

Software Developer & Researcher

Proven software developer & researcher with 7 years experience. Known for ability to meet deadlines, learn skills as required to solve problems, and effectively communicate with both technical and non-technical stakeholders. Strong technical skills and experienced project supervisor.

Highlights

C • Java • Python • OpenCL • TCP/IP/UDP • sockets • pthreads • multithreading • git/svn • API Design • Performance and Scalability • JVM • event-based simulator • restAPI • tensorflow • SQL

Experience

National Institute for Informatics

TOKYO, JAPAN

JSPS Fellowship: Formal Methods & Machine Learning for Load Balancing

Dec 2016 - Present

- Investigating the application of machine learning to heterogenous hardware task scheduling.
- Leading an international application of safety models to insecure distributed applications.
- Presentation and discussion at international of ideas.
- Administration of budget.
- Planning and overseeing agenda of work.
- Supervised work on the application of machine learning to GPU programming.
- Using C, Java, OpenCL, libSVM, weka, LLVM, session types, scribble.

Queen's University Belfast

BELFAST, U.K.

Research Fellow & Work Package Leader: Language & Runtime for ExoScale HPC

2016

- Design & developed programming model and runtime for next generation High Performance Computing platform.
- Generated technical documents for international distribution.
- Delivered presentations internally, and to international collaborators and European Union Officials.
- Travelled internationally for design and technical meetings.
- Led small team to deliver the technical goals.
- Used C (pthreads, sockets), Java, Python (numpy), OpenCL, and some LLVM on linux, libSVM, valgrind, wirehark, tcpdump, latex, and office suite.

Education Scotland

GLASGOW, U.K.

Education Consultant: Nationwide Curriculum Development

Autumn 2015

- Design and development of Scotland-wide computing science school curriculum (4 - 14).
- Generated a progression framework around 3 core areas of computing science.
- Developed and documented multiple example exercises to describe core concepts across different ages and stages of progression.
- Coordinated and debated with teachers, government, and academia to refine teaching methodologies.
- Consultation with industry on appropriate core concepts.

Japanese Society for the Promotion of Science (JSPS)

AIZUWAKAMATSU, JAPAN

Research Fellowship: GPU Parallisation of Weather Simulator in OpenCL

Summer 2013

- Optimisation and extension of a weather simulator with radioactive decay.
- Interdisciplinary collaboration with climate scientists.
- Testing to ensure consistency using statistical comparison of new and existing simulator.
- Documentation and presentation of successful performance improvement at conference.
- Used C++, OpenCL (AMD & NVIDIA GPU, multicore NUMA), OpenMP, python, linux, netCDF.

European Centre for Nuclear Research (CERN)

GENEVA, SWITZERLAND

Research Intern: Global, Distributed Resource Monitoring for the Grid

Summer 2010

- Address scalability issues with globally distributed data processing system.
- Developed and tested on live production service.
- Saw improvement of 2 orders of magnitude.
- Generated publication for the international Journal of Physics.
- Used Python (numpy, scipy), LDAP data format, TCP/IP (sockets).

Codeplay

EDINBURGH, U.K.

Compiler Developer: Compiler Tools, and Debugging for CELL Processor

Summer 2008

- Porting of runtime memory analysis to IBM Cell processor.
 - Development of a number of quality of life tools: e.g. name mangler and a code duplication checker.
 - Data analysis and interpretation, as well as presentation at weekly team meetings.
 - Used C++ with STL, and boost.
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Education

University of Glasgow : PhD in Computer Science

GLASGOW, U.K. 2011 – 2015

University of Glasgow : MSci (hons) in Computer Science – First Class

GLASGOW, U.K. 2005 – 2010

Projects

Custom Embedded Operating System

- Design, implementation, testing, and documentation of operating system for T-Mote sky, with MSP430 16-bit processor.
- Driver and interrupt handlers, network library, memory management, pre-emptive threading, storage access, and programming interface.
- Written in C and MSP430 assembler using memory mapped IO, DMA and I2C interface.

Custom Java Machine

- Design, implementation, testing, and documentation of a cross-platform virtual machine, instruction set, and class file format.
- Written in C for Linux, Contiki, Xen, OpenCL and RTOS and using sockets(TCP/IP, UDP, IPMulticast).

Xen-based WSN Simulation

- Design, implementation, testing, and documentation of simulator for wireless sensor networks & Xen.
- Detailed performance, memory consumption, and network traffic analysis.
- Currently being used for teaching support at the University of Oregon.
- Written in C/C++, Java, Python, combining Xen, TinyOS, and Contiki. Used wireshark and tcpdump.

Distributed, Parallel, and Adaptable Programming Language

- Design, implementation, testing, and documentation of new programming language and compiler.
- Extensive testing to show correctness.
- Creation of type-checker to enforce language rules.
- Was used in a IoT deployment in Glasgow, U.K.
- Using bison, Flex, C, Java.

Machine Learning for Auto Image Identification

- Design, implementation, testing, and documentation of webcrawler and Tensorflow image analysis tool.
- Interdisciplinary collaboration with linguist.
- Presentation of tool to linguists and computer scientists.
- Using Java (JSOUP), Python (numpy, tensorflow, PIL, matplotlib), docker.

Airline Mileage Webapp (ongoing)

- Creation of a website to find cheapest flight routes for maximum miles/points.
 - Scraped websites, normalised data, populated and queried database via a website, used Skyscanner restAPI for pricing information.
 - Using Java (GSON, apache, JSON, JSOUP, JDBC), HTML, PHP, SQL, POSTGRESQL, Javascript, restAPI.
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Skills

Programming Languages: C, Java, OpenCL, Bash, Python, MSP430 Assembler, SQL, PHP, HTML, javascript, CUDA, openMP, openACC

Operating Systems: Linux, Windows, Contiki, TinyOS, RTOS, Xen

Frameworks/Tools/Libraries: wireshark, tcpdump, valgrind, gdb, numpy, scipy, sockets (TCP/IP, UDP, IP-Multicast), pthreads, bluez, Netbeans, git, svn, tensorflow, office suite, JDBC, cgroups, restAPIs, JSOUP, GSON, apache, docker, oracle, postgresql, matlab, libSVM, CUDA, openACC, openMP

Natural languages: English (*native speaker*), Japanese (*post-beginner proficiency*), Thai (*beginner*)

Research

A full academic C.V., describing publications, teaching, and student projects, is available at www.paul-harvey.org