for both internal Blue Cross claims and acting as a clearinghouse for other payers—including Medicare, Medicaid, and various commercial claims.
- I started as a developer for a Foxpro electronic billing software system called ClickON by SSI due to my previous Foxpro experience, and became the main expert on the system. I trained contract programmers on developing for the system during the HIPAA transition. This system upgraded from Foxpro to Visual Foxpro 5, Visual Foxpro 6, VFP with Microsoft SQL Server backend, and finally a web based client server system with IIS, VFP, and SQL Server backend. I developed print image and billing extract translators for UB92, UB04, 1500, 1505 formats. I used SQL queries extensively in this role.
- For HIPAA 4010 and HIPAA4010A, I developed for an IBM eGate solution using AIX, java, Monk (a Scheme variant), and Connect Direct (ftp, ftps). I developed java and Monk code, as well as ksh scripts in AIX. The backend database was DB2; I used SQL queries as necessary in DB2 for processing data. I developed file processing code for reading and processing X12 837I and 837P formats, as well as XML wrapped debug output and HTML formatted reports
- For HIPAA5010, we developed a BizTalk solution with WCF services; I acted mainly as the build master and environment manager, coding BizTalk build scripts and deployment scripts in TFS, and debugging BizTalk and C# code as necessary to get builds to work properly.
- In addition to those main application suites, I developed and maintained various smaller applications in C++, Visual Basic, WS_FTP Pro, and FileLink, using ftp, ftps, sftp, zmodem, and NetX protocols. One of these applications used an Oracle database on the backend, which I rarely used SQL queries with.

Responsibilities:

- BizTalk environment manager, managing Dev/SIT/UAT/Prod environments for BizTalk and related WCF web service applications in BizTalk, C#, Asp.Net
- TFS build master, coding BizTalk and WCF service build scripts and deployment scripts
- Debug C# code as necessary to get builds to work properly
- C++ application development for parsing and processing X12 format 837I and 837P files
- C++ XML parsing and processing
- C++ HTTP report file parsing, splitting, and preprocessing for automated FTP/e-mail processes in FileLink and WS_FTP Pro
- Code FileLink, WS_FTP Pro, and Windows .bat scripts for automated FTP/FTPS/NetX, e-mail, zmodem file transfers and problem notifications
- Java, Monk (Scheme) parsing of X12 format 837I and 837P files, and edits for Medicare and Medicaid
- Administration and customization of eGate/ConnectDirect/AIX system
- Code AIX ksh scripts for automated and manually kicked off tasks

- Convert legacy VB6 application from zmodem communications to secure FTP (ftps) with ConnectDirect on custom port
- Support and customize applications for clients statewide, via Webex, PCAnywhere (modem), and even over the phone as necessary
- One on one training of contract employees in Foxpro application development
- Testing and validation of contractor code and vendor supplied updates

Environment: BizTalk, TFS, C++, Java, Monk (Scheme), Foxpro, IIS, SQL Server, Oracle, DB2, VB, VB.NET, C#, ftp, ftps, sftp, zmodem

Diamandel Diamonds May 1999 – February 2001
Database Consultant

- Diamandel Diamonds used a legacy Foxpro RDBMS application designed for diamond merchants

Responsibilities

- Repair customized Foxpro reports and data
- Enhance Foxpro application with new SQL queries and reports
- Tech support for Windows 98 workstation

Environment: Foxpro, Windows 98

Summit Hospital April 2000 – May 2000
Database Consultant

- Summit Hospital used a legacy Access 2 RDBMS application for some reporting, but the application stopped functioning properly. I did some troubleshooting and figured out the cause was bad data resulting from not all workstations having the same Y2K date settings.

Responsibilities

- Troubleshoot Access 2 RDBMS application
- Repair invalid data
- Modify application to accept 4 digit years and validate entered data to prevent future bad data

Environment: Access 2

Formosa Computers January 1995 – January 2000
Database Programmer

- Formosa Computers is a retail computer store specializing in state contracts and tech service—both in store and on site. They use an in-house Foxpro database system to manage all aspects of the business, including quotes, invoices, service jobs, detailed inventory tracking (including integration builds and service jobs), accounts receivables, payroll, state contracts, credit card processing, and so on.

Responsibilities

- Extensive use of SQL queries and optimization for development of Foxpro application programs
- Maintain and replace legacy Foxpro database POS and Tech Support ticket application programs
- Integrate UPC and serial number scanning hardware with system; develop Foxpro software to accept scanned info
- Integrate credit card scanning and calling hardware and software with Foxpro system;

develop Foxpro software for calculating and processing credit card payments
- Develop new Foxpro screens and databases, including serial number specific inventory tracking, accounting databases, and payroll
- Maintain and upgrade Novell Netware LAN
- Convert Foxpro database systems for Y2K compliance

Environment: Foxpro, Novell Netware, DOS, OS/2, Windows 3.1, 95-98SE, NT-2000

SIDE PROJECTS

Mobile/Web apps

Developer, UI Designer, Web Server Admin

- I develop mobile/web apps using HTML5 Javascript and the canvas element for maximum cross-platform compatibility. While optimized for the iPhone, these apps run on other mobile devices and desktop web browsers—including Linux and Mac.
- LifeCommand combines Conway's Game of Life and the classic videogame Missile Command. The app's source code also demonstrates my abilities to devise and document novel optimized algorithms (an interesting challenge in javascript). My Game of Life algorithm is extremely fast, compared to other javascript implementations.
- Bunny Dozen is a single button game I developed in one week to celebrate Easter. I did all of the artwork, including the font, in this time. The game is surprisingly deep, even though the only control is a “hop” button to hop forward. You control many bunnies at once, but you have to keep in mind which bunnies are boys and which are girls, since only bunny pairs will give you bonus bunnies at the end of the level.
- http://isaackuo.no-ip.org:8880/ijk/

Debian GNU/Linux Software Development

XPenguins flicker-free code in C

- XPenguins is a native Linux application written in C, but the code naively erases all sprites before redrawing them, resulting in extreme flickering when there are many sprites. I rewrote the code in C to check for overlapping sprites and to organize them into minimum size groups of overlapping sprites. This completely eliminated flickering even with thousands of sprites on screen at once.
- This code demonstrates my abilities to create novel algorithms and data structures and implement them efficiently and accurately. It's not immediately obvious even what sort of data structure to use to solve this problem. I decided to use a simple array, which starts each frame initialized to 1...n—meaning each sprite is numbered to its own group. Then, sprite collisions are checked for; every time a collision is detected between two sprites of different groups, the two groups are merged by renumbering the higher numbered group to the lower number

HOW-TO: RAMboot for speed and silence

- My RAMboot boot method used busybox and bash shell scripting.
- I developed a method to run Linux entirely within RAM, with an initrd.img shell script which creates and mounts a tmpfs ramdisk for root rather than a traditional hard drive. The hard drive stores this initrd image as well as the main OS, which is copied over to the tmpfs ramdisk by the custom shell script.
- http://forums.debian.net/viewtopic.php?t=29774

- http://www.linuxquestions.org/questions/linuxquestions-org-member-success-stories-23/how-to-boot-os-into-ram-for-speed-and-silence-662116/

Network Booting

- I implemented network booting for remote installation of Debian, thick client diskless workstations, and thin client diskless X stations
- Remote installation was particularly useful for installations to computers which lacked CD drives
- Thick client netboot diskless workstations were useful for home theatre and productivity machines with powerful processors and ram. Besides saving money on hard drives, it also resulted in nearly silent workstations (along with other silencing mods). It's also convenient for backing up and centralized administration on the main file server, even with the client workstation completely powered off
- Thin client netboot diskless X stations were useful for web browsing and productivity on older machines with little ram. Even a 100mhz Pentium could do a decent job of browsing most web sites, and such a diskless workstation can produce so little heat as to be easily modified into a fanless solid state computer simply by removing all fans (depending on the size of the CPU heatsink). A 400+ Mhz Pentium II offers much better responsiveness, though, and can be nearly silent by removing the CPU fan and undervolting the PSU fan to 5V (as opposed to the standard 12V).

File systems

- I have experimented with various unusual and experimental filesystems, in various ways to squeeze more power, performance, and flexibility from multiple hard drives. This includes software RAID0, aufs (had to combine with smbfs and sshfs in order to share, since it didn't work properly with nfs), tmpfs

Postcards from Cutty

Author, Web Server Admin

- My web site features hand coded xhtml code compliant with XHTML1.0 standards. I host it on my own Debian based web server (LAMP stack). *Postcards from Cutty* is an experimental single panel web comic, relating space science and linguistics concepts. I am developing a new series continuing it, but in a mobile webgame format—called *pfc minigames*.
- http://isaackuo.no-ip.org:8880/pfc/pfc001.html

Project Rho

Atomic Rockets contributor

- Atomic Rockets is a resource for hard SF authors and game designers, including scientific information on rocket technology, orbital mechanics, space power systems, sensors, etc. I am one of the contributors of calculations and scientific info, with an emphasis on orbital mechanics concepts, navigation, and calculations.
- Much of the content is inspired by discussions on rec.arts.sf.science, Bad Astronomy and Universe Today forum, and sfconsim-L
- http://www.projectrho.com/public_html/rocket/index.php

NASA Innovative Advanced Concepts 2012

Lithobeam Launch – Kinetic Impactor Powered CATS with Retrograde NEA ISRU

- For NAIC 2012, I proposed a system for boosting single stage suborbital client vehicles to orbit using streams of kinetic impactor drones launched from retrograde asteroids

such as 2009 HC82.
- Calculations and simulations implemented in Python and Octave (open source MATLAB compatible programming language specializing in scientific matrix math)
- http://www.nasa.gov/directorates/spacetech/niac/index.html

DARPA 100 Year Starship Study Symposium
Single Stream Propulsion for Fast Interstellar Return Missions
- For 100YSS 2011, I proposed a relativistic propulsion system for the time/distance track. This system uses laser sail drones impacting puffs of on board inert propellant to allow acceleration/deceleration both away from and back toward the home system. The capability to accelerate back toward the home system is particularly novel, for beamed propulsion systems.
- Calculations and simulations implemented in Python and Octave (open source MATLAB compatible programming language specializing in scientific matrix math)
- http://symposium.100yss.org/

EDUCATION

Cornell University August 1988 – May 1992 Ithaca, NY
B.A. Math, B.A. Computer Science

REFERENCES

Available upon request