

Jay R. Halcomb

Logician and Computer Programmer

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Introduction

Jay Halcomb is a logician, writer, teacher, environmentalist, and computer consultant specializing in web site construction, scientific programming, and logic programming – a philosopher of language and logic concerned with the relations between predicate logic, philosophy of language, mathematics, and computer applications. In this regard, he is an active and unrepentant advocate of logical methodology in science and computer programming and has worked for a number of years on tasks which, at a high level of sophistication, involve the study of such topics. These tasks have included the development of applications for automated theorem proving, natural language processing, and the construction of knowledge bases. He is (with Randall Schulz, H&S Information Systems) constructing an online theorem prover for educational applications: the Tau logic system, a FOL theorem prover (with HOL extensions) which treats relations, functions and identity.

He is active in contributing to research seminars in logic and computation. He is a member of the American Philosophical Association, the American Mathematical Society, the Association for Computing Machinery, and the Association for Symbolic Logic; he is a participant in the **IEEE Standard Upper Ontology (SUO) Working Group**, the **Common Logic project**, an international standards effort, and the **Foundations of Mathematics list-serv**. He is also a member of the **American Philosophical Association's Committee on Philosophy and Computers**, and of the **Ontolog community** - ontology, ontological engineering and semantic technology.

Computer related employment

(Employment as logician, programmer, analyst, technical writer/editor, web-site producer, and consultant.)

He has over 20 years of cumulative experience in the writing, analyzing and testing of computer programs and systems. He has worked on machines from mainframes and minis to PCs, ranging from the IBM 360, Hewlett-Packard 3000 (MPE), DEC Vax and PDP-11's (Primos, Dec JCL), to IBM PCs and Macs, and have worked within many OS environments including Unix, Cygwin, and Sun Solaris, Mac OS 9 and X, and Windows 2000 NT Pro and XP. He has programmed in languages including: (markup and web) HTML, DHTML, XML; (server- and client-side scripting), PHP, LAMP and WAMP, Javascript, MySQL, Ruby with Rails, CGI, Java, Perl, JSP, and Apache server; (scientific and data analysis) Basic, Fortran; (logic programming, AI and expert systems) Lisp, Prolog, KIF, DAML, and RDF; (database) Cobol, mySQL, and DBase; and (assembly) 68000/ 8080/ 8085/ 8086/ 6502/ Z80 assembly. He has done numerical analysis, scientific, and database programming, and document production and editing, including layout and graphic design (LaTeX).

Applications he has written include: web sites, communication satellite utilities, word-processing, operating system utilities and scripts (for a statistical system), database design and construction, graphics, educational, numerical analysis (including statistics), formal language design, expert systems and AI, and financial programming. He has both designed and authored the content of various web pages, by both hand-coding and using DreamWeaver and other HTML editors.

2002 - present. Partner, H&S Information Systems

- The **Tau Knowledge Base and Extensible Theorem Prover**

- **An overview of Tau**, paper for the CADE-20 Workshop on Empirically Successful Classical Automated Reasoning (ESCAR), held 22nd-23rd July, 2005 at the 20th International Conference on Automated Deduction (CADE) Tallinn, Estonia, 22nd July - 26th July, 2005 (Abstracts)
- Slides for ESCAR (Full version, PDF)
- ESCoR-JAL 2007 program committee
- The FLoC'06 Workshop on Empirically Successful Computerized Reasoning (ES-CoR), held 21st August 2006, as part of the The 3rd International Joint Conference on Automated Reasoning at The 2006 Federated Logic Conference, Seattle, USA, 10th - 22nd August, 2006

- Sonoma & Mendocino Counties, American Red Cross (Website)
- Edison Innovations, LLC (Consulting: PHP, MySQL)
- Wood Pontiac, Cadillac, Mazda (Consulting, commercial website: PHP, MySQL)
- Professor Stephen H. Schneider, Stanford University (Climatology) (website)
- Professor Shripad Tuljapurkar, Stanford University (Population Studies) (website)
- Professor Terry L. Root, Stanford University (Ecology) (website)
- Professor Emeritus Robert A. Helliwell, Dept. of Electrical Engineering, Stanford University (Work in progress - LaTeX)
- Morrison Institute for Population and Resource Studies, Stanford University (website)
- The CAR Project (Computer Assisted Reasoning (consulting))
- The National Center for Research on Evaluation, Standards, and Student Testing (UCSL - consulting)
- Russian River Residents Against Unsafe Logging (RRRAUL - environmental NGO) (website)
- Russian River Watershed Protection Committee (RRWPC - environmental NGO) (website)
- Prismatic Instant Sign Center (commercial website: menu system, file uploader, Javascript, PERL, CGI)
- Potala Rug House (commercial website)
- Sierra Club, Redwood Chapter (pro bono assistance)

2000-2001: Senior Knowledge Engineer, Teknowledge Corporation, 1810 Embarcadero Road, Palo Alto, CA 94303. Phone: 650-424-0500. Expert systems and AI applications, Prolog and CycL. Projects: FASIT (Fast Analyst Support Inference Tool), Sigma (a web-based environment for ontology development and knowledge engineering). His employment at Teknowledge involved logic programming in Prolog (SWI and XSB). This included designing and implementing the Sigma Knowledge System, defining the KIF language used, axiomatization, designing the FOL inference engine, and composing test suites. He also worked on various DAML-S projects.

1990-1999: Freelance computer consulting in the S.F. Bay area Work for nonprofit organizations (webpages), businesses (database programming) and individuals.

1987-1988: Interactive Concepts, 40 N. Swan, Suite 207, Tucson, AZ 85718. (A communications systems design firm). Programmer/mathematician.

1983-1985: Aridlands Watershed Management, U.S.D.A., 2000 E. Allen Rd., Tucson, AZ 85718. Programmer: statistical programming (e.g., wrote multivariate nonlinear least squares regression program); co-wrote user's manual and other documentation for technical and non-technical users of a (graphic) statistical analysis system; Fortran, PDP 11 and Vax.

1981-1982: Personal Computer Instruction, Tucson, AZ. As a contractor, instructed individuals, businesses in personal computer use, and wrote course and promotional materials.

1979: Computing Services, Santa Rosa Junior College, Santa Rosa, CA 91405. Programmer/analyst: financial and student records database; responsible for program documentation and the user's guide; Cobol, HP 3000.

1976-1978: Philosophy Dept., Sonoma State University, Rohnert Park, CA 91428. Programmer: developed various educational logic programs for Phil. Dept., under grant funding (authored grant); wrote course materials and a user's manual; Basic, PDP-8 and 10.

Writing

Types of published writing: academic, technical (user's guides, program documentation, magazine articles); fiction; poetry; essays; environmental journalism (newspaper articles, editorials, press releases, materials on Sierra Club and RRAUL web sites); course materials, promotional and advertising copy. Editing of academic and commercial websites.

- Halcomb, J. and Schulz, R. (2005): "Tau: A Web-Deployed Hybrid Prover for First-Order Logic with Identity, with Optional Inductive Proof", CADE-20 Workshop on Empirically Successful Classical Automated Reasoning (ESCAR), held 22nd-23rd July, 2005 at the 20th International Conference on Automated Deduction (CADE) Tallinn, Estonia.
- An overview of Tau, paper for the CADE-20 Workshop on Empirically Successful Classical Automated Reasoning (ESCAR), held 22nd-23rd July, 2005 at the 20th International Conference on Automated Deduction (CADE) Tallinn, Estonia, 22nd July - 26th July, 2005 (Abstracts)
- Slides for ESCAR (Full version, PDF)
- Halcomb, J. and Pease, A., (2001), "On Treating Negation within XSB" (and upon extending XSB programming with a form of logical negation, and its relations to existing varieties of logic programming), AAAI Spring Symposium 2001 Workshop on Answer Set Programming, Stanford University.
- "The Automation of Human Reasoning" - book review, Dr. Dobbs Journal, February 1984.
- "Twenty-nine Basics Compared" - language review, Computer Language, May 1985.
- "Model 100 DATA/SORT" - Tandy Model 100 database product review, PCM, August 1985.
- "A SCHEDL enhancement" - Basic program for Tandy Model 100, PCM (Personal Computer Monthly, July 1985.
- 1985-6: Technical referee, Computer Language Magazine, 4390 Bodega Ave., Petaluma, CA 94952.

Education

He all but completed his dissertation for the Ph.D. in Philosophy at the University of Arizona. (In 1990, he passed the Preliminary Examinations for the Ph.D.) Other education includes: M.A., Philosophy, University of Arizona, 1987. B.A., Philosophy (w/ Distinction), Sonoma State University, 1978.

In Philosophy, his major areas of study are: mathematical logic, theoretical linguistics, philosophy of logic, philosophy of language, computer science (AI and cognitive science), the philosophy and foundations of mathematics, and epistemology. At Arizona his minor was Mathematics. (22 graduate units in Set Theory, Topology, Abstract Algebra, and Advanced Analysis).

He has 5 years of experience teaching logic at the University level, at the University of Arizona and at Sonoma State University. His teaching included the courses: Introduction to Logic, Advanced Logic, and Philosophy of Logic.

- M.A., Philosophy, University of Arizona, 1987. (79 sem. units; GPA 3.7)
- B.A., Philosophy (w/ Distinction), Sonoma State University, 1978. (89 sem. units; GPA: 3.94)
 - Dissertation: Formal Semantics of Hypothetical Reasoning (Topological and Algebraic Interpretations of Subjunctive Conditionals), University of Arizona, 1990, unpublished, 120 pp.
 - Masters: Deontic Logic, University of Arizona, 1987, unpublished, 45 pp.

- Honors: Montague Grammars, SSU, 1978, unpublished, 67 pp.

Teaching

- Introduction to Logic, University of Arizona, F '80, F '81, F '82, F '83, S '84.
- Introduction to Moral and Social Philosophy, U. of A., S '82.
- Introduction to Philosophy, Arizona Department of Corrections, Wilmot Road Correctional Facility (Tucson, AZ) F '83.
- Advanced Logic, Sonoma State University, F,S '77.
- Philosophy of Logic, SSU, F,S '78.
- Also co-taught various other introductory Philosophy classes: University of Arizona, 1980-7, and Sonoma State University, 1978-9, and organized and supervised Computer Instructed Logic Course, SSU, 1977-8).

Conferences and Seminars

- Member, Program Committee, the FLoC'06 Workshop on Empirically Successful Computerized Reasoning (ESCoR), 21st August 2006, part of the 3rd International Joint Conference on Automated Reasoning, at Seattle, USA, 10th - 22nd August, 2006
- Presentation, Stanford Mathematical Logic Seminars, Axiomatizing Einstein's Mice; Slides, Nov. 8, 2005
- Sierra Club, Chapter Leader Training, March 15-19, 2006, Marconi Conference Center, Marshall CA
- Stanford Mathematical Logic Seminars, Axiomatizing Einstein's Mice; Slides, Nov. 8, 2005
- Sierra Club's National Convention and Expo, September 8-11, 2005 The Moscone Center, San Francisco
- Empirically Successful Automated Reasoners (ESCAR), CADE-20, 20th International Conference on Automated Deduction, Tallinn, Estonia, 22 July - 27 July, 2005
- Whole Earth Systems: Science, Technology and Policy Symposium, Stanford University, 2/10/2005 - 2/12/2005,
- Geographical Domain and Geographical Information Systems: EuroConference on the Ontology and Epistemology for Spatial Data Standards, La Londe les Maures, France, 22 - 27 September, 2000.
- Answer Set Programming: Towards Efficient and Scalable Knowledge Representation and Reasoning, 2001 AAAI Spring Symposium, Stanford, CA, March 26-28, 2001.
- 1st North American Summer School in Logic, Language, and Information with the 11th Logic, Language, and Computation Colloquium - NASSLLI '02, Stanford, CA, June 24-30, 2002.

Memberships

Association for Automated Reasoning; American Philosophical Association; American Mathematical Society; Association for Computing Machinery; Association for Symbolic Logic; Redwood Chapter, Sierra Club; Russian River Residents Against Unsafe Logging (founder), IEEE Standard Upper Ontology (SUO) Working Group, Foundations of Mathematics list-serv, Ontolog list-serv, Common Logic list-serv.

Honors, awards, grants, scholarships

Teaching assistantships, University of Arizona, 1980-7. Tuition and fees scholarships, U. of A., 1980-7. Danforth and Fulbright Nominee, Sonoma State University, 1977. Programming grant (logic instruction), SSU, 1977. Dean's Honor List, SSU, 1977-8. Graduation with Distinction, SSU, 1978.