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Job Objective: a software or hardware engineering position using my design, programming and engineering skills

Education

2001-2004: Portland State University, BS in Computer Engineering, September 2004 (3.3 GPA)
1998-2001: Mount Hood Community College, AA degree (3.4 GPA)

Select PSU courses: Analog Circuits 1 (filter design), Analog Circuits 2 (BJT level VCOs, gain stages), Analog Circuits 3 (phase locked loops, CMOS and NMOS logic), Microprocessors (ARM), Microprocessor Interfacing (ARM), Verilog, Neural Networks 1, Neural Networks2/Fuzzy Logic, Programming Operating Systems (Unix based), Programming Systems (Unix based), Software Engineering

Technical Skills

- Program software in C/C++ using either a Unix/Linux (GNU/CVS) or Windows (Visual Studio) platform. Skilled in using COM and MFC to develop windows DirectX and computer vision applications.
- Create multimedia solutions using Macromedia Flash and Director that often interact with hardware.
- Design and simulate analog circuits using Spice, or program synthesizable digital circuits in Verilog/VHDL.
- Use SQL, Oracle PL/SQL, XML, XSLT and Access with Coldfusion and PHP to create database driven web applications, or to perform database migration.
- Accelerate work flow with Regular Expressions and scripting languages such as Perl and Python.
- Knowledge of implementing computational intelligent systems such as fuzzy and neural network controllers.
- Create 3D scenes using 3D Studio Max and techniques such as mesh and patch modeling.

Work Experience

8/02 - present: Software developer, Portland State University
For NW Computational Intelligence Laboratory, develop software in C++ to demonstrate the learning dynamics of Self Organizing Map (SOM) neural networks. Develop and maintain Portland State's PHP/Oracle web-based content management system for major university websites. Develop and maintain Zope-based website for Office of Institutional Research and Planning.

3/01 - present: Software developer, Oregon Museum of Science and Industry (OMSI)
Develop websites and multimedia software for exhibits using Coldfusion, Flash, Director and C++.

4/00 - 3/02: Educator, OMSI
Designed high technology educational activities for K-12, explained and delivered them to visitors.

1/00 - 1/01: Sound technician, Mount Hood Community College
Toured with the Genesis Jazz Choir to manage mixers, equalizers, compressors, monitors, and effects equipment.

9/98 - 6/01: Lab monitor, Mount Hood Community College
Assisted students with software and hardware issues in the college computer lab.

9/98 - 6/00: Designer for Theater Department, Mount Hood Community College
Built new departmental website and developed theatrical sets using 3D software.

Interests: programming in general, soft computing (especially neural networks and fuzzy logic), biking, jazz drumming

References

George Lendaris, Ph.D.
Professor, Systems Science and Electrical Engineering, PSU
Email: (available upon request)
Phone: (available upon request)

Ray Vandiver, Ph.D.
Vice President of Exhibits, OMSI
Email: (available upon request)
Phone: (available upon request)

Nathan Angell, MS
Assistant Director for Web Communications, PSU
Email: (available upon request)
Phone: (available upon request)

OMSI Select Projects

Listen Up!

This kiosk activity is a computer game mixed with a hearing test. A player progresses through the game by hearing a series of tones in a certain ear, then pressing but tons in response. At the start of the game, the player can choose to participate in an Oregon Health Science University (OHSU) study by answering demographic questions and having their survey results added to a database.

Another programmer and I made the activity in Macromedia Director. First we worked with hearing test hardware developers to create a protocol over RS-232 to communicate with their equipment. Then we developed a way via HTTP for the application to provide the test results to a database we made for OHSU's researchers. We also created a backup system to store the survey results locally on the kiosk if internet connectivity is lost.

Get Real

A team consisting of another programmer, a developer, and I created a computer game called "Get Real" for the Exhibit *Moneyville*. This game, developed in Macromedia Flash, presents users with real-world financial decisions. The programming is completely object-oriented and written in *Actionscript*.
(downloadable at: http://skylab.org/~sam/archives/2004/07/get_real.php)

Portland State University Computer Engineering Select Projects

Senior Capstone: Interactive Space

For my senior capstone project I led a team of five students to create an audio/spotlight tracking activity for OMSI. I also wrote the software to track people and control the spotlight using Microsoft Visual C++, Microsoft DirectX 9 API, Microsoft Foundation Classes (MFC) and Intel's Open Computer Vision (OpenCV) libraries. Accomplishments:

- Created a substantial C++ Windows GUI application.
- Explored different types of computer vision to obtain a tracking solution, including Motion History Imaging (MHI) and Optical Flow. Implemented Optical Flow with custom tracking rules.
- Learned COM basics to use DirectX resources for video (Direct Show) and sound (Direct Sound).
- Created 9-point calibration scheme using linear interpolation to correct for camera fish-eye lens distortion.
- Gained project management skills.

The project is currently available to the public at OMSI.
(further information at: http://skylab.org/~sam/archives/2004/07/senior_capstone.php)

Phase Locked Loop

For the PSU electronics sequence a project partner and I spent three terms creating a phase lock loop (PLL). We created the PLL from scratch using the Tektronix Spice based simulator *Analog Design System* (ADS). We started by receiving the output filter specification, and designed a 12^{th} order Butterworth filter to implement it. Next, we created our own differential amplifiers using BJT transistors and replaced the ideal gain stages in the filter. After that we created an Emitter Coupled Multivibrator (ECM) voltage controlled oscillator (VCO) and multiplier based phase detector, then connected the pieces together. We tested the PLL by using it to demodulate an FM signal.
(further information at: http://skylab.org/~sam/archives/2004/07/phase_locked_lo_1.php)

Neural Paint

For my senior level electives, I chose the Neural Network sequence. For the second term project I implemented a Self Organizing Map (SOM) Neural Network with Macromedia Flash MX 2004's scripting language *Actionscript II*. I then created an activity that demonstrates how a this type of Neural Network can be used to analyze and recreate the area within specified shapes.
(further information at: http://skylab.org/~sam/archives/2004/07/neural_paint_1.php)