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report library offers many benefits

[The Computing Research Association (CRA) strongly endorses the concept of unified electronic access to computer science technical report literature and encourages member institutions to catalog their reports using the Networked Computer Science Technical Report Library (NCSTRL) system. At its July meeting, the CRA Board passed a motion supporting NCSTRL.]

By Alan L. Selman
The Networked Computer Science Technical Report Library (NCSTRL) is a digital library for technical reports from computer science departments and research laboratories. The library will benefit the departments that contribute to it, researchers who consult it, students who access the library for their course work, and authors whose work makes up the corpus. Currently, 29 Computer Science Departments and research laboratories contribute to it. The library is stable and provides convenient, quality access. Minimal effort is required of departments, and the cost is far less than the cost of managing a paper collection.

It is becoming more difficult for departments to manage their technical report collections. An increasing number of high-quality reports are being produced at more research organizations, yet department operating budgets are decreasing. By contributing to NCSTRL, departments will eliminate the cost of printing, storing, and distributing paper technical reports. Charging for reports would merely escalate costs and results may be browsed by table of contents or thumbnail images, raw data from the database can be found at http://cra.org/NCSTRL

By Juan Antonio Osuna
CRA Staff
The Computing Research Association has extracted data about computer science Ph.D. programs from a recent National Research Council (NRC) study and assembled an interactive database on its Web server. From this database, users can rank up to 100 Ph.D. programs based on any of 20 characteristics, such as female or minority representation, that were reported in the study. Background information and links to the database can be found at http://cra.org/NRCStudy

Released Sept. 12, the NRC report offers the most comprehensive assessment of research-doctorate programs ever, examining the quality of scholars, teaching effectiveness and other characteristics of more than 3,600 doctoral programs in 41 fields at 27 universities nationwide.

In 1982, the NRC conducted a similar study. However, the latest one incorporates new fields and programs, refined techniques and provides a benchmark for future studies.

Ratings of CS programs extracted from the September report were based on data collected in 1993 from 221 computer science researchers. Students can find out about the work of faculty electronically, with minimal guidance. Thesis students can use NCSTRL to familiarize themselves with current research in their chosen area.

NCSTRL has a World Wide Web interface. The interface supports searching by author, title or abstract, and results may be browsed by table of contents or thumbnail images, raw data from the database can be found at http://cra.org/NCSTRL

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Expanding the Pipeline

CS gender gap still a problem

By Clark Thomborson

Like Mary Jane Irwin of Pennsylvania State University and many others, I am disturbed by the number of women in academic computer science. That’s an understatement; I am increasingly alarmed. Over the past decade, gender balance at the undergraduate level in computer science has steadily deteriorated in the United States. I don’t like the current situation in the undergraduate classroom, and I am afraid of what it portends for gender balance at the faculty level in the future. My motivation: I don’t want to work in a gender-segregated workplace for the rest of my life.

When I first started teaching at the University of California at Berkeley in 1979, there weren’t many female students in my undergraduate classes. In a class of 36, there might be five women. The gender mix, or rather the lack thereof, was even more noticeable at the graduate level. In a seminar of 10 students, it was rare to see more than a couple of women. And I was one of very few female faculty members. This was far from a gender-balanced workplace, but at least the situation seemed to be improving.

A decade ago, there was a sudden change in my perception of the gender ratio among CS bachelors degrees. The gender ratio among CS undergraduates improved from 20% to nearly 40% from 1975 to 1984. Since then there has been a steady decline. A corroboration of the latest data in my possession, in the class of 1993 only 28% of the computer science B.S. degree recipients in the United States were female. This is a national average.

At major research universities, there are even fewer women in CS undergraduate programs than suggested by the national averages discussed above. The Massachusetts Institute of Technology Planning Office performed a detailed analysis of the NACES data for the class of 1990. The percentage of females among the CS undergraduate degree recipients that year at the top 12 schools, as ranked in the CRA Taulbee Survey, was 22% at Stanford, 21% at MIT, 24% at Carnegie Mellon, 31% at the University of California at Berkeley, 13% at Cornell University, 12% at the University of Illinois at Urbana-Champaign, 19% at the University of Washington, 21% at the University of Texas at Austin, 30% at the University of Wisconsin Madison, and 25% at the University of Southern California. NACES had no data for 1990 CS undergraduate degrees from the University of California at Los Angeles or the University of Toronto. Note that only Berkeley and Madison approached the 1990 national average (30%) gender ratio for undergraduate CS degree recipients.

A third data series, recently added to the annual CRA Taulbee Survey, showed that only 18% of the undergraduate CS degree recipients in 1990 were female. This 18% figure is a close match to the “top 12 schools” data quoted in the previous paragraph. I don’t think the CRA Taulbee data is directly comparable to the NACES data quoted above; the percentages are too far apart. I don’t have 1994 data from NACES, nor do I have 1993 data from the CRA Taulbee Survey because there was no data from 1993.

Before high school students take the graded portion of an SAT exam, they may be interested in the gender balance. The CRA Taulbee data is directly comparable to the NACES data quoted above; the percentages are too far apart. I don’t have 1994 data from NACES, nor do I have 1993 data from the CRA Taulbee Survey because there was no data from 1993.

There is a downward trend in gender balance even in computer science. The recent downward trend in computer science is due to a difference in survey methodology and scope, i.e., that the CURS data for 1994 will show a dramatic drop in the gender ratio for CS bachelor’s degree recipients in the United States.

The recent downward trend in female computer science participation in computer science is likely to continue. In 1994, the percentage of females among the CS bachelor’s degree recipients in the United States was 18%.

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Student criteria

A applicant should be female undergraduates (U.S. citizens or permanent residents) who are attending a U.S. college/university and who are seriously considering graduate studies in CS&E. First consideration will be given to sophomores and juniors (completing two or three years by summer 1996). However, first-year students with the skills needed for research and seniors considering graduate school later than September 1996 may also apply. Primary criteria for selection are:

1) The student's experience and skills must match the needs of some professor's research project.
2) The student's research and recommendations should give some indication of the student's potential for success in graduate school.
3) The student's circumstances are such that the student stands to gain the most from the experience—for example, students at institutions unable to offer research opportunities with female professors.

Professor criteria

Potential mentors should be female CS&E professors at U.S. universities with active research programs into which the students may be integrated. The primary criteria for selection are:

1) The professor should have a research project suitable for undergraduates that matches the skills of some student applicants.
2) The professor's university environment should be conducive to the goals of the mentoring project. For example, an active graduate summer research population provides the protege with a window on future graduate life.
3) The professor should have demonstrated some skill in the delicate task of mentoring undergraduates.

Pipeline from Page 2
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1. **Working environment and lodging information:** All materials are due February 1, 1996. A committee will evaluate the applications and select at least 20 student/professor matches for funding. Students and mentors will be notified by March 15, 1996. Funding consists of up to $5,000 per match. Some of this money is given directly to the student to pay a stipend and cover conference travel (lodging costs vary, typically about $1,000–$1,500). CRA reimburses travel expenses. A student's funding is intended to cover up to 10 weeks of research in the summer of 1996, but alternative arrangements are possible. Mentors and their universities receive no funding for the summer, but limited funds will be available to cover conference travel for selected students and mentors after the summer of research.

2. **Mentors and students will be given training packages on mentoring and will be expected to participate in an electronic discussion group. This will provide additional mentoring opportunities while also sharing the load among mentors, and it will establish cohesiveness among all participants. It is intended to be a source of support for mentors and students.**

3. **The evaluation follows an individual evaluation, covering all five years of the project (1994-98). This third-party evaluation is intended to provide formative feedback and to assess the long-term impact of the project. The evaluation is not intended to check on the performance of individuals participating in the project, and participants' anonymity will be maintained as far as possible.** All participants are expected to take part in the evaluation; the time involved will be minimal.

Copies of the application form and other useful information can be accessed on the Web at http://


All materials are due February 1, 1996. Electronic submissions are encouraged; send e-mail to cranet@cr a.org. On electronic information should be sent to Anne Condon, Computing Sciences Department, University of Wisconsin-Madison, Madison, W I 7706, Tel: 608-262-3138; fax: 608-262-9777.

**Pipeline from Page 2**

digets of their answers, broken down by gender and broad major field. I’ve plotted the absolute numbers of high school students expressing interest in computer science separately for females and males, in Figures 1 and 2. These are area charts, so each line indicates the cumulative total of the majors mentioned below. For example, Figure 1 shows that in 1994, about 60,000 high school females declared an intention to major in science and engineering (reading from the top line). About 10% of these females planned to major in the biological sciences. In Figure 2, we see that about 120,000 females intended to major in science and engineering in 1994; the majority of these females planned to major in engineering. A mong academic disciplines within science and engineering, computer science stands out as the only field with a downward trend in interest among high school females (see Figure 3). I am particularly concerned by a sharp downward trend in 1991 through 1994, from 37% to 29%. I fear this eight-point drop in gender ratio among intended majors in 1991-94 portends an eight-point drop in the gender ratio among CS bachelor's degree recipients in 1994-98. Note that the 1982-85 drop in gender ratio among intended CS majors occurred just before the 1985-88 drop in gender ratio among CS bachelor's degree recipients.

My intent in writing this column is to spark discussion of why computer science is becoming more gender-segregated at the undergraduate level. More importantly, what can we do about it? I hope you are inspired to discuss these questions with your friends and colleagues, send me e-mail at chomber@cs.wisc.edu, write something for publication or get involved in a mentoring or outreach program.

Clark T Homberson is a visiting professor at the University of Minnesota at Twin Cities. In early 1996 he will become a chaired professor of computer science at the University of New Zealand.
### Need for supercomputer centers still exists

**By Fred W. Weingarten**

**New Analysis**

The Task Force on the Future of the National Science Foundation's Supercomputer Centers, chaired by Edward H. Ayes of Ohio State University, has been circulating a draft report guiding NSF on the renewal of grants for the centers.

The draft report was circulated for discussion, but reaction was fairly muted. Science magazine carried an article on it, and several researchers in the community commented on the document, which is still being refined. At press time, a final version still had not been presented for approval by the National Science Board (NSB). However, unless a crisis strikes, the report could well be approved by the time you read this article. The basic outline of the analysis and recommendations are clear, however, and unlikely to change significantly.

The purpose of the report is to guide NSF in dealing with the upcoming expiration of the current set of agreements with the four national centers. The centers have been operating for nearly 10 years and are costly investments. Even in the best of times, NSF— in particular, NSB— has been uncomfortable with large, open-ended commitments. And these are not the best of times. NSF's budget is likely to be flat or muted.

### Policy News

**CRA's Lazowska to testify at HPCC renewal hearing**

Ed Lazowska, a CRA Board member and chair of the Committee on Government Affairs, was scheduled to testify for CRA on the High-Performance Computing and Communications Act at an October 31 hearing of the House Science Subcommittee on Basic Research. Lazowska is chair of the Department of Computer Science and Engineering at the University of Washington.

The HPCC Act is now four years into its five-year term, and the subcommittee is looking into whether the law has been successful and if it should be reauthorized.

CRA has been active in the HPCC legislative debate for several years. It advised the then Committee on Science and Technology on the drafting of the original bill, including testimony by Paul Young, then chair of CRA. At that time, CRA strongly urged that the bill specifically establish support of basic research and human resources as one of the main program objectives.

Two years ago when a follow-on bill (HR 1757) was being considered by Congress, CRA again testified and participated in discussions on the shape of the legislation. That legislation was passed by both houses in different forms but never got out of a conference to reconcile the two. The problems arose not with the HPCC bill but with unrelated legislation in the Senate version.

Lazowska's testimony will be posted on CRA's Web page (http://cra.org).

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Clinton threatens to veto 1995 omnibus science act


H.ouse Science Committee Chair Robert S. Walker (R-PA) introduced HR 2405 in late September. The bill authorizes fiscal 1996 and 1997 appropriations for the National Science Foundation, NASA, the Department of Energy, the National Institute of Standards and Technology, the National Oceanographic and Atmospheric Administration, the Environmental Protection Agency and the U.S. Fire Administration. Total spending authorized for 1996 is $21.5 billion, $3 billion less than what was budgeted for those agencies in 1995 and about $3.3 billion less than the president’s 1996 budget request for those agencies.

The seven separate authorization bills should be considered as a package “to make the point that science is a national issue deserving of major national attention... to consider civilian science R&D as a whole, in order to set better priorities... [and] to make it clear that science is vital to our long-term economic interests,” Walker said in a press release. “With HR 2405, we are attempting to elevate science to the same kind of consideration that our defense priorities have always had.”

The Clinton administration opposes the legislation. In a statement released by the White House in October, Vice President Al Gore said the legislation, which “seeks to eliminate critical investments in civilian technology, is unwarranted, unwise and unnecessary.”

“Congress, through this bill, is taking direct aim at federal investments in high-risk, long-term research and development,” Gore said. “This bill effectively eliminates those merit-based, cost-shared efforts, such as the Commerce Department’s Advanced Technology Program and the Manufacturing Extension Partnership Program, that bridge the gap between basic research and commercial development of products.”

A statement of administration policy said cuts in NSF’s budget would mean “investments in basic research and collaboration will have to be curtailed.” NSF’s budget for High-Performance Computing and Communications would be decreased 50%, the statement said.

“The appropriation authorization levels for the Commerce Department’s civilian technology programs are unacceptable. The fiscal 1996 authorization of appropriations for the entire National Institute of Standards and Technology of $383 million represents a reduction of $858 million less than the president’s budget,” the policy statement said. “Such a drastic cut will undermine the NIST labs’ ability to provide the scientific and industrial community with the measurement base essential to industrial competitiveness and public health and safety.”

OTA closes after 24 years

The Office of Technology Assessment closed Sept. 29 after serving for 24 years as an independent nonpartisan analytical agency that assisted Congress with complex technical issues.

Congress withdrew OTA’s funding, leaving only a few staff members to assist with the closing. The telephone will be answered until Jan. 31, 1996 (tel. 202-224-3695).

To receive copies of OTA publications, contact Superintendent of Documents, PO Box 371954, Pittsburgh, PA 15250-7974; tel. 202-512-2250. Publications are available on paper or microfiche from the National Technical Information Service. To confirm prices or to order, call tel. 703-487-4650; for rush orders, call tel. 800-553-NITS.

OTA reports and background papers will be available for study at the University of Maryland at College Park, George Mason University in Virginia and the University of California at Santa Barbara.

Electronic versions of 1994 and 1995 reports are available at the agency’s World Wide Web site (http://www.ota.gov). The site will be mirrored by the Government Printing Office (http://www.access.gpo. gov/ota), the National Academy of Sciences (http://www.nas.edu) and the Woodrow Wilson School of Public and International Affairs at Princeton University (http://www.was.princeton.edu).

Strawn newborn division head

George O. Strawn is the new head of the Division of Networking and Communications Research and Infrastructure within the National Science Foundation’s Computer and Information Science and Engineering directorate.

He served previously as the NSFnet program director and comes from the Iowa State University Department of Computer Science and Computation Center, where he spearheaded the development of distributed computing facilities for research and education and has led several statewide networking initiatives.

In 1969 Strawn earned a Ph.D. in mathematics from Iowa State, where he remained for most of his career. His professional research interests include programming languages, library automation and the management of academic computing organizations.
Hopper conference tapes now available

As general chair of the 1994 Grace Hopper Celebration of Women in Computing, I want to personally urge you to purchase for your department this set of 15 conference videolecures by leading women in computer science.

Although the technical quality of the material is extraordinarily high and appropriate for both male and female audiences, the tapes provide inspiration for women. I wish such tapes, presenting senior role models in the field, had been available when I was in graduate school.

I believe every computer science department, library and guidance center should have this collection readily available to recruit women and inspire them to stay in the computer science field.

— Anita Borg

Conference Information

The First Grace Hopper Celebration of Women in Computing was held in Washington, DC, June 9-11, 1994. Its purpose was to celebrate the continuing achievements and contributions of women in computing.

The conference featured 17 leading women in computer science. We are offering videolecures of 15 presentations. Due to technical difficulties, we are unable to offer the presentations by Irene Greif of Lotus Development Corp. and Elaine Cohen of the University of Utah.


Videolecure Topics

**Topic Category: Women in Computer Science (4 tapes, #1-4)**

1) Woman in Computer Science
   - Mildred Dresselhaus, Massachusetts Institute of Technology
   - Order #GMH-Dresselhaus 55 minutes
2) Making Electronic Learning Environments Succeed for Girls and Boys
   - Maria Klawe, University of British Columbia
   - Order #GMH-Klawe 38 minutes
3) Strategic Defense Research
   - Anita Jones, Defense Department
   - Order #GMH-Jones 52 minutes
4) The Management Option
   - Panel Discussion. Moderator: Bronwyn Fryer, Working Woman magazine
   - Order #GMH-Panel-2 81 minutes

**Topic Category: Object Technology (1 tape, #5)**

5) The Structure of Distributed Programs
   - Barbara Liskov, Massachusetts Institute of Technology
   - Order #GMH-Liskov 47 minutes

**Topic Category: Software Engineering & Programming (3 tapes, #6-8)**

6) Computers and Risk
   - Nancy Leveson, University of Washington
   - Order #GMH-Leveson 39 minutes
7) Abstraction and Codification in Software Engineering
   - Mary Shaw, Carnegie Mellon University
   - Order #GMH-Shaw 45 minutes
8) Language Implementation
   - Susan Graham, University of California at Berkeley
   - Order #GMH-Graham 44 minutes

**Topic Category: Information Superhighway (2 tapes, #9-10)**

9) Encryption—A Sword That Cuts Two Ways
   - Dorothy Denning, Georgetown University
   - Order #GMH-Denning 42 minutes
10) Information Highway: Computers and Policy Issues
    - Panel Discussion. Moderator: Barbara Simons, IBM Corp.
    - Order #GMH-Panel-1 80 minutes

**Topic Category: Human-Computer Interaction (2 tapes, #11-12)**

11) Cooperative Agents: Man and Human
    - Ruzena Bajcsy, University of Pennsylvania
    - Order #GMH-Bajcsy 46 minutes
12) Collaborative Plans and Dialogue Participation
    - Barbara Grosz, Harvard University
    - Order #GMH-Grosz 38 minutes

**Topic Category: Natural Language (1 tape, #13)**

13) Finding the Information Wood in the Natural Language Trees
    - Karen Spärck Jones, Cambridge University
    - Order #GMH-Sparck-Jones 41 minutes

**Topic Category: Parallelism (1 tape, #14)**

14) Design Challenges in Massively Parallel, Fine-Grain Architectures
    - Mary Jane Irwin, Pennsylvania State University
    - Order #GMH-Irwin 40 minutes

**Topic Category: Compilers (1 tape, #15)**

15) Compilers—New Challenges and New Directions
    - Fran Allen, IBM T.J. Watson Research Laboratory
    - Order #GMH-Allen 41 minutes
Professional Opportunities

Send copy and payment for Professional Opportunities advertisements to AIP/Computing Research News, 1801 Neil Avenue, Suite C, West Lafayette, IN 47907. The rate is $2.00 (US) per word. Payment and proofs orders and checks are acceptable (please do not send cash). All C.R.A. members receive at least 200 free words per dues year. Advertisers may also request that their Professional Opportunities ads be posted to C.R.A.'s jobs online listing and the jobs Index on C.R.A.'s home page. This service is free to our advertisers.

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Computing Research News is published five times per year. In January, March, May, September and November. Professional Opportunities ads with application deadlines falling within the month of publication will not be accepted unless the ad says applications will be accepted until the position is filled or a specific closing date mentioned in the preceding month before publication. The deadline for the January issue is December 1.

Rensselaer Polytechnic Institute

The Computer Science Department invites applications for a tenure-track position in the area of parallel and distributed systems. The department, located in a broad area of technology, includes areas of research such as algorithms, artificial intelligence, compilers, computer science infrastructure, and distributed and parallel computing. The successful candidate will be expected to develop a program of research, contribute to the education of students, and serve as a collaborator with researchers in the department. The department has faculty engaged in research in areas of parallel and distributed computing, and the candidate will have the opportunity to collaborate with these faculty members. The department offers B.S., M.S. and Ph.D. degrees in computer science, a high number of undergraduate students, 60 master's students and 60 Ph.D. students.

The department is interested in candidates who have a proven record of excellence in research and teaching. The successful candidate will have a Ph.D. in computer science or a closely related area. Applicants should send a letter of application, curriculum vitae, and three letters of reference to: Dr. Robert B. Biermann, Faculty Search Chair, Department of Computer Science, Rensselaer Polytechnic Institute, Troy, NY 12180-3990. Women and minority candidates are encouraged to apply.

New York University

Department of Computer Science

The Department of Computer Science invites applications and nominations for a tenure-track or tenured position in the area of artificial intelligence. The successful candidate will be expected to develop a program of research, contribute to the education of students, and serve as a collaborator with researchers in the department. The successful candidate will have a Ph.D. in computer science or a closely related area. Applicants should send a letter of application, curriculum vitae, and three letters of reference to: Prof. Iosif Walukiewicz, Search Chair, Department of Computer Science, New York University, 1 Washington Place, Box 171, New York, NY 10003-6560.

Duke University

Department of Computer Science

We invite applications and nominations for two positions at the tenure-track or tenured level in the area of computer science. The successful candidate will be expected to develop a program of research, contribute to the education of students, and serve as a collaborator with researchers in the department. The successful candidate will have a Ph.D. in computer science or a closely related area. Applicants should send a letter of application, curriculum vitae, and three letters of reference to: Prof. Iosif Walukiewicz, Search Chair, Department of Computer Science, New York University, 1 Washington Place, Box 171, New York, NY 10003-6560.

University of California, Irvine

The Computer Science and Engineering Department invites applications for a tenure-track faculty position in the area of parallel and distributed computing. The successful candidate will be expected to develop a program of research, contribute to the education of students, and serve as a collaborator with researchers in the department. The successful candidate will have a Ph.D. in computer science or a closely related area. Applicants should send a letter of application, curriculum vitae, and three letters of reference to: Prof. Iosif Walukiewicz, Search Chair, Department of Computer Science, New York University, 1 Washington Place, Box 171, New York, NY 10003-6560.

Professional Opportunities continue on Page 8

Computing Research News
University of Illinois, Urbana-Champaign
Department of Electrical and Computer Engineering

The Department of Electrical and Computer Engineering at the University of Illinois at Urbana-Champaign offers a diverse and dynamic academic environment for both teaching and research. The department is known for its excellence in teaching and research, and is committed to providing a world-class education to its students. The department is particularly interested in individuals with research interests in experimental systems, high-performance computing, and distributed multimedia computing. The department over the next several years will be adding new faculty members to expand its research and instructional capabilities.

Applications from individuals with an interest in distributed computing, high-performance computing, and distributed multimedia computing, who would broaden and complement the research interests of the faculty in architecture, compilers, computer networks, computer operating systems, robots and scientific computing, are encouraged to apply. The University of Illinois at Urbana-Champaign is committed to the diversity of its faculty and students.

The University of Illinois at Urbana-Champaign is an equal opportunity, affirmative action employer.

University of Arizona
Department of Computer Science

The Department of Computer Science at the University of Arizona is a dynamic and growing department, with a strong commitment to excellence in teaching and research. The department seeks outstanding candidates for tenure-track faculty positions in computer science. The department has a number of substantial research opportunities and is part of the National Science Foundation Computer Science and Engineering Research Infrastructure grant. The department has a number of exciting research opportunities in areas such as artificial intelligence, parallel and distributed computing, and networking.

Candidates must be prepared to conduct active research and to participate in the educational mission of the department. The department offers a range of both undergraduate and graduate programs, including a strong Ph.D. program. The department is particularly interested in candidates with research interests in experimental systems, architectures, and high-performance computing.

Applicants should submit a curriculum vitae, a statement of research interests, a list of publications, and three letters of recommendation to the Department of Computer Science, University of Arizona, Tucson, AZ 85721. Applications received by Jan. 15, 1996, will be given full consideration.

The University of Arizona is an equal opportunity, affirmative action employer, ADA—compliant employer.

University of Texas, Austin
Department of Computer Sciences

The Department of Computer Sciences at the University of Texas at Austin invites applications for tenure-track positions at all levels, particularly in the areas of high-performance computing, distributed multimedia computing, and networking. The department is particularly interested in candidates with research interests in experimental systems, high-performance computing, and networking.

Candidates must have a Ph.D. degree or equivalent experience and qualifications. Applicants should have a commitment to excellence in teaching and research, and are expected to contribute to the department's research and educational missions. The department seeks candidates who are committed to diversity in the faculty and in its graduate student body.

Applications are invited from individuals with research interests in experimental systems, high-performance computing, and networking. The department seeks candidates who are committed to diversity in the faculty and in its graduate student body.

The University of Texas at Austin is an equal opportunity, affirmative action employer, ADA—compliant employer.

University of Denver
Department of Mathematics and Computer Science

The University of Denver is a medium-sized, private, coeducational liberal arts university located in the Denver metropolitan area. The university has a diverse and growing student body, and is committed to offering high-quality undergraduate and graduate education.

The Department of Mathematics and Computer Science at the University of Denver offers a range of both undergraduate and graduate programs, including a strong Ph.D. program. The department has a number of exciting research opportunities in areas such as artificial intelligence, parallel and distributed computing, and networking.

Candidates must be prepared to conduct active research and to participate in the educational mission of the department. The department offers a range of both undergraduate and graduate programs, including a strong Ph.D. program. The department is particularly interested in candidates with research interests in experimental systems, architectures, and high-performance computing.

Applicants should submit a curriculum vitae, a statement of research interests, a list of publications, and three letters of recommendation to the Department of Mathematics and Computer Science, University of Denver, Room 220, Doudna Hall, The University of Denver, Denver, CO 80208-0230.

The University of Denver is an equal opportunity, affirmative action employer, ADA—compliant employer, and an affirmative action employer.

Purdue University
Department of Computer Sciences

The Department of Computer Sciences at Purdue University is a dynamic and growing department, with a strong commitment to excellence in teaching and research. The department has a number of substantial research opportunities and is part of the National Science Foundation Computer Science and Engineering Research Infrastructure grant. The department has a number of exciting research opportunities in areas such as artificial intelligence, parallel and distributed computing, and networking.

Candidates must have a Ph.D. degree or equivalent experience and qualifications. Applicants should have a commitment to excellence in teaching and research, and are expected to contribute to the department's research and educational missions. The department seeks candidates who are committed to diversity in the faculty and in its graduate student body.

Applications are invited from individuals with research interests in experimental systems, high-performance computing, and networking. The department seeks candidates who are committed to diversity in the faculty and in its graduate student body.

The University of Illinois at Urbana-Champaign is an equal opportunity, affirmative action employer, ADA—compliant employer.

University of Denver
Department of Mathematics and Computer Science

The University of Denver is a medium-sized, private, coeducational liberal arts university located in the Denver metropolitan area. The university has a diverse and growing student body, and is committed to offering high-quality undergraduate and graduate education.

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Applications are invited from individuals with research interests in experimental systems, high-performance computing, and networking. The department seeks candidates who are committed to diversity in the faculty and in its graduate student body.

The University of Denver is an equal opportunity, affirmative action employer, ADA—compliant employer.
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**Professional Opportunities**

**University of Wisconsin**

Department of Computer Science

**Assistant/Associate Professor** (Data mining and information sciences)

The Department of Computer Science at the University of Wisconsin invites applications for full-time, permanent, tenure-track positions at the Assistant or Associate Professor level. These positions are at the assistant professor level, although appointments at the associate and full professor levels will be considered for highly qualified applicants. The two areas of primary interest are data mining and information sciences. Applicants should have a Ph.D. in computer science or a related discipline and a strong commitment to teaching, guiding research experience and a demonstrated ability to define new and innovative research directions are required.

The Department of Computer Science at the University of Wisconsin has a strong research program and is located in the thriving downtown commercial area of Iowa City. The university is located in the College of Engineering, the largest university-owned teaching hospital in the United States. The university also has a high concentration of high-technology companies such as the SAS Institute, IBM, Glaxo-Wellcome, Bell-Northern Research and major research institutions such as EPA and NERL/OPR. Women and minority candidates are especially urged to apply for this position. The university enjoys a unique combination of unsurpassed opportunities for outdoor recreation and easy access to major metropolitan centers. Interested candidates should send their curriculum vitae, including citizenship and visa information, to faculty-applications@cis.ohio-state.edu with the word “information” in the subject field. Evaluation of applications will commence on or about August 15, 1996. Women and minority candidates are especially encouraged to apply.

**Pennsylvania State University**

Department of Computer Science and Engineering

The Department of Computer Science and Engineering is seeking qualified candidates for two tenure-track positions in the Department. Ph.D. degree in computer science is required. University teaching experience and a strong commitment to teaching and guiding research experience are expected. The application package must include a cover letter, a curriculum vitae, a statement of research interests and a list of three references.

Applications are being accepted in areas related to computer networking and software engineering, as well as in areas where computer science interacts with other disciplines. Interested candidates should send their curriculum vitae, including citizenship and visa information, to faculty-applications@cis.ohio-state.edu with the word “information” in the subject field. Evaluation of applications will commence on or about August 15, 1996. Women and minority candidates are especially encouraged to apply.

**University of Minnesota**

Department of Computer Science

**Assistant Professor** (Database management and knowledge discovery)

The Department of Computer Science at the University of Minnesota is seeking candidates for an Assistant Professor position in the area of database management and knowledge discovery. The database research area is very active in the campus and the larger computer research community. The successful candidate is expected to have a strong commitment to teaching as well as good research potential. The Department of Computer Science enjoys strong interactions with other departments at the University and with companies such as the SAS Institute, IBM, Glaxo-Wellcome, Bell-Northern Research and major research institutions such as EPA and NERL/OPR. Women and minority candidates are especially urged to apply for this position. The university enjoys a unique combination of unsurpassed opportunities for outdoor recreation and easy access to major metropolitan centers. Interested candidates should send their curriculum vitae, including citizenship and visa information, to faculty-applications@cis.ohio-state.edu with the word “information” in the subject field. Evaluation of applications will commence on or about August 15, 1996. Women and minority candidates are especially encouraged to apply.
**Continued on Page 12**
Salton was born in Nürnberg, Germany, in 1927, but was forced to flee the country during World War II. He came to the United States in 1947 and became a US citizen in 1952. He received a B.A. (1950) and an M.A. (1952) in mathematics from Brooklyn College.

Salton earned his Ph.D. at Harvard University and stayed as an assistant professor (1959-60) and assistant professor (1960-65). “Salton was the last of Howard’s Aikens’ Ph.D. students—and also one of the first programmers for the Harvard Mark IV computer,” the press release said. He was interested in natural-language processing, especially information retrieval, and began the SMART information retrieval system in the 1960s (allegedly, SMART is known as “Salton’s Magical Automatic Retriever of Text”), the release said.

In 1965, Salton helped create Cornell’s Department of Computer Science and he stayed at the university for the next 30 years. He is main research tool was the SMART information retrieval system and “ideas in this work fundamentally changed full-text processing methods on computers and provided the field of information retrieval with solid underpinnings,” the press release said.

Many well-known information retrieval concepts were introduced as a result of SMART, including the vector space model, sophisticated statistical term weighting schemes that distinguish concepts important for text retrieval from other more marginal concepts, and the relevance feedback technique for query optimization.

Salton was a prolific writer. He published five texts on information retrieval and more than 150 research articles in the field.

Salton’s research earned him many awards. He was a Guggenheim fellow in 1962 and became an Association for Computing Machinery fellow in 1995. Two of his books and papers won A SIG Award in 1989.

Salton won a prestigious German “Alexander Humboldt Senior Scientist Award” in 1981 and the A SIG Award of Merit in 1989.

In 1983, the ACM Special Interest Group on Information Retrieval (SIGIR) created an AWARD for Outstanding Contributions. Salton received the first award, “marking him as the premier figure in the field,” the press release said.

Over the years he served as editor-in-chief of ACM Communications and the ACM Journal. And when he died, he was an editor of the ACM Transactions on Database Systems.

Salton served on the ACM Council for seven years, “where his no-nonsense style and his adherence to principles made themselves felt,” the press release said. He was active in SIGIR since its creation and served as its chair in 1979-83.

Salton also was chair of the American Association for the Advancement of Science’s Section T for several years and was on the Board of Directors of the American Society for Information Science.

“Gerry upheld the highest standards of scholarship for himself, his students and his colleagues,” the press release said. “He was a nurturing, caring adviser. He supervised 20 Ph.D. students, who are now in industry and academia.”

Contributions may be made to the Gerald Salton Distinguished Lectureship Series in Computer Science. Contact Masha Pickens, Carpenter Hall, Cornell University, Ithaca, NY 14853.

Gerald Salton

Library from Page 1

3) Select one of the documents from the hit list. The gateway retrieves the document and makes it available to the user for reading or browsing or for downloading for printing.

The technology underlying NCSTRL is a network of interoperating digital library servers and FTP repositories. A department may choose to contribute to an NCSTRL server in two ways: either as an NCSTRL-Standard site or as an NCSTRL-Lite site. A Standard site runs a server and maintains an FTP repository. The NCSTRL-Lite site maintains only an FTP directory. The level of functionality for Standard sites is higher than for Lite sites. To make this choice, an individual department needs to balance the level of resources it can dedicate with the level of functionality it wishes to provide.

There are several differences in functionality:

• Standard sites can provide customized user interfaces to their collection. They can create special browsing interfaces to help users scan all documents in the local collection. Lite sites do not run any local user interface and rely on one of the other user interface gateways.

• Standard sites store bibliographic data locally and maintain their own search engines. This gives these sites immediate control over the contents of bibliographic records and the ability to install more powerful search engines and search interfaces. Lite sites submit bibliographic records to the central indexing site and do not control any of the actual indexing technology.

• Standard sites have the ability to store and provide access to documents in multiple formats. Lite sites can only provide access to a single document format, generally PostScript.

• Standard sites can provide a number of additional user interface features, such as page zooming, which is an interface for downloading and printing selected pages, and an interface for displaying and accessing the logical structure of documents—chapters, sections and so on. The cost of the sites are the start-up expenses of installing the software and preparing bibliographic records for the initial collection and the continuing costs of installing new releases and maintaining the collection. Lite takes about an hour to install, and Standard takes about two days. E-mail and telephone assistance will be available. Preparing bibliographic records is a simple clerical task. Installing new releases takes about two days. The largest cost is establishing the procedures to ensure that new reports continue to be received. The actual labor is small, only a few minutes per document, but it requires a commitment from every author in the department. The cost of the disk is small; a high-capacity disk can easily store all of a site’s documents (in PostScript). Many departments already make all their reports available by FTP. These departments will find they can increase accessibility with a minimal increase in cost or effort. Most sites will place only their recent reports online, while others may choose to place their entire collection online, which will entail scanning the collection of older paper reports. A department might initially choose Lite, then move up to Standard after gaining experience.

With the NCSTRL project and architecture, the result is the collab
doration of two earlier successful technical report services. The first of these is Dlir, a result of the Advanced Research Projects Agency-funded C S-T-R project. The second is the National Science Foundation-funded VIDEA Technical Report Service, which originated as a recommendation of a workshop on managing university technical reports at the 1992 CRA Conference at Snowbird. Stable organizational structure will be provided by CRA representation and by the NCSTRL Working Group. The latter is an activity of the DLIB Forum, which is supported by A R T. The Forum is sponsored by the Information Infrastructure Technology and Applications Task Group of the High-Performance Computing and Communications program.

We are eager to add your depart
tment to the library. We stress that NCSTRL is self-explanatory and easy to use. A anyone is welcome to search and read the documents, provided they respect the terms and conditions of the contributors. To try NCSTRL, learn more about NCSTRL or get detailed installation information, see the NCSTRL home page at http://www.ncstl.org.

A lan L. Selman is professor and chair of the Department of Computer Science at the State University of New York at Buffalo. His principal research interest is complexity theory. Selman was one of the collaborators who helped to formulate WATERs, a precursor of NCSTRL.

NSF division director named

Richard B. Kiebzak has taken office as director for the National Science Foundation’s Division of Computer and Computational Research within the Directorate for Computer and Information Science and Engineering.

Kiebzak earned B.S. and Ph.D. degrees in electrical engineering from the University of Washington. He has taught at New York University, the State University of New York at Stony Brook and most recently at the O regon Graduate Institute of Science and Engineering.

He is experienced in functional programming languages, program transformations, and automatic program generation and the application of formal methods in software engineering.