Jeffrey D. Oldham

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Education

Ph.D. in Computer Science (1992–99)
Stanford University.
Ph.D., August 1999. Worked on experimental and theoretical analysis of network flow algorithms. Advisor: Serge Plotkin. National Science Foundation Graduate Student Fellow. Thesis title: *Multicommodity and Generalized Flow Algorithms: Theory and Practice.* Multicommodity flow problems involve simultaneously shipping multiple commodities through a single network so the total (multi)flow obeys arc capacity constraints. Theoretical work yielded combinatorial approximation algorithms for the no-cost and the minimum-cost problem variants with provably small running times and space requirements. Unfortunately, a direct implementation of the theories is not fast. I designed and evaluated algorithms which are experimentally fast while maintaining the same asymptotic complexity. These implementations are several orders of magnitude faster than commercial linear programming solvers.

Generalized flow problems generalize ordinary network flow problems by adding a flow multiplier to each arc. Because these problems can have full rank, these generalized network flow problems have appeared more difficult to solve than ordinary network flow problems. I showed how to combine parametric search and the Bellman-Ford shortest path framework to solve a generalized shortest path problem. Using this algorithm as a subroutine, I presented combinatorial, fully polynomial-time approximation schemes for all generalized flow problems (with nonnegative costs).

M.S. in Computer Science (1992–96)
Stanford University.

B.A. in Computer Science (1987–91)
Massachusetts Institute of Technology and Rice University.
Graduated summa cum laude. National Merit Scholar. Tau Beta Pi.

Work Experience

Senior Software Engineer (June 2000–)
CodeSourcery, LLC. http://www.codesourcery.com/. Designed, specified, and implemented the VSIPL++ toolkit. This C++ toolkit supports solving vector, signal, and image processing problems in both serial and distributed environments using intuitive, algorithmic syntax. Wrote 250+ page specification incorporating the best current software research. Made quarterly presentations to achieve consensus on design decisions, educate how to use the toolkit, and describe current status at the meetings of the the HPEC-SI Forum, which includes military contractors, academics, and industrial researchers. Work funded by the Department of Defense High Performance Embedded Computing Software Initiative administered through MIT Lincoln Laboratory (http://www.hpec-si.org/).
Completed USAF OSD SBIR "High Performance Object Oriented Software for Parallel Embedded Systems" to implement VSIPL++ extensions to support a $k - \omega$ beamformer application in a variety of execution models including use of SSE SIMD instructions and multiple processors. Phase 2 proposal submitted. U.S. Air Force / Office of the Secretary of Defense (OSD) Phase 1 SBIR 03-022 contract with value $98.7K. http://www.sbirsttr.net/-afsbir/Awards/Awards_profile.asp?ID=O03B036710&Area=Award%20Detail.
Implemented C++ ABI Testsuite testing compiler conformance to the Itanium C++ Application Binary Interface http://www.codesourcery.com/cxx-abi/ used by G++, Intel, and most other C++ compilers. Implemented using Python, C++, and the QMTest testing framework.
Wrote *Advanced Linux Programming* book. Developed POOMA scientific computation library, extending container abstractions. Specified and developed the QMTest test regression tool. G++ compiler development work, e.g., speeding template instantiation, memoizing dependences, and bug fixes. Wrote run-time C++ library. Optimized financial program, reducing execution time by a factor of ten. For patent law clients, performed software archaeology, checked for patent infringement, and tested operating systems' standards compliance.

Assistant Professor (August 1999–May 2000)
Trinity University Computer Science Dept, San Antonio. http://www.cs.trinity.edu/
Taught courses in introductory programming (two semesters), operating systems, and simulation. With 44 students, designed and implemented sales tax server prototype. With 12 students, developed models and simulated investment accumulation and contraction.

Visiting Assistant Professor (Spring 1999)
Dartmouth University
Taught second-level algorithms course (CS 45) emphasizing mathematical analysis, design principles, and an introduction to NP-completeness to upper-level undergraduate students.

Summer Employee (Summer 1998)
AT&T Labs, Florham Park, New Jersey. http://www.research.att.com/
The proposed HTTP 1.1 protocol permits persistent connections between servers and clients. To decide when persistent connections can reduce a server or client's load, we designed and experimentally evaluated policies to predict when to terminate persistent HTTP connections. We also developed a theoretical model for this distributed, multiple-player problem. Supervisor: Edith Cohen.

Teaching Assistant for Intensive C++ Course (Summer 1997)
Western Institute of Computer Science, Stanford University
Teaching assistant for intensive, one-week course teaching all aspects of C++ programming (introduction, data abstraction, inheritance, templates, generic programming, and applicators) to computer professionals. Held laboratory sessions, answered questions, and introduced students to the Stanford computer system. Instructors: Andy Koenig (AT&T Labs) and Barbara Moo (AT&T).

Instructor for Compiler Course (Summer 1996)
Stanford University
Taught upper-level undergraduate and masters level course (CS 143) about the principles and practices of designing programming language compilers. Led sections; wrote and graded exams, programming assignments, and homeworks; created course policies; held office hours; set grades. Lectures were given via videotape from a previous quarter. Course included students working at San Francisco area computer companies and participating via closed-circuit television.

Instructor for Programming Languages Course (Summer 1995)
Stanford University
Taught undergraduate senior and masters level course (CS 242) about the basic elements of programming languages and programming paradigms: functional, imperative, and object-oriented. Same instructor responsibilities as for the compilers course described above.

Teaching Assistant for Compiler Optimization Course (Winter 1995)
Stanford University
Led section for compiler optimization course (CS 243), appropriate for undergraduate seniors and masters level students. Also graded homework and programming assignments, and held office hours. Course included students working at San Francisco area companies and participating via closed-circuit television. Instructor: Professor Monica Lam.

Software Consultant (Summers 1992, 1993)
Transport Studies Unit, Oxford University. http://www.tsu.ox.ac.uk/
Corrected a large transportation modeling program. Wrote an interactive, stated preference survey concerning drivers' responses to road-congestion pricing. Facilitated the survey's administration. Purchased and installed software on a Sun UNIX computer. Adviser: John Polak (Imperial College).

Research Programmer (May 1991–May 1992)
CENTER FOR RESEARCH ON PARALLEL COMPUTATION, RICE UNIVERSITY. http://www.-crpc.rice.edu/
Added color graphics to the user interface of the ParaScope Editor, an interactive tool to find and exploit parallelism in sequential Fortran programs. Supervisors: Ken Kennedy and Scott Warren.

Teaching Assistant for Introductory Computer Science Math Course (Summer and Autumn 1991)
RICE UNIVERSITY
Held office hours to answer students' questions in this undergraduate introduction to the mathematics of computer science. Also graded exams and homeworks. Instructor: Professor Mark Krentel.

Teaching Assistant for Introductory Programming Course (Spring 1991)
RICE UNIVERSITY
Taught laboratory sessions for this introductory programming course, teaching the principles of program design, rules of program evaluation, and an introduction to programming language features. Held office hours, graded exams and homeworks. Instructor: Bruce Duba.

Mathematician (Summers 1989, 1990)
SHELL DEVELOPMENT COMPANY, BELLAIRE, TX.
Wrote a computer program to extract status information from the nodes of a hypercube computer. Attempted to export the X Windows System to the hypercube computer. Supervisor: Dave Tolle.

Tutor for Multivariate Calculus Course (Spring 1988)
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Tutored individual students on vector and multivariate calculus. Held office hours and graded exams and homeworks.

Software Development

VSIPL++ (2002–)
CODESOURCERY, LLC. Programmed open-source reference implementation for VSIPL++ toolkit. This C++ toolkit supports solving vector, signal, and image processing problems in serial environments with intuitive, algorithmic syntax. This work will be extended to support multi-processor execution. Work funded by the Department of Defense High Performance Embedded Computing Software Initiative administered through MIT Lincoln Laboratory.

C++ ABI Testsuite (2002–2003)
CODESOURCERY, LLC. Itanium C++ Application Binary Interface used by G++, Intel,

and most other C++ compilers. Commercially available from CodeSourcery. Implemented using Python, C++, and the QMTest testing framework.

POOMA C++ Toolkit (2001)
CodeSourcery, LLC. Revised the `Field` abstraction, simplifying and supporting multiple values per cell. Ported the library to recent compilers and operating systems. Wrote a user manual.

Generalized Shortest Paths Implementations (1998–99)
Stanford and Trinity Universities.
Implementations of several different generalized shortest path algorithms. These algorithms are a combination of geometric search and dynamic-programming implementations. We show that different Bellman-Ford-Moore-like implementations have asymptotically different running times and these running times differ from those for ordinary shortest path problems.

Multicommodity Flow Approximation Implementation (1995–97)
Stanford University.
The program solves the network flow optimization problems of minimum-cost and no-cost multicommodity flows. The problems involve allocating shared resources among flows between different locations. Given a graph, an arc capacity function, a set of commodities (a source node, a destination node, and a demand), and an arc cost function, determine the cheapest way to route each commodity's flow so the total flow (of all the commodities) on any arc is at most its capacity.

DNA Sequence Alignment Program (Spring 1995)
Stanford University.
Given two character sequences, e.g., DNA bases, introduce gaps into the sequences so as many characters match as possible. Sequence alignment is used frequently to identify and match gene sequences. This dynamic programming implementation has been used in Stanford University's MIS 214/CS 274 course since 1995.

ParaScope Editor (May 1991–May 1992)
Rice University.
Added color graphics to the ParaScope Editor research tool, an interactive tool to find and exploit parallelism in sequential Fortran programs.

Publications

Multicommodity and Generalized Flows: Theory and Practice by Jeffrey D. Oldham. Ph.D. Thesis.

VSIPL++ Specification by Jeffrey D. Oldham and Mark Mitchell. The VSIPL++ Library is a C++, object-oriented, template-based library for vector, signal, and image processing. The library supports both serial execution similar to the VSIP Library but also supports single-program, multiple-data distributed computation without the need for explicit parallel communication code. The 250-page serial specification is nearing adoption, while the parallel specification's version number is 0.5. Developed in conjunction with MIT Lincoln Laboratory's High Performance Embedded Computing Software Initiative (HPEC-SI) http://www.hpec-si.org/.

Advanced Linux Programming by Mark Mitchell, Jeffrey Oldham, and Alex Samuel, New Riders, 2001, ISBN 0-7357-1043-0. This book uses a tutorial approach to teach C programmers how to write applications using the GNU/Linux operating system. http://www.advancedlinuxprogramming.com/.

Advanced Software Technology in VSIPL++ by Edward Rutledge, Jeffrey Oldham, and Glenn Schrader. Department of Defense (DoD) High Performance Computing Modernization Program (HPCMP) Users Group Conference 2004 (UGC2004), Williamsburg, VA, 2004 Jun 07–11. Present VSIPL++ and its expression-template technology and parallel programming model. http://www.hpcmo.hpc.mil/Htdocs/UGC/UGC04/.

VSIPL++: Parallel Performance by Mark Mitchell, Jeffrey D. Oldham, and Nathan Sidwell. Submitted to the *Eighth Annual High Performance Embedded Computing Workshop*, 28–30 Sep. 2004, MIT Lincoln Laboratory, Lexington, MA. http://www.ll.mit.edu/hpec/.

VSIPL++ Serial and Parallel Performance by Mark Mitchell, Jeffrey D. Oldham, and Nathan Sidwell. *Seventh Annual High Performance Embedded Computing Workshop*, Sep. 2003, MIT Lincoln Laboratory, Lexington, MA. Experimental results comparing the C++ VSIPL++ and C VSIPL libraries. Introduction to the parallel VSIPL++ programming model. Distribution limited to workshop attendees only. http://www.ll.mit.edu/hpec/.

Scientific Computing Using POOMA by Jeffrey D. Oldham. *C/C++ Users Journal*, 2002 Nov. Gentle introduction to the POOMA parallel scientific programming toolkit. Present a C++ program using POOMA to model the two-dimensional neutron diffusion process inside an atomic bomb. http://www.cuj.com/documents/s=8007/cuj0211oldham/oldham.htm.

VSIPL++: Intuitive Programming Using C++ Templates by Mark Mitchell and Jeffrey D. Oldham. *Sixth Annual High Performance Embedded Computing Workshop*, 24–26 Sep. 2002, MIT Lincoln Laboratory, Lexington, MA. Introduction to the VSIPL++ application-programmer interface, supporting data-parallel programming, array-like data structures separating functionality from implementation, and single-program, multiple-data parallel programming. Distribution limited to workshop attendees only. http://www.ll.mit.edu/hpec/.

POOMA: A C++ Toolkit for High-Performance Parallel Scientific Computing by Jeffrey D. Oldham. User manual for the open-source POOMA C++ toolkit for parallel scientific computation. Users include nuclear weapon physicists at Los Alamos National Laboratory. http://www.codesourcery.com/public/pooma/manual.pdf.

QMTest: A Software Testing Tool by Mark Mitchell and Jeffrey D. Oldham. Presented at the 2002 Tenth International Python Conference. QMTest We present an open-source, general-purpose, cross-platform software testing tool suitable for testing a wide variety of software, e.g., compilers, databases, graphical user interfaces, or embedded systems.

An Implementation of a Combinatorial Approximation Algorithm for Minimum-Cost Multicommodity Flows by Andrew Goldberg, Jeffrey D. Oldham, Serge Plotkin, and Cliff Stein. A conference version of much of my thesis work. Published in proceedings of Integer Programming and Combinatorial Optimization 1998. Technical report version: STAN-CS-TR-97-1600, http://theory.stanford.edu/˜oldham/publications/MCMCF-TR/-MCMCF-TR.ps.

Combinatorial Approximation Algorithms for Generalized Flow Problems by Jeffrey D. Oldham. Invited paper for *Journal of Algorithms*, 38:1 (special issue of best SODA 1999 papers), Jan. 2001, pp. 135–169. Presented at Symposium on Discrete Algorithms (SODA) 1999. Presented a Bellman-Ford-based algorithm for the single-source generalized shortest paths problem, also called the restricted generalized uncapacitated transshipment problem. Using this algorithm as a subroutine, I presented combinatorial, fully polynomial-time approximation schemes for all generalized flow problems (with nonnegative costs). Also available as http://theory.stanford.edu/˜oldham/publications/generalized/sp.ps.

Parallel Algorithms for the All-Sources Generalized Shortest Paths Problem by Jeffrey D. Oldham and Vaughan Pratt. Poster at Eleventh ACM Symposium on Parallel Algorithms and Architectures Revue, 1999 Jun 29, Saint-Malo, France, http://www.cs.dartmouth.edu/SPAA/1999/revue.html. Using monotonic piecewise-linear functions and the Floyd-Warshall algorithm, we present a logarithmic-time PRAM algorithm for the all-sources generalized shortest paths problem. Available at http://theory.stanford.edu/˜oldham/publications/-generalized/asgsp.ps.

Accurate Approximations for Asian Options by Donald Aingworth, Rajeev Motwani, and Jeffrey D. Oldham. Presented at the Symposium on Discrete Algorithms (SODA) 2000. We presented an asymptotic fully-polynomial approximation scheme for pricing Asian options on a lattice. This is the first algorithm yielding guaranteed error bounds in polynomial time.

How to Beat Random Sampling Every Time by Donald Aingworth, Rajeev Motwani, and Jeffrey D. Oldham. We present an unbiased estimator with lower variance than regular random sampling when each random event's value and probability are known.

Means for Searching by Jeffrey D. Oldham. We generalize binary and generalized search by demonstrating a one-to-one relationship between search techniques, means, and continuous, strictly monotonic functions.

The Incremental Investment Problem: Determining Sustainable Withdrawal and Accumulation Rates by Jeffrey D. Oldham. We define the incremental investment problem is to determine the probability of reaching a specified financial goal through periodically adding or withdrawing from an investment, presenting a one-pass, matrix-based algorithm for use with historical data. We also extend to incorporate capital gains. In progress.

Managing TCP Connections Under Persistent HTTP by Edith Cohen, Haim Kaplan, and Jeffrey D. Oldham. *Computer Networks*, 31:11–16, 17 May 1999, pp. 1709–1723. Presented at The Eighth International World Wide Web Conference. Persistent HTTP connections, included in the draft HTTP/1.1 protocol, permit several HTTP request/response messages to be sent using the same TCP connection. We designed and experimentally evaluated policies to predict when to terminate persistent HTTP connections. Available at http://www8.org/w8-papers/5c-protocols/policies/policies.html.

Experiences Using the ParaScope Editor: An Interactive Parallel Programming Tool by Mary W. Hall, Timothy J. Harvey, Ken Kennedy, Nathaniel McIntosh, Kathryn S. McKinley, Jeffrey D. Oldham, Michael H. Paleczny, Gerald Roth. *Proceedings of the Fourth ACM SIGPLAN Symposium on Principles & Practice of Parallel Programming (PPOPP).* May 1993. pp. 33–43. Technical report version: CRPC-TR93297, Rice University, also available as http://softlib.rice.edu/pub/CRPC-TRs/reports/CRPC-TR93297.pdf.

Presentations

MCMCF: Computational Tool for Checking Whether a Network Can Support a Given Set of Requirements by Jeffrey D. Oldham. Presentation on multicommodity flow research. Workshop on Routing and Switching, Center for Telecommunications at Stanford. 1997 September 04. Slides available at http://theory.stanford.edu/~oldham/talks/-MCMCF-talk.ps.

MCMCF: A Tool for Network Design by Jeffrey D. Oldham. Presentation on multicommodity flow research. Center for Telecommunications at Stanford University 1997 Annual Research Review. 1997 November 18. Slides available at http://theory.stanford.edu/-~oldham/talks/MCMCF-talk-short.ps.

Pork Bellies and Orange Juice: An Introduction to Multicommodity Flows by Jeffrey D. Oldham. An informal introduction to multicommodity flows presented at AT&T Labs 1998 June. Some of the presentation used a whiteboard but some slides are available at http://theory.stanford.edu/~oldham/talks/MCMCF-talk.ps.

A Simpler Combinatorial Generalized Flow Algorithm by Jeffrey D. Oldham. Presentation at the Stanford Algorithms Seminar about a network-flow-based approach to solving generalized shortest paths problems, i.e., shortest paths problems with losses and gains. 1998 September 24.

Generalized + Shortest Paths = Binary Search + Bellman-Ford by Jeffrey D. Oldham. Presentation on a network-flow-based approach to solving generalized shortest paths problems, i.e., shortest paths problems with losses and gains. Presented at the Bonn

Workshop on Discrete Optimization, Institute for Discrete Mathematics, Bonn University, 1998 October 01. Slides available at http://theory.stanford.edu/~oldham/talks/Bonn98/gsp-Bonn.ps.

Parallel Algorithms for All-Sources Generalized Shortest Paths by Jeffrey D. Oldham. Presentation on using monotonic piecewise-linear functions and the Floyd-Warshall algorithm to yield a logarithmic-time PRAM algorithm for the all-sources generalized shortest paths problem. This joint work with Vaughan Pratt was presented at the 1999 ACM Symposium on Parallel Algorithms and Architectures Revue.

Implementing Generalized Shortest Paths Algorithms by Jeffrey D. Oldham. Presentation of the running times of various implementations of generalized shortest path algorithms described in my Ph.D. thesis. Presented at Informs 1999 November conference, 1999 November 07.

Parallel VSIPL Using VSIPL++ by Mark Mitchell and Jeffrey D. Oldham. Supercomputing 2002, Baltimore, MD, Nov. 2002.

VSIPL++: Intuitive Programming Using C++ Templates by Mark Mitchell and Jeffrey D. Oldham. GOMACTECH 2003, 04 Apr 2003, Tampa, FL. http://www.gomactech.net/2003/.

VSIPL++ Specification and Implementations by Jeffrey D. Oldham. Quarterly presentations at the HPEC-SI Forum meetings at MIT Lincoln Laboratory, Lexington, MA. Present serial and distributed VSIPL++ specification and implementation information, C++ expression template loop fusion technology, VSIPL++ I/O, VSIPL++ example programs, on 2002 Jun 12, 2002 Sep 27, 2002 Dec 11, 2003 Mar 12, 2003 Jun 25, 2003 Aug 27, 2003 Nov 12, 2004 Feb 25, and 2004 May 19–20. Joint work with Mark Mitchell and Nathan Sidwell. http://www.hpec-si.org/.

Literature Reviews

Computing Reviews article about "On the Existence of Equilibria in Noncooperative Optimal Flow Control," by Korilis and Lazar. Vol. 37, No. 7, Jul 1996. Review 9507-0515, pp. 362–363.
Computing Reviews article about "Graphs Generalizing Closed Curves with Linear Construction of the Hamiltonian Cycle," by Malgouyres. Vol. 37, No. 7, Jul 1996. Review 9507-0514, p. 362.

Computing Reviews article about *The Language of Machines*, by Beigel and Floyd. Vol. 37, No. 6, Jun 1996. Review 9606-0400, pp. 288–289.

Computing Reviews article about "Wait-free Consensus using Asynchronous Hardware," by Chor et al. Vol. 36, No. 7, Jul 1995. Review 9506-0491, pp. 366–367.

Computing Reviews article about "Tentative and Definite Distributed Computations: An

Optimistic Approach to Network Synchronization," by Garofalakis et al. Vol. 36, No. 6, Jun 1995. Review 9506-0400, pp. 308–309.

Computing Reviews article about "Some Results on Elusive Graph Properties," by Eberhard Triesch. Vol. 35, No. 12, Dec 1994, Review 9412-0894, p. 650.

Publication Work

Accuracy Checker, Exercise Answer Checker for *Calculus* by Johnston and Mathews. Corrected galleys of this textbook for beginning undergraduate and high school senior calculus courses. Marked mathematical, typographical, and formatting problems. Verified all exercise answers.

Reviewer for *Accelerated C++: Practical Programming by Example* by Andrew Koenig and Barbara E. Moo.
Reviewed chapters in this book teaching C++ to new programmers. With its emphasis on using libraries and the STL, this book radically changed the way C++ is taught and learned.

Technical Illustrator for *The Art of Computer Programming*, Volumes 1–3, Third Edition by Donald E. Knuth.
Produced over five hundred flowcharts, (computer science) trees, graphs, and other technical illustrations using the MetaPost computer language for this classic computer science series, essential for all computer scientists.

Accuracy Checker, Computer Algebra System Exercise Reviewer, Exercise Answer Checker for *Calculus and Analytical Geometry*, Ninth Edition, by Thomas and Finney.
Corrected galleys of this textbook for beginning undergraduate and high school senior calculus courses. Marked mathematical, typographical, and formatting problems. Reviewed and solved (using Mathematica) computer algebra system exercises. Verified exercise answers provided in the textbook.

Accuracy Checker for *Calculus for Engineers and Scientists*, Preliminary Edition, Volumes 1 and 2 by Giordano, Weir, and Finney.
Corrected galleys of some chapters of this textbook for an undergraduate engineering and science calculus courses. Marked mathematical, typographical, and formatting problems.

Accuracy Checker for *Calculus, Preliminary Edition* by Al Shenk.
Corrected galleys of some chapters of this proposed textbook for an undergraduate calculus course. Marked mathematical, typographical, and formatting problems.

Accuracy Checker for *Calculus: A Complete Course*, second edition by Ross L. Finney, Franklin D. Demana, Bert K. Waits, Daniel Kennedy.
Corrected galleys of this textbook for beginning undergraduate and high school senior calculus courses. Marked mathematical, typographical, and formatting problems.

Reviewer for *Programming in Standard C++: A New Approach* by Andrew Koenig and Barbara Moo.
Reviewed this proposed book teaching C++. Unlike most other C++ books which first assume the reader is fluent in the C programming language, this book immediately starts with C++ concepts including the Standard Template Library, polymorphism, and data abstraction. Also indicated typographical errors in the manuscript.

Manuscript Reviewer for *Software Solutions for The C++ Programming Language* by David Vandevoorde.
Reviewed this book of exercise solutions for Bjarne Stroustrup's *The C++ Programming Language*, Third Edition. Commented on the choice of exercises to solve, the text and style of the solutions, and the introductory material in this book appropriate for computer programmers. Indicated programming and typographical errors in the manuscript.

Manuscript Reviewer for *C++ Primer Answer Book* by C. Tondo and Bruce Leung.
Reviewed this book of solutions to the exercises in Lippman and Lajoie's *C++ Primer*, Third Edition. Commented on the text, style, and correctness of the solutions. Indicated programming and typographical errors in the manuscript.

Book Proposal Reviewer for proposed generic programming and frameworks book.
Commented on a proposed book about programming frameworks and generic programming. Given a table of contents and a sample chapter, commented on whether the book should be published and its importance, choice of topics, and possible audience.

Technical Consultant for *Computer Musings: The Associative Law* by Donald E. Knuth.
Chose captioning text added to a videotape of Stanford Professor Donald E. Knuth's lecture about binary trees. Part of University Video Communications's Distinguished Lecture Series, this tape is aimed at upper undergraduate, graduate, and professional computer scientists.

Leadership Positions

Algorithms Seminar and Theory Colloquium Coordinator (1993–95)

Stanford University. http://theory.stanford.edu/~aflb/colloq.html and http://theory.stanford.edu/~aflb/aflb.html
Invited speakers, advertised, and hosted a weekly algorithms seminar for the theory group of the Computer Science Department. Also, coordinated the monthly theory colloquium to bring the best theoretical computer scientists to speak at Stanford. Responsibilities included inviting speakers, advertising, hosting, establishing meetings between the speaker and faculty and students, and arranging accommodations and food logistics.

Graduate Resident Assistant (1993–97)
STANFORD UNIVERSITY.
Served as a resident assistant, for two years serving seventy-one foreign and American graduate students living in an on-campus graduate apartment complex, and for two years serving one hundred fifty graduate students in an on-campus graduate mobile home park. Responsibilities included welcoming new students to the Stanford campus; planning social, educational, and multi-cultural programs; serving as a liaison between the residents and the Stanford administration; serving as a leader during emergencies; resolving conflicts between residents; and providing counseling. Activities included helping roommates resolve conflicts, referring a clinically-depressed resident to the campus psychological services, establishing a resident-run weekly movie night series, inviting Secretary of State George Shultz to speak, and leading numerous trips, e.g., to the San Francisco Airport air traffic control tower, to build apartments for Habitat for Humanity, skiing, etc.

Graduate Housing Advisory Committee Chairperson (1992–94)
STANFORD UNIVERSITY.
Chaired meetings of graduate students and Stanford graduate housing officials to improve on-campus graduate housing. Prepared the agenda for biweekly meetings and ensured decisions were made. Accomplishments included changing the officials' philosophy on rental rates to reflect the different dormitories' conditions, encouraging a university-wide graduate housing renovation project, and encouraging a change in the housing schedule to permit residents more than one day to move into and out of apartments.

Rice University Interviewer (1994–1999)
RICE UNIVERSITY. http://www.futureowls.rice.edu/futureowls/Admission_Home1.asp
Interviewed prospective Rice University undergraduate students living in Silicon Valley, California. Learned what motivated these high school students and about their interests to determine whether they should be admitted to Rice University. Answered their questions about being an undergraduate at Rice University. For each interview, submitted interviewer report to be included with the student's application.

Youth Ministry (2000–2001)
FIRST UNITED METHODIST CHURCH, SUNNYVALE, CA.
Created and developed youth ministry program for youth in sixth through tenth grades. Researched other local churches' programs, recruited youth to participate, organized a district-wide event, advertised the program to the congregation, recruited adult volunteers to assist, created and executed biweekly programs.

Administrative Council Chairperson (1996–1999)
FIRST UNITED METHODIST CHURCH, SUNNYVALE, CA.
The church's Administrative Council oversees its administration and programming, establishing objectives and goals, determining policies, and evaluating the church's ministries. As chairperson, I was responsible for ensuring the committees fulfill their missions, conveying information between committees, and serving ex-officio on the Finance, Pastor-Parish Rela-

tions (personnel issues), and Senior Nutrition Program (an outreach program administered by the church and receiving government funding) Committees.

Lay Minister (1996–1999)
First United Methodist Church, Sunnyvale, CA.
Responded to members' spiritual and emotional needs, e.g., when experiencing the death of a loved person, dealing with a terminal disease, or losing a job.

Staff-Parish Relations Committee member (1995–97)
First United Methodist Church, Sunnyvale, CA.
The committee oversees church staffing by hiring, evaluating, and firing the pastor and the church staff. Wrote the church's employee handbook describing hiring procedures, job performance evaluation, benefits, and job termination. Gained experience writing job descriptions and hiring employees.

Service Project Coordinator (1991–92)
Memorial Drive United Methodist Church, Houston. http://www.mdumc.org/
Organized monthly service projects for a group of fifty single young adults. Responsibilities included locating service opportunities, contacting other organizations to participate, recruiting participants from the class, and ensuring proper execution of the events.