

Randall Schulz

Software Engineer

H&S Information Systems <http://hsinfosystems.com>

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Selected Languages and Software Technologies

C (2+ decades); C++ (1+ decades); Java (8 years); Groovy and Grails; Hibernate; Lisp, Prolog; Scala; Process Specification Language (PSL); J2EE: Servlets, JSP, Custom Tag Libraries, JavaBeans, Web Applications, Swing; XML; MySQL; YACC / Bison and Lex / Flex; JavaCC; ANTLR; UNIX / Linux Shells; Perl; CORBA (using C++ and Java) CLISP; XSB Prolog

Development Systems

Sun JDK, versions 1.1.x through 1.6; IntelliJ / JetBrains IDEA; jEdit; Cygwin (POSIX emulation for Windows); Microsoft Visual Studio

Operating Systems and Platforms

Linux; UNIX kernel, driver, systems and application programming ;v6, v7, 32v, BSD, Locus / AIX-TCO, System III, System V r2 and r3, Linux, Solaris; Streams / TLI; Macintosh OS, OS X; Windows NT, 2000, XP

Application Areas

Mathematical logic; logic programming and knowledge-based systems; networking: distributed, client/server computing and service-oriented architectures (SOA); geographical information systems (GIS); programming language design and compiler construction; image processing.

Other Expertise

Object-Oriented Analysis and Design; UML; Extensible and Framework-based software design; Programming language principles; OS design and implementation; Typography, 4-color process printing; color scanners; color theory.

Work History

H&S Information Systems (Mountain View, CA and Guerneville, CA) 11/2001 to present • Principal / Partner with Jay Halcomb

- Designed and implemented the Tau Logic Processor and Extensible Knowledge Base Management System. Tau includes a highly configurable theorem prover and a disjunctive logic programming solver for full first-order logic with identity and a scalable repository for ontologies expressed in first-order logic. Tau implements the ISO Common Logic standard, a successor to KIF. Tau is an open framework for the exploration and implementation of multiple logics and theorem-proving techniques. Tau is written entirely in the Java programming language and includes command-line and Web-based user interfaces as well as a Java API for embedding.
- Developed high-level software tools to support and facilitate industrial process engineering using PSL and Tau
- Built authoring tools and provided editorial support for the creation of Stanford Professor Stephen H. Schneiders comprehensive Web site on Global Warming and Climate Change.

A9.com (a division of Amazon.Com, Palo Alto, CA) 4/2005 to 10/2006 • Software engineer on 9-person team developing the A9.coms Yellow Pages local business listings with BlockView, a street-level image catalog. Work included management of very large business-listing databases, data cleansing, integration of listing data from multiple sources and approximate name matching.

- Software engineer on 5-person team developing A9.coms street map Web site.
- Invented and implemented novel algorithms for aligning GPS vehicle tracks to digital maps.
- Designed and developed SOA Web application development framework.

CRESST / UCLA (Los Angeles, CA) 5/2004 to 9/2004 • Co-designer and programmer of CAAS, the CRESST Automated Assessment System. CAAS is an ontology-based toolset for the assisted creation and automated delivery of complex tests, or assessments. CAAS is implemented in Java and incorporates the Protg Ontology Editor and Knowledge Acquisition System.

Teknowledge, Inc. (Palo Alto, CA) 7/97 to 5/2001 • Devised and implemented a technique, version safety, for ensuring interface version consistency in CORBA client-server systems in the face of evolving IDL interface specifications.

- Designed and implemented tools, patterns and templates for large-scale CORBA-based systems for the DARPA Next-Generation Information Infrastructure (NGII) project.
- Maintained and extended Java GUI for a pseudo-natural-language front-end to a Cyc-based (Cycorp) question-answering system developed for the DARPA High-Performance Knowledge Bases (HPKB) project.
- Developed Cyc knowledge base content for the 2nd year of the HPKB project.
- Designed a collaboration repository for the DARPA Rapid Knowledge Formation (RKF) project: a front-end for CVS allowing multiple workers to interact in a coordinated and managed fashion on knowledge-based and other programming projects.
- Designed and implemented large-scale knowledge-base repository, compiler and web-based front-end interface for a new knowledge-based programming system.
- Implemented a network server for XSB Prolog (XSB home / XSB SourceForge project).

PixelCraft, Inc. (a Xerox company) (San Leandro, CA) 5/93 to 11/96 • Designed and implemented extensible, embeddable software framework for image processing used in color management, image acquisition, image adjustment, press or printer conversions and corrections and other image processing applications. The C++ framework integrates native OS services and can be extended with new color spaces, image storage formats, image data formats and image processing operations.

- Extended and maintained ColorAccess, a Macintosh application to scan, correct and convert RGB raster images for four-color printing. Implemented PhotoShop host functionality enabling Photoshop Acquire and Image Format plug-ins to operate under ColorAccess. Implemented support for Photoshop 2.5 format files.
- Maintained and extended QuickScan, a SCSI scanner driver for pre-press image acquisition, to support new PixelCraft and 3rd-party scanners and to add new functionality and new UI elements.

Adobe Systems Incorporated (Mountain View) 3/91 to 9/92 • Member of 4-5 person team enhancing Adobe Illustrator for the Macintosh. Extended text handling to include support for tab stops: Added ruler UI element to control tabs and other text formatting attributes using direct manipulation; Extended text formatting algorithms to support tabs, including MS Word format import support. Added greeked text display to improve display speed. and support for

floating windows and dialog boxes. Modified various internal sub-systems to increase generality and improve performance.

Philips Interactive Media (Los Angeles) 4/90 to 1/91 • Designed and implemented digital image processor for use in Compact Disc-Interactive (CDI) authoring. Analyzed requirements; Designed processor architecture; Wrote detailed internal and external functional and API specifications; Designed, specified and implemented low-level C++ programming support library; Implemented entire system in C++; Designed Macintosh human interface for an interactive and batch image processor; Implemented human interface in C++ using MacApp version 2.

[Philips Interactive Media was spun off from American Interactive Media (a subsidiary of Polydor) to divide their responsibilities. AIM was the studio (producing CD-I titles) and PIM did authoring tools for the studio]

American Interactive Media (Los Angeles) 10/88 to 4/90 • Designed authoring language for describing content, usage and layout of 650 megabyte CD-I optical discs. Wrote language lexical and syntax specifications. Implemented YACC-based parser, hand-written scanner and symbol table comprising compilers front end.

- Designed, implemented and documented first Macintosh-based system for CD-I authoring based on AIM/PIM and 3rd-party hardware and software products.

Locus Computing Corp. (Los Angeles) 9/83 to 4/88 • Member of 10-20 person team designing and building the Locus (AIX) transparent, distributed UNIX system. Designed and implemented protocols supporting networks of mixed processors with process migration and remote program execution on a local-area network. Designed and implemented transparent remote terminal (tty) access and network-wide UNIX signals. Added compatibility with AT&T System V Release 2 APIs, libraries, file formats, commands and object files.

- Member of 2-5 person team building PC-Interface (PCI), a network-transparent file, print and remote execution service for IBM PC clients and UNIX servers. Designed and implemented the protocols and servers used by PCI clients to locate and connect to hosts. Ported the server to various UNIX hosts.

- Chief architect/designer and technical leader supervising team of 6-8 programmers building a UNIX-based extended MS-NET (Microsoft Network) file, print, remote execution and device server for AT&T's STARLAN Network. Designed and implemented extensions to the MS-NET protocol permitting UNIX-specific file operations, remote process execution and customized access to UNIX device files. Principal interface with customer, documentation, QA and marketing on all technical matters.

- Chief designer and technical lead supervising team of 4-5 programmers porting UNIX System V Rel. 3 streams sub-system and networking drivers to the AT&T 6300+ version of UNIX System V Rel. 2 (SVR2).

- Extended Locus / AT&T STARLAN server to generalize the product for a wider base of UNIX hosts. Designed a more generic and extensible administration protocol to replace the AT&T protocol. Adapted UNIX streams software for use under MS-DOS.

- Ported Locus STARLAN server to Philips proprietary, non-TLI UNIX networking API. Worked on-site in Apeldorn Netherlands under contract to Locus Computing.

Quotron Systems Inc. (Los Angeles) 7/82 to 8/83 • Designed and implemented office automation software; multi-window VDT multiplexing system; screen definition/layout language for application development; word processing software for UNIX System III.

Education

University of Wisconsin (Madison) 9/76 to 6/82

Major: Computer Sciences

Concentration: Operating System Design, Systems Programming

Grade average: 3.5 of 4

Publications

J. Halcomb and R.R. Schulz. Tau: A web-deployed hybrid prover for first-order logic with identity, with optional inductive proof. *12th international conference, LPAR 2005: Proceedings*, 2005.

Pat Hanrahan, Randy Schulz and Leonard Uhr, A Primer on Image Manipulation Using a High Resolution Color Display Terminal, *Univ. of Wisconsin Computer Science Tech Reports, Tech Report TR476*, 1982.

Other Affiliations

- Common Logic Standard: as ISO effort towards an international standard for Common Logic, now in Final Draft. This project was assigned to WG2 (Metadata) under SC32 (Data Interchange) of ISO/IEC JTC1. In October 2003, Harry Delugach (delugach@cs.uah.edu) was designated the editor for the standard. Other participants: Jay Halcomb, Patrick Hayes, Chris Menzel, Randall Schulz, John Sowa, and others.

- Association for Computing Machinery, Member

- IEEE Member (including the Computer Society), Member

1st North American Summer School in Logic, Language, and Information (NASSLLI 02), with the 11th Logic, Language, and Computation Colloquium Stanford, CA, June 24-30, 2002

- **IEEE Standard Upper Ontology (SUO) Working Group**,

- **Foundations of Mathematics list-serv**

- **Ontolog community** - ontology, ontological engineering and semantic technology

1st North American Summer School in Logic, Language, and Information (NASSLLI 02), with the 11th Logic, Language, and Computation Colloquium Stanford, CA, June 24-30, 2002