A Team Project

Assignment 2

Database Concepts
Spring 2021
R.H.

Purpose: Analysis, design, implementation, and manipulation of a relational database using MYSQL database management system and SQL data language

Problem: The Journal of Computing for Professionals (JCP) is a bi-weekly publication which includes, scientific articles, announcements, job openings and student profiles of those students serve as the interns in the publishing house of the journal. The JCP authorities want you to:

1- (i) Analyze their journal contents by extracting semantic rules, converting the semantic rules into FDs and MVDs, (ii) Design a relational database by creating the universal relation employing the FDs and MVDs, normalizing the universal relation into (1NF, 2NF, 3NF, BCNF, 4NF), (iii) implementing the design by actually building the relational database using MYSQL and populating the relational database from the attached two copies of the journal, and (iv) Manipulate the database by answering a set of queries that are presented shortly.

To meet the above four steps, two issues of the JCP are attached to be used for the analysis and populating the database. It needs to be mentioned that both issues of the journal follow the same organizational format.

Develop a highly structured script to answer the set of queries cited below. For each query, type the query text itself as a comment, list your SQL codes for answering the query (list of the SQL codes is not commented). The output of the SQL codes implementation by MYSQL. The only acceptable format for the results (output) of a query is the one generated by MYSQL. Any changes in this format resulting in the dismissal of the query and receives score of zero.

List of queries:

a. Display (print) your entire database
b. Get the name of those conferences which hold outside of the United States.
c. Get the list of all conferences which hold in cooperation with IEEE.
d. To whom the papers should be sent for the 13th International Conference on Distributed Computing Systems and where is the location of this conference.
e. Get the list of authors who also serve as the conference committee members
f. How many call for papers are in the issue of August 1992.
g. Get the list of Jobs which are located in the same state as the conference on the Solid Model'93
h. Get the list of qualifications for all jobs available outside of United States.

i. We have forgotten to include two job announcements for the last issue. Add these job announcements to your database (Look for these jobs under the heading of LOST JOBS in the attachment)
j. The deadline for submitting a paper to the Solid Model'93 conference has been changed to December 30, 1992. Update your database to reflect the new date.
k. The university of Miami withdrew its add for open position yesterday. Delete this job announcement from your database.
l. Get the name of conferences which is sponsored by both SIGART and SIGCHI.
m. Get the list of authors who had a publication in both issues of the JCP
n. Get the name of students (serving as internets) who study in the same discipline as "Clara Prez Marcos" and they are originally from the same country as "Thomas Kavoory".

REMINDER: It is crucial that you design your database independent of the above queries. To make sure that you have done that, (two queries will be given to you on *demonstration day* that is not in the above list and your team will be asked to implement the two queries in a zoom meeting and within 30 minutes. Implementation of these unseen queries makes 10% of your grade for this team project. Make sure that on the demonstration day, you have with you the computer that your database is resided on.

2- Create two views as follows
View1: This view is used by the researchers and it includes the issue number, issue date, article title, article author(s), key words, and page numbers.
View2: This view is used by the job hunters and it includes the issue number, issue date, job title, job location, job status (tenure and non-tenure track), and salary

Turn in a highly organized report (One per team) that includes the analysis, design, implementation, and manipulation of the database. The report must have **three** distinct parts separated by colored dividers and one appendix. The first part includes the analysis and design of the database. The second part includes implementation of the database (*creating* database, *populating* database, and *displaying* the content of all database relations.) Part three includes **only** the implementation of the above queries and views. Each query/view follows the format mentioned under the "REMINDER" in item 1 above.

The appendix content will be described shortly.

Each team presents and defends the analysis, design, and implementation of their project on the *presentation day* (date of the presentation day will be announced in the classroom.) It is crucial that every team member be equally prepared to act as a presenter and defender of the project

because the presenter will be chosen at the time of presentation by the professor and not by the team. The presenter will be seriously challenged about every aspects of the project during the presentation. At the time of presentation only one team will be in the classroom. All presenters must use power point slides and be able to talk about the content of slides and not reading the slides' contents from the screen or from the notes. Please be reminded that your presentation also makes another 10% of your grade for this team project.

NOTES:
Team members are chosen randomly as is the case in real life (you do not pick your co-workers.) **One team member is designated as the captain of the team.** The duties of the captain are:

1. To keep minutes of every meeting by filling the following form for each meeting. **The minutes of meetings make the appendix of the final report**.

MINUTES OF THE MEETING

Date of Meeting: **Start time:** **End time:**

Name of members who were present:

Name of members who were late (The amount of time that member was late):

Members' duty assignments, and progress in reference to the previous meeting:

Name:	Duty:	Progress:
Name:	Duty:	Progress:
Name:	Duty:	Progress:
Name:	Duty:	Progress:
Name:	Duty:	Progress:

Time set for the next meeting:
Signature of all the present members:

Member 1	Member2
Member 3	Member4
Member 5	

2. To prepare the *Contribution Sheet* that includes names of team members along with their overall percentage of contribution to the assignment and their signatures. The Contribution Sheet goes after the cover letter in the final report. Any dispute on the percentage of contribution will be finalized by me using the minutes of the meetings.

3. If a member of the team does not participate regularly in the meetings or does not finish his/her assigned task, then team (not the Capitan) members must collectively make an appointment with me and report the lack of participation by the team member as soon as possible. The undedicated member will be **separated** from the team immediately and this member works on the assignment as a **team of one**. The same final report is expected from the team of one.

4. If a team has a question about the team project, then the entire team must be present in a zoom meeting (or another form of communications that is comfortable for all members) when the question is asked. This means, I will not respond to a question about any aspects of the project if it is asked by one member of the team. In the case of emergency, only the presence of the majority of the team members is required.

Attachments

Title of your report with font size of 16 and Bold

By: (Font 12)
Name of team members(Font 14 and Bold)

Submitted to: (Font 12)
Dr. Hashemi(Font 14 and Bold)

As (Font 12)
Assignment #2 (Font 14 and Bold)
for (Font 12)
Database Systems

Date of submission sits here (Font 12 and Bold)

Table of Contents

Subject	Page#
I. Introduction	1
II. Semantic Rules	3
1. Conversions	3
2. List of Attributes	12

Table of Figures

Figure #	Page#
Figure 1: Initial FD diagram.	12
Figure 2: Reduced FD diagram	14
Figure 3: Diagrams of the relations in 1NF	18

Table of Tables

Table #	Page#
Table 1: List of the attributes.	12
Table 2: List of the relations	14

The journal of

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ARIES: A Transaction Recovery Method Supporting Fine-Granularity Locking and Partial Rollbacks Using Write-Ahead Logging

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and
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IBM Santa Teresa Laboratory
and
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IBM Almaden Research Center

In this paper we present a simple and efficient method, called ARIES (*Algorithm for Recovery and Isolation Exploiting Semantics*), which supports partial rollbacks of transactions, fine-granularity (e.g., record) locking and recovery using write-ahead logging (WAL).

Categories and Subject Descriptors: D.4.5 [Operating Systems]: Reliability—*backup procedures, checkpoint/restart, fault tolerance*; E.5. [Data]: Files—*backup/recovery*; H.2.2 [Database Management]: Physical Design—*recovery and restart*; H.2.4 [Database Management]: Systems—*concurrency, transaction processing*; H.2.7 [Database Management]: Database Administration—*logging and recovery*

General Terms: Algorithms, Design, Performance, Reliability

Additional Key Words and Phrases: Buffer management, latching, locking, space management, write-ahead logging

1. INTRODUCTION

In this section, first we introduce some basic concepts relating to recovery, concurrency control, and buffer management, and then we outline the organization of the rest of the paper.

1.1 Logging, Failures, and Recovery Methods

The transaction concept, which is well understood by now, has been around for a long time. It encapsulates the *ACID* (Atomicity, Consistency, Isolation and Durability) properties [36]. The application of the transaction concept is not limited to the database area [6, 17, 22, 23, 30, 39, 40, 51, 74, 88, 90, 101]. Guaranteeing the atomicity and durability of transactions, in the face of concurrent execution of multiple transactions and various failures, is a very important problem in transaction processing. While many methods have been developed in the past to deal with this problem, the assumptions, performance characteristics, and the complexity and ad hoc nature of such methods have not always been acceptable. Solutions to this problem may be judged using several metrics: degree of concurrency supported within a page and across pages, complexity of the resulting logic, space overhead on non-volatile storage and in memory for data and the log, overhead in terms of the number of synchronous and asynchronous I/Os required during restart recovery and normal processing, kinds of functionality supported (partial transaction rollbacks, etc.), amount of processing performed during restart recovery, degree of concurrent processing supported during restart recovery, extent of system-induced transaction rollbacks caused by deadlocks, restrictions placed

EFERENCES

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Prediction Capability of Neural Networks Trained in Monte-Carlo Paradigm

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ABSTRACT

The Monte-Carlo training paradigm for Artificial Neural Networks has been studied, the training short cut to reduce the training time has been discussed, and the prediction capability of such trained neural network has been compared by prediction capability of the statistical approach of the Discriminant Analysis. The Artificial Neural Network trained in Monte-Carlo method proves itself as a reliable prediction tool which is superior to Discriminant Analysis.

Keywords: Prediction Power, Monte-Carlo paradim, Machine Learning, Intillegent Systems, and Neural Networks

INTRODUCTION

A neural network is composed of an input layer, one or more than one hidden layers, and an output layer. Each layer is composed of a set of nodes

REFERENCES

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CALENDAR OF EVENTS

September 7-11
IFIP Congress 1992: 12th World Computer Congress
Madrid, Spain. Sponsor: International Federation for Information Processing. Contact Grupo Geyseco, IFIP '92, Mauricio Legendre 4, BG, E-28046 Madrid, Spain; fax: (+34-1) 3234936; email: ifip@dit.upm.es.

September 8-9
2d European Modula-2 Conference
Leicester, England. Sponsor: Leicester Polytechnic. Contact Sue Brookes, Modula-2, Leicester Polytechnic, Marketing Centre, P.O. Box 143, Leicester LE1 9BH England; (0533) 577098; fax: (0533) 549972.

September 8-10
MDBD-92: Baltic Conference on the Methods of Database Design
Riga, Latvian Republic. Sponsor: FRAME, Ltd. in coop. Baltic Coop. Council, ICM Univ, of Stockholm, and Latvian Academy of Sciences. Contact Boris Cadish, MDBD-92, Perses St., 2, Riga, Latvia, 226400; 211510; fax: (0132) 282524.

September 14-16
DCCA-3, 3d IFIP Working Conference on Dependable Computing for Critical Applications
Mondello (Palermo), Sicily, Italy. Sponsor: IFIP Working Group 10.4. Contact Luca Simoncini, Dipartimento Di Ingegneria dell'Informazione, Univ. of Pisa, Via Diotisalvi 2, 56100 Pisa, Italy; +(39) 50 593443 or 550100; fax: +(39) 554342; email: simon@icnucevm.cnuce.cnr.it.

September 24-25
International Workshop on Object Orientation in Operating Systems IWOOOs '92
Paris, France. Sponsor: Inst. National Recherche en Informatique et Automatique, INRIA, IEEE Technical Workshop on Operating Systems and Application Environments. Contact Roy Campbell, Univ. of Illinois, Dept. of Comp. Sci., 2413 Digital Lab, 1304 W. Springfield Ave., Urbana, IL 61801; (217) 333-3328; email: roy@uiuc.edu.

September 29-October 1
EUROSIM '92: Eurosim Simulation Congress
Capri, Italy. Sponsor: SCSI, CASS, CSSC, CNR Italy. Contact A. DiChiara, Dept. of Civil Engineering, Univ. of Rome "Tor Vergata", via della Ricerca Scientifica, I-00173 Roma, Italy; +39 6 72594575; fax: +39 6 72594586.

September 30-October 2
■ *International Workshop on Hardware-Software Codesign*
Estes Park, Co. Sponsor: SIGDA, SIGSOFT, IEEE-CS, and IEEE-C&CS. Contact Joanne Degroat, Ohio State Univ., 205 Neil Ave., Columbus, OH 43210; email: degroat@ee.eng.ohio-state.edu.

September 30-October 2
13th Annual Allerton Conference on Communication, Control and Computing
Monticello, Ill. Sponsor: Univ. of Illinois at Urbana-Champaign. Contact P. Van Dooren, (217) 333-0656; email: vdooren@uics1.uiuc.edu or M. Spong (217) 333-4281; email: spong@lagrange.cs1.uiuc.edu.

CALL FOR PAPERS

1993 Symposium on Applied Computing (SAC '93)

Indiana Convention Center, Indianapolis, Indiana
Feb 14-16, 1993

SAC '93

SAC '93 is the annual conference of the ACM Special Interest Group on Applied Computing (SIGAPP). For the past seven years, SAC's have been a primary forum for applied computing practitioners and researchers. Again this year, SAC '93 will be held in conjunction with the 1993 ACM Computer Science Conference in Indianapolis. State-of-the-Art and State-of-the-Practice papers in all areas of applied computing are invited including, but not limited to, Artificial Intelligence, Biomedical Informatics, Cognitive Science, Communications, Computational Linguistics, Computational Biology-Chemistry-Physics and Geosciences, Computer Assisted Cooperative Work, Database Design and Engineering, Distributed Systems, Expert Systems, Multimedia, Geographic Information Systems, Graphics and Image Processing, Human/Machine Interfaces, Logic and Symbolic Programming, Molecular Computing, Networking, Neural Networks, Object Oriented Programming, Office Automation, Parallelism, Software Engineering, Software Productivity and Reusability, and Virtual Reality. Proposals for special sessions and panels are also encouraged.

GUIDELINES FOR SUBMISSION

Original papers from any area of applied computing will be considered. Several categories of papers will be considered for presentation and publication: (1) original and unpublished research articles, (2) reports of innovative applications in the arts, sciences, engineering, business, government and industry, and (3) reports of successful technology transfer to new problem domains. Each category of submission will be reviewed by peer groups appropriate to that category. Accepted articles in all categories will be published in the SAC '93 Conference Proceedings to be published by the ACM Press. Best student papers will qualify for awards. Expanded versions of selected papers from all categories will be considered for publication in the ACM/SIGAPP quarterly *Applied Computing Review*.

In order to facilitate the blind external review process, submission guidelines must be strictly adhered to:

- Submit 6 copies of manuscript to SAC '93 Secretariat at address, below.
- Author name(s) and address(es) are NOT to appear in the body of the paper, and self-reference should be in third person.
- Body of paper should not exceed 5,000 words (≈ 20 pages, doublespaced) without prior approval.
- Separate cover sheet should be attached to each copy, containing (1) title, (2) author(s) and affiliation(s), (3) address (including email and fax number) to which correspondence should be addressed, (4) appropriate keywords, (5) abstract not to exceed 250 words, and (6) subject area or relevant track.
- All papers and panel proposals must be submitted by October 1, 1992.

IMPORTANT DATES:

Papers Due: Oct. 1, 1992
Panel Proposals Due: Oct 1, 1992
Author Notification: Nov 15, 1992
Camera Ready Copy: Dec 15, 1992
Conference Begins: Feb. 14, 1993

NOTE: SEND SUBMISSION TO APPROPRIATE TRACK CHAIR TO EXPEDITE PROCESSING. CONTACT SAC'93 SECRETARIAT OR CONFERENCE COORDINATOR FOR FURTHER INFORMATION.

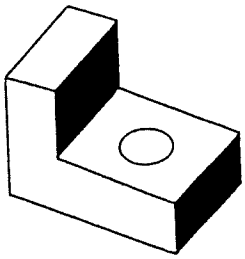
DIRECT CORRESPONDENCE, INQUIRIES, SUBMISSIONS TO:

SAC '93 SECRETARIAT
% Computer Science - MS 219
Oklahoma State University
Stillwater, OK 74078-0599
voice: (1)-405-744-5668
e-mail: SAC93@a.cs.okstate.edu
fax: (1)-405-744-7074

CONFERENCE COORDINATOR
Prof. Edmund Deaton
% Mathematical Sciences
San Diego State University
San Diego, CA 92182
voice: (1)-619-594-5962
e-mail: deaton@cs.sdsu.edu
fax: (1)-619-594-6746

Call for Papers

Montreal, Canada,
May 19-21, 1993



SOLID MODELING '93

SECOND ACM/IEEE SYMPOSIUM ON SOLID MODELING AND APPLICATIONS

This symposium provides an international forum for the exchange of recent research and practical results in all areas and applications of solid modeling. The first symposium in this series, held in June 1991, in Austin, Texas, brought together the the most prominent researchers, key practitioners, and numerous students in this rapidly growing field. Emphasis is on the impact of solid modeling in design and manufacturing, including such topics as

- Geometric and topological domain
- Representation conversion
- Blends, sweeps, offsets
- Algorithmic complexity
- Geometric reasoning
- Interference/clearance analysis
- Hardware support
- User interaction techniques
- Feature-based modeling
- Constraint-based design
- Parametric design
- Assembly modeling
- Product modeling
- Product data exchange
- Manufacturing planning
- Engineering analysis

Papers should be at most 6000 words in length, and should present previously unpublished original results. Please submit abstracts and papers to Mary Johnson at the address listed below. The schedule for submissions is as follows:

September 1, 1992:	Abstract due (150-300 words)
October 15, 1992:	Full papers due (6 copies)
January 7, 1993:	Notice of acceptance & reviewers' comments
February 7, 1993:	Final camera-ready papers due

To receive an advance program, or obtain further information, contact

Mary Johnson
Design Research Center, CII 7015
Rensselaer Polytechnic Institute
Troy, NY 12180-3590

Phone: (518) 276-6751
FAX: (518) 276-2702
E-mail: mjohnson@rdrc.rpi.edu

Co-sponsored by ACM/SIGGRAPH

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CAREER OPPORTUNITIES

The Australian National University

Research School of Physical Sciences and Engineering
Computer Sciences Laboratory
Fellow/Senior Fellow
(Academic Level C/ Academic Level D)

Applications are invited for appointment to a continuing (on probation) research-only position at academic level C or D in the Computer Sciences Laboratory (Head: Professor R. P. Brent, FAA) Research School of Physical Sciences and Engineering.

The Computer Sciences Laboratory is a Department within the Engineering Division of the Research School of Physical Sciences and Engineering, and has close ties to the Department of Computer Science (Faculty of Science) and the Centre for Information Science Research. Current research includes design and analysis of parallel algorithms; software development, software tools and scientific applications on parallel (MIMD and SIMD) computers; aspects of human-machine systems, including speech recognition, speaker characterisation, image analysis and processing. Facilities include access to several parallel machines, including a 128-cell Fujitsu AP1000, a 16384-processor Connection Machine (CM2), a Fujitsu VP2200/10 vector processor, and a 16-node Transputer system.

Applicants should have a strong research record in one of the areas mentioned above, or in a related area of the Computer Sciences. Duties include independent research, supervision of postgraduate students, and involvement in appropriate professional activities.

Enquiries may be made to Professor Brent, telephone (international) 61 6 249 3329, email rpb@cslab.anu.du.au.

Closing date: 31 August 1992 Ref: PSE 20.5.3

Salary: Fellow—$A50,225–$A57,913 pa.; Senior Fellow—$A57,913–$A66,625 pa. (from 23 July 1992).

Appointment: Fellow/Senior Fellow Continuing (on probation).

Applications, clearly quoting reference number, should be submitted in duplicate to the Secretary, The Australian National University, GPO Box 4, Canberra ACT 2601, Australia, including curriculum vitae, list of publications and names of at least three referees. Further information including Selection Criteria is available from the Secretary.

THE UNIVERSITY IS AN EQUAL OPPORTUNITY EMPLOYER

University of Miami

Department of Electrical and Computer Engineering invites applications for a tenure-track faculty position at the Assistant/Associate Professor level. Applicants are expected to have a strong background in computer networks. Qualifications include a Ph.D. degree in computer science or computer engineering, and the ability of initiating research projects, attracting external funding, and teaching undergraduate and graduate courses. Salary will be commensurate with rank and experience. Applications should be sent with the names of three references to: Dr. Tzay Y. Young, Chairman, Dept. of Electrical and Computer Engineering, University of Miami, P.O. Box 248294, Coral Gables, Florida 33124. The University of Miami is an equal opportunity/affirmative action employer.

DEIONDRA WINN '16

Hinesville, Georgia

B.S.Ed. IN EARLY CHILDHOOD EDUCATION

Deiondra Winn always dreamed of becoming a teacher, but it wasn't until she came to Armstrong in 2012 to pursue a B.S.Ed. in Early Childhood Education, that she uncovered a deeper goal—to become a social worker. Fortunately, Armstrong's professors prepared her for life after graduation.

"They have helped instill in me a level of professionalism that some don't acquire until they begin working full-time," she says. "I feel ready to arrive on a job site and succeed."

In addition to her relationships with her professors, Winn feels that one of her most valuable experiences at Armstrong was her participation in the Student Scholars Symposium, an event where university undergraduates present research projects and papers.

"I had a wonderful time," she says. "It was something that I wouldn't have been able to do at another school, since these opportunities are usually reserved for graduate students."

Prepped and confident to manage work at a graduate level, Winn plans to pursue a master's degree in Social Work following graduation.

"Attending Armstrong has been a great opportunity that I'll never take for granted," she says. "It has been a valuable experience and a confidence booster."

THOMAS KAVOORI

India
Economics with IT Certificate
Class of 2015

When Thomas Kavoori moved from his hometown of Hyderabad in South India's Andhra Pradesh region to Savannah, he imagined skyscrapers and bustling city streets.

"When I first came to the United States, I assumed that every single place would look like New York, with people and buildings," he laughs. "I kept telling my friends that I had come to the 'boring' part of America. Now I like it here. It's relaxed, beautiful and the people are great."

Hyderabad is also a center for medical, accounting and computer careers, and growing up there influenced Thomas's interest in economics and information technology. His mother was already in Savannah teaching in the public schools, and he took her colleagues' advice to enroll at Armstrong.

His first foray into economics intimidated him, but department chair Yassaman Saadatmand encouraged him to stick with the challenging coursework.

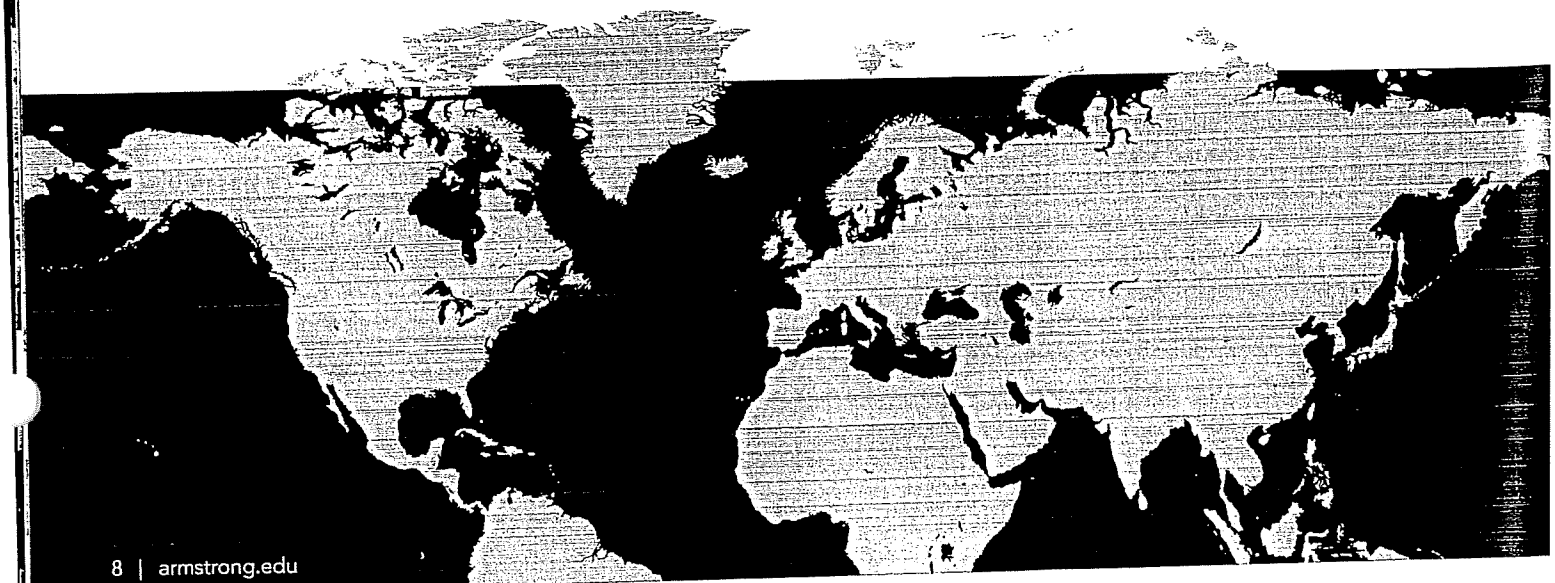
"One day, Saadatmand walked into the classroom and said, 'I don't care how smart you are. What I really care about is your hard work!' That had a big impact on me," he recalls. "After hearing what she had to say, I pushed myself to understand the concepts and, after a while, I fell in love with the subject. I got an 'A' in Economics classes after that."

Thomas calls Armstrong "very conducive to social health" and has found a sense of belonging in the Baptist Collegiate Ministries, where he spends time with students of faith from all over the world and volunteers his time.

After graduation, Thomas plans to work for a large company like Microsoft or to pursue a career in academia. Either way, he wants to pick up a Ph.D. in Economics along the way. Though life might be more bustling in India, he says he couldn't be happier with the quality of his Armstrong experience.

Invoking an all-important term he's learned in his economics classes, he calls Armstrong "a good return on investment."

"I went from 'immigrant introvert Indian student' to an organizational leader within a few years," Thomas says. "It's been a wonderful experience!"



CLARA PEREZ MARCOS

Spain
Economics
Class of 2015

Clara Perez Marcos has been a star player on the women's tennis team at Armstrong since she was a freshman. The bubbly young woman from Madrid, Spain, helped lead the Pirates to national titles in 2012 and 2013. The team finished up last season ranked No. 2 in the nation, and Clara hopes to bring it back to No. 1 in 2015.

Being part of a team sport gave her a ready-made set of friends, but there were still challenges. She got the hang of the language fairly quickly with on-campus tutoring, but mealtimes were especially perplexing. In Spain, lunch is usually served around 2 in the afternoon and dinner as late as 10 p.m. — quite different from the American way.

"Going to another continent is a big risk; you never know what you're going to find," Clara says. "Coming to Savannah, I found nice people trying to help me as much as they could!"

This Spanish athlete plans to take her sharpened language skills into a business internship and then a master's degree program after she graduates. Ultimately, she hopes to work in a sports-related field either in the U.S. or Europe. She's been amazed at the support that Armstrong gives its international students, both financially and emotionally, by providing scholarships and social activities.

"It's a small school, which I like, but there's always so much fun happening," she raves. "I love meeting people from different places all over the world."

MICHELLE BURGHARDT

Germany
Economics
Class of 2015

Michelle Burghardt — an Honors Program student who originally hails from Coesfeld, Germany — loves the fact that she's not just a number at Armstrong.

This Economics major is impressed that professors know her by name and are genuinely interested in helping her achieve her goals.

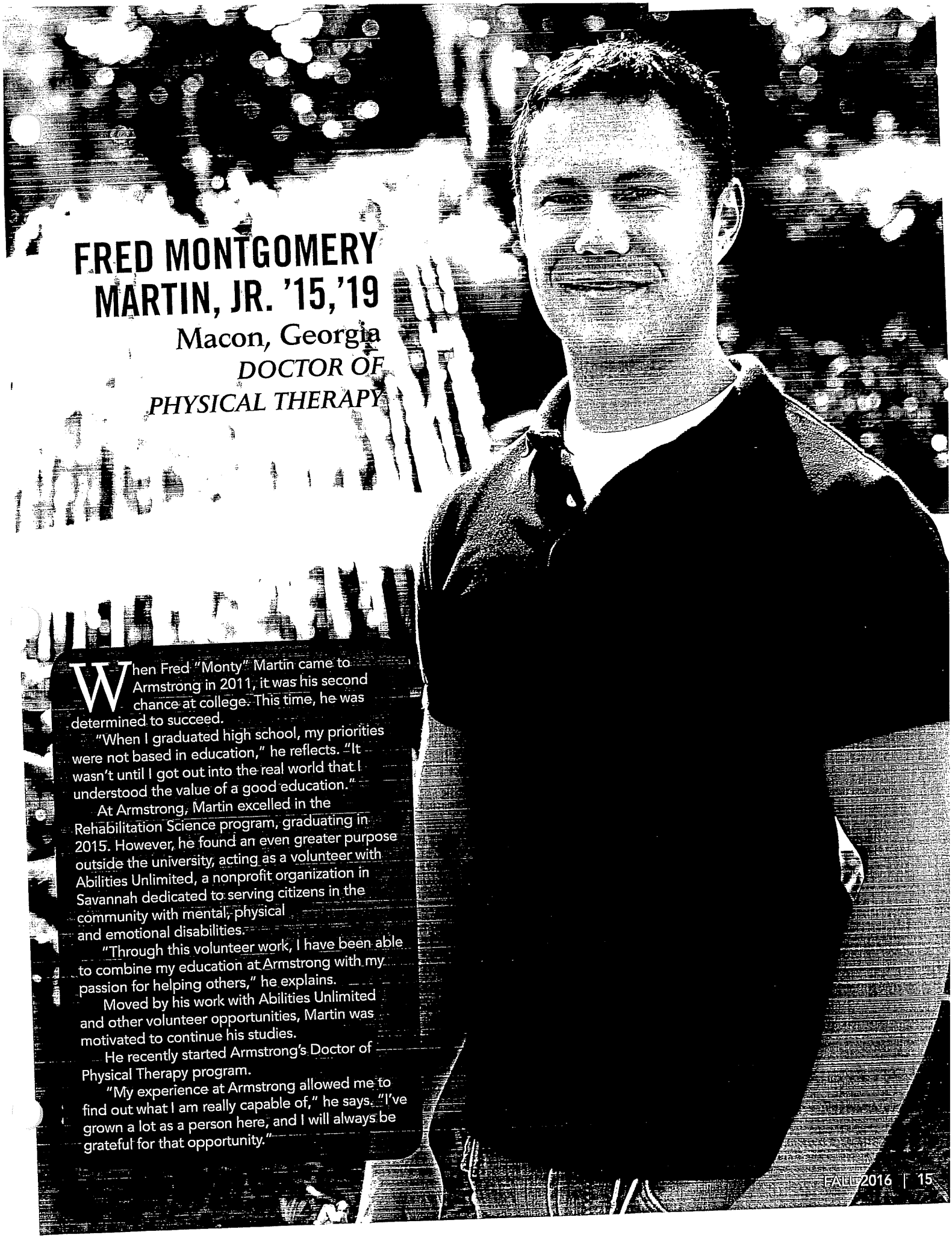
"Armstrong's professors are so accessible to students and always willing to help if you show them that you want to do your part and don't expect to have everything served to you on a silver platter," she says. "At Armstrong, professors are actually concerned with how we are doing, what we want to achieve in life and how they can help us achieve those goals. It's great to feel that they truly care about you."

Since enrolling at Armstrong, Michelle has landed prestigious internships — and golden networking opportunities — with Mercedes in Berlin and the World Trade Center in Savannah. She's a member of the International Student Organization and a graduate of the Nick Mamalakis Emerging Leaders Program.

"I chose Armstrong because it combined all the elements I was looking for in a college: small class sizes and an affordable but excellent education, all in the perfect setting of Savannah, a charming southern city with rich history and proximity to the beach."

She's particularly passionate about economics and is considering enrolling in an MBA program and pursuing a career in business after she graduates from Armstrong.

Michelle currently serves as a research assistant for Armstrong's Economic Monitor, gathering important data about the latest economic trends affecting the Savannah area.



FRED MONTGOMERY MARTIN, JR. '15,'19

Macon, Georgia

DOCTOR OF PHYSICAL THERAPY

When Fred "Monty" Martin came to Armstrong in 2011, it was his second chance at college. This time, he was determined to succeed.

"When I graduated high school, my priorities were not based in education," he reflects. "It wasn't until I got out into the real world that I understood the value of a good education."

At Armstrong, Martin excelled in the Rehabilitation Science program, graduating in 2015. However, he found an even greater purpose outside the university, acting as a volunteer with Abilities Unlimited, a nonprofit organization in Savannah dedicated to serving citizens in the community with mental, physical and emotional disabilities.

"Through this volunteer work, I have been able to combine my education at Armstrong with my passion for helping others," he explains.

Moved by his work with Abilities Unlimited and other volunteer opportunities, Martin was motivated to continue his studies.

He recently started Armstrong's Doctor of Physical Therapy program.

"My experience at Armstrong allowed me to find out what I am really capable of," he says. "I've grown a lot as a person here, and I will always be grateful for that opportunity."

The journal of

Computing For Professionals (CFP)

September 1992
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A Propositional Modal Logic of Time Intervals

JOSEPH Y. HALPERN

IBM Almaden Research Center, San Jose, California

AND

YOAV SHOHAM

Stanford University, Stanford, California

Abstract. In certain areas of artificial intelligence there is need to represent continuous change and to make statements that are interpreted with respect to time intervals rather than time points. To this end, a modal temporal logic based on time intervals is developed, a logic that can be viewed as a generalization of point-based modal temporal logic. Related logics are discussed, an intuitive presentation of the new logic is given, and its formal syntax and semantics are defined. No assumption is made about the underlying nature of time, allowing it to be discrete (such as the natural numbers) or continuous (such as the rationals or the reals), linear or branching, complete (such as the reals), or not (such as the rationals). It is shown, however, that there are formulas in the logic that allow us to distinguish all these situations. A translation of our logic into first-order logic is given, which allows the application of some results on first-order logic to our modal logic. Finally, the difficulty of validity problems for the logic is considered. This turns out to depend critically, and in surprising ways, on our assumptions about time. For example, if our underlying temporal structure is the rationals, then, the validity problem is r.e.-complete; if it is the reals, then validity is Π^1_1-hard; and if it is the natural numbers, then validity is Π^1_1-complete..

Categories and Subject Descriptors: F.2.2 [Analysis of Algorithms and Problem Complexity]: Nonnumerical Algorithms and Problems—*complexity of proof procedures*; F.4.m [Mathematical Logic and Formal Languages]: Miscellaneous; I.2.4 [Artificial Intelligence]: Knowledge Representation Formalisms and Methods—*representation languages*

General Terms: Theory

Additional Key Words and Phrases: Axiomatizability, modal logic, temporal logic, temporal reasoning, time intervals

1. *Introduction*

In at least two areas of Artificial Intelligence, known as *qualitative physics* and *automatic planning*, there is a need for reasoning about continuous processes (such as water filling a slightly leaky container) and having assertions refer to

y Π_1^1-hard. Notice that the Π_1^1-hardness and co-r.e.-hardness results imply
(omatizability.
(lly, we gave several upper bounds for the validity problem. For $\mathcal{N}$, $\mathcal{Q}$,
nd $\mathcal{K}$, we showed that the upper bounds match the lower ones. For $\mathcal{R}$, we
ave a less tight upper bound.

It is surprising that such a natural logic of time has never been explored efore. Many fascinating open problems still remain, and they include the ollowing:

1) Can we find matching upper and lower bounds for the validity problem with respect to $\mathcal{R}$?
2) What results can we get for other natural classes of temporal structures?
3) What happens to the complexity of the validity problem if we slightly modify the logic? We have already remarked that our lower bounds hold even if we restrict the logic to the B, E, and A operators, but we do not know what happens for weaker or incomparable combinations of modal operators, for example, the set $\{D, \overline{D}\}$ or the set $\{B, E\}$.
4) The motivation for our logic was the need to reason about situations of interest in Artificial Intelligence. Are the hardness results for the validity problem a sign of failure? We think not. Our logic is very natural, and the meaning of the various operators is quite intuitive. The fact that an efficient general-purpose theorem prover for the logic is unattainable will hardly come as a shock to anyone in AI. What we need to do, now that we have a natural and expressive logic, is to identify classes of formulas about which reasoning is easier than in the general case.

CKNOWLEDGMENTS. We thank Dana Angluin, Mike Fischer, Yoram Moses, Moshe Vardi, Yde Venema, and especially Johan van Benthem for their comments.

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A Parallel Shortest Augmenting Path Algorithm for the Assignment Problem

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JOSEPH PEKNY
Purdue University

AND

PAOLO TOTH
University of Bologna, Bologna, Italy

Abstract. A parallel version of the shortest augmenting path algorithm for the assignment problem is described. Although generating the initial dual solution and partial assignment in parallel does not require substantive changes in the sequential algorithm, using several augmenting paths in parallel does require a new dual variable recalculation method. The parallel algorithm was tested on a 14-bit processor Butterfly Plus computer, on problems with up to 900 million variables. The speedup obtained increases with problem size. The algorithm was also embedded into a parallel branch and bound procedure for the traveling salesman problem on a directed graph, which was tested on the Butterfly Plus on problems involving up to 30,000 cities.

...pries and Subject Descriptors: C.1.2 [Processor Architectures]: Multiple Data Stream Architectures (Multiprocessors)—*parallel processors*; F.2.1 [Analysis of Algorithms and Problem Complexity]: Numerical Algorithms and Problems—*computation on matrices*; G.1.0 [Numerical Analysis]: General—*parallel algorithms*; G.1.3 [Numerical Analysis]: Numerical Linear Algebra—*sparse and very large systems*; G.1.6 [Numerical Analysis]: Optimization—*linear programming*; G.2.1 [Discrete Mathematics]: Combinatorics—*combinatorial algorithms*; G.2.2 [Discrete Mathematics]:

TABLE VI. SPARSE RANDOMLY GENERATED ATSPs

n	Matrix Density (%)	Execution Time (sec) with Parallel Assignment Algorithm	Execution Time (sec) with Sequential Assignment Algorithm
10000	0.5	363.9	688.8
20000	0.25	1766.8	2823.1
30000	0.17	1432.6	3288.8

a sequential algorithm, but only about 30% of the total time when the AP is solved with our parallel algorithm.

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Developmental Toxicity Risk Assessment : A Rough Sets Approach

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Bloomsburg, PA 17815

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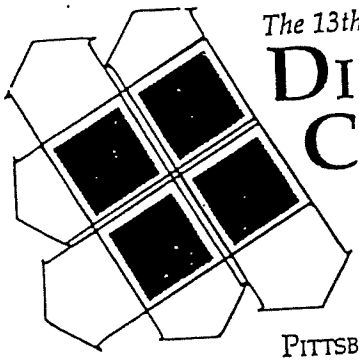

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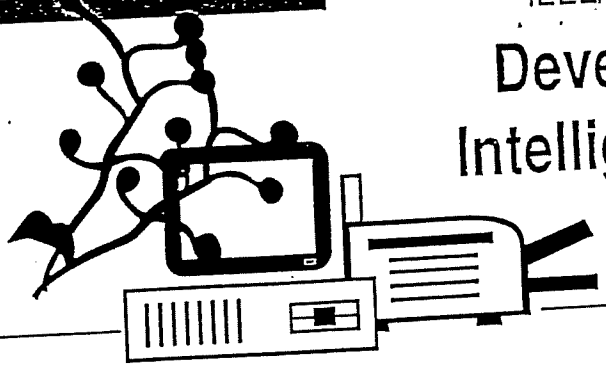

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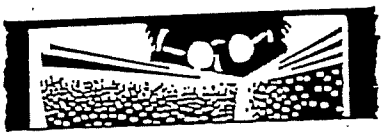
CAREER OPPORTUNITIES

University of Oregon

The Department of Computer and Information Science invites applications for a senior faculty position created by a new state Centers of Excellence award. We are seeking a person who will be an active leader in the department, willing to serve a term as department head and also play a key role in relations to the computer industry. Applicants should have a Ph.D. in computer science or related field and a distinguished record of teaching and research in the area of parallel processing (including parallel architectures, languages, and performance modeling) or human-computer interaction (including computer graphics and scientific visualization). Our department has 14 other research faculty positions (including one other new position for which we are currently recruiting), approximately 20 Ph.D. students, 50 M.S. students, and 150 B.S students. We have strong research programs in parallel and distributed systems, computer graphics, user interfaces, programming languages, software engineering, artificial intelligence, and theoretical computer science, and active interdisciplinary ties with other on-campus groups in the fields of cognitive science, neuroscience, economics, biology, physics, and mathematics. We offer a modern computing environment (a MasPar MP-1100, two Sequent Symmetry multiprocessors, and dozens of Sun and HP workstations) housed in a new computer science building.

Review of applications will continue until the position is filled. The position is available September 1992, with a target date for filling the position by January 1993. Qualified applicants should send their curriculum vitae and the names of at least three references to: Professor John Conery, Faculty Search Committee, Department of Computer and Information Science, University of Oregon, Eugene, OR, 97403-1202. For more information send e-mail to conery@cs.uoregon.edu or phone (503)-346-3973. The University of Oregon is an Equal Opportunity Affirmative Action Employer committed to cultural diversity. We especially encourage applications from women and minorities.



Vassar College

Visiting Assistant Professor in Computer Science

Vassar College is committed to building a strong undergraduate program in Computer Science. We seek applications for a one year visiting appointment in the 1992-93 academic year. Commitment to excellence in undergraduate teaching is expected. The Ph.D. in computer science is required. Candidates must be able to cover courses in the core areas of computer science. We are especially interested in candidates with expertise in graphics, networks, and/or database. Department has laboratory of MacIntoshes for introductory instruction, and MacIntosh and UNIX-based workstation laboratories for intermediate and upper-level courses. Faculty provided with workstations served by the campus network, with access to a cluster of VAXes as well as Bitnet and Internet. Send vita and 3 letters of reference to Nancy M. Ide, Chair, Department of Computer Science, Box 252, Vassar College, Poughkeepsie, NY 12601. AA/EOE. Women and minorities are encouraged to apply.

The University of Alabama

Applications are invited for a tenure track position in the Department of Computer Science at the Assistant Professor level to begin August 16, 1992. The University of Alabama Computer Science Department offers degrees at all levels. Applicants should have broad teaching and research interests within one or more areas of computer science. A Ph.D. in Computer Science is preferred, but applications will be accepted from those with the Ph.D. in a related field and extensive experience in Computer Science. Salary is commensurate with credentials. Applicants should submit a resume and the names of three references to Dr. Hui-Chuan Chen, Department of Computer Science, Box 870290, Tuscaloosa, AL 35487-0290 (Internet inquiries: chen@cs.ua.edu). Review of applications will begin on April 25, 1992 and will continue until the post is filled. The University of Alabama is an equal opportunity/affirmative action employer.

Southern University at Baton Rouge

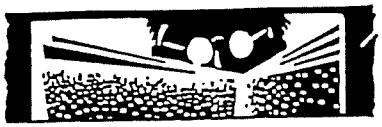
Chairperson
Computer Science Department

The Computer Science Deparument invites applications and nominations for the position of chairperson. Applications must be postmarked by July 1, 1992, and the anticipated starting date is August, 1992.

Applicants for the position should have the earned doctorate in computer science, an established record of research and teaching at both the graduate and undergraduate levels, and demonstrated leadership ability. This is a full-time, nine-month, tenure track position, with an opportunity to work during summer sessions as desired.

The salary is negotiable, depending on rank, experience and other qualifications.

The Computer Science Department has approximately 400 undergraduate majors and 90 graduate students. Degrees offered include the B.S. degree in Computer Science and Computer Information Systems and the M.S. degree in Information Systems, Operating Systems, Mini/Micro Systems, and Educational Computing. The Science Option of the undergraduate program is accredited by the



Computer Science Accrediting Commission of the Computing Sciences Accreditation Board (CSAB). The department has 15 full-time faculty with research interests in networks, database management, software engineering, numerical algorithms and computer science curriculum development.

Computer equipment available in the department includes a VAX 8200, two IBM PC laboratories, and an AT&T 3B2 laboratory. Faculty and students have access to the University's IBM ES/9000 Model 260 and the Computer Science Department and College of Engineering share an IBM 4341.

Southern University at Baton Rouge is an historically Black land-grant college with 9,000 students. The University has nine degree-granting colleges, in addition to the Graduate School. Its campus is situated on bluffs overlooking the majestic Mississippi River in the capitol city of Baton Rouge.

Applications should include a complete resume and three professional references and should be sent to Mrs. Beulah Clark, Chairperson, Computer Science Chair Search Committee, P.O. Box 9221, Southern University, Baton Rouge, LA 70813. For further information, call (504) 771-2060 or Fax (504) 771-4223.

Southern University is an Equal Opportunity Institution.

WEB DEVELOPMENT CORPORATION

WEB Development Corporation invites applications for the position of:

RESEARCH ASSOCIATE

An ideal candidate should have experience in pattern recognition, signal processing or related fields, as well as extensive programming expertise.

A Ph.D. degree in Mathematics, Computer Science or Electrical Engineering is required.

WEB Development is a small research laboratory near Philadelphia whose current activities span computer science, cognitive science, optics and physical chemistry.

Please send resume with two references to:

Dr. Mahmut Gunar
WEB Development Corporation
Longwood Corporate Center South
415 McFarlan Road
Rennett Square, PA 19348

NATIONAL UNIVERSITY OF SINGAPORE

DEPARTMENT OF INFORMATION SYSTEMS AND COMPUTER SCIENCE (DISCS)

Applications are invited for academic positions in the Department. PhD in CS or IS required. Rank and salary will depend on qualifications and experience. Well-qualified applicants in all areas of the subjects will be considered, but research/teaching experience in the following areas are specially sought: systems analysis and design, software engineering, operations research, EDP auditing and financial modelling.

Competitive salary and fringe benefits include: subsidized housing, end-of-contract gratuity (25%), return passage and relocation allowance, children's education allowance, medical benefits and car loan.

Details and application form available from **Director of Personnel, National University of Singapore, 10 Kent Ridge Crescent, Singapore 0511.** For information on the Department write to Head, DISCS, NUS, by post or electronically on **ISCHead @ NUS3090.**

JERRIS SENSABAUGH '16

Morristown, Tennessee

RESPIRATORY THERAPY

Jerris Sensabaugh describes enrolling in Armstrong's accredited respiratory therapy program as one of the easiest decisions he's ever made.

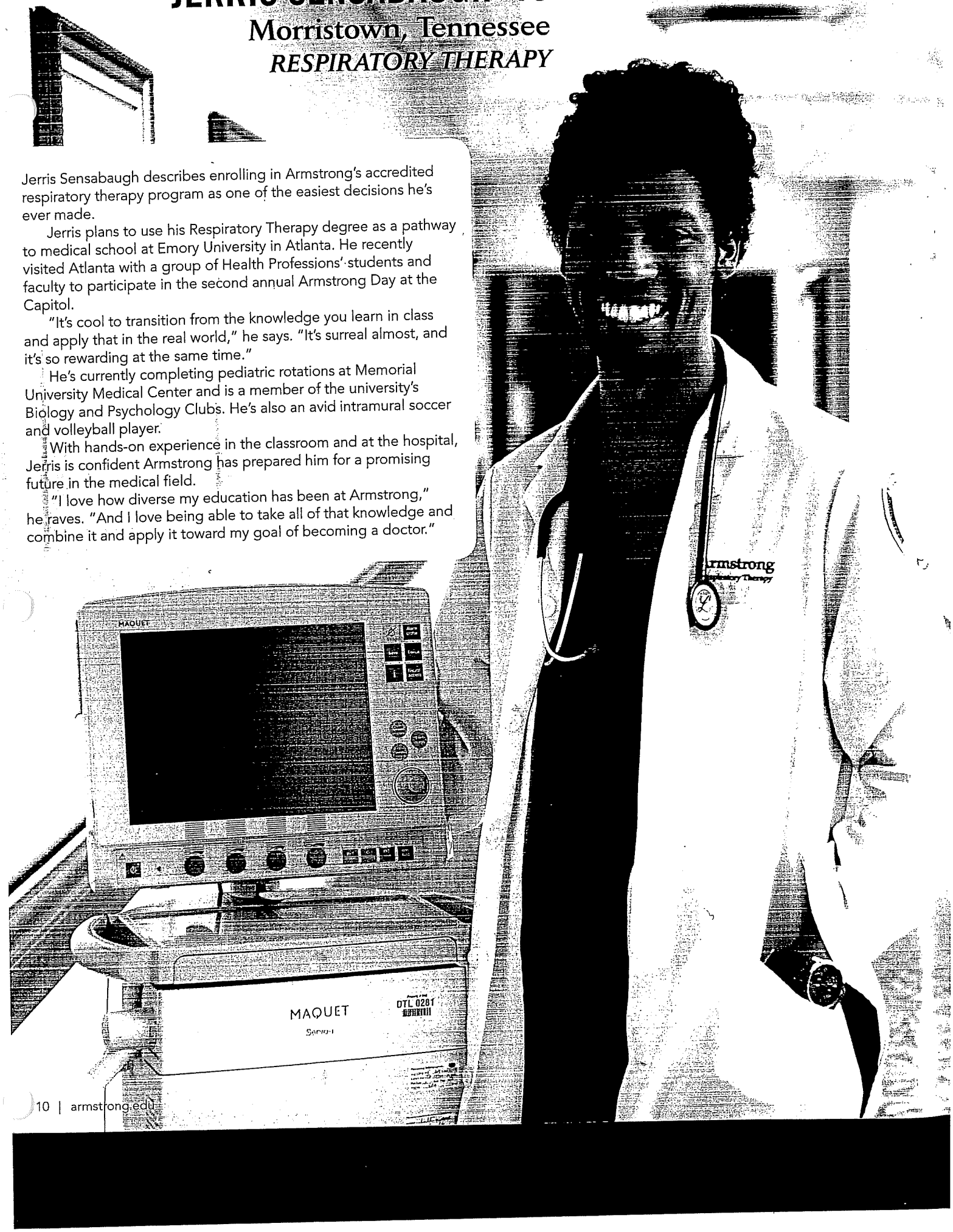
Jerris plans to use his Respiratory Therapy degree as a pathway to medical school at Emory University in Atlanta. He recently visited Atlanta with a group of Health Professions' students and faculty to participate in the second annual Armstrong Day at the Capitol.

"It's cool to transition from the knowledge you learn in class and apply that in the real world," he says. "It's surreal almost, and it's so rewarding at the same time."

He's currently completing pediatric rotations at Memorial University Medical Center and is a member of the university's Biology and Psychology Clubs. He's also an avid intramural soccer and volleyball player.

With hands-on experience in the classroom and at the hospital, Jerris is confident Armstrong has prepared him for a promising future in the medical field.

"I love how diverse my education has been at Armstrong," he raves. "And I love being able to take all of that knowledge and combine it and apply it toward my goal of becoming a doctor."



ASHLEE WILCOX '15

Greenville, South Carolina

COMMUNICATION SCIENCES & DISORDERS

Ashlee Wilcox majored in elementary education at the University of South Carolina, but she decided to pursue a graduate degree in Communication Sciences and Disorders after working with autistic children as a student-teacher.

"I had two autistic boys in my class who went to speech therapy every week," she recalls. "I ended up shadowing the speech therapist at the school and fell in love with the field."

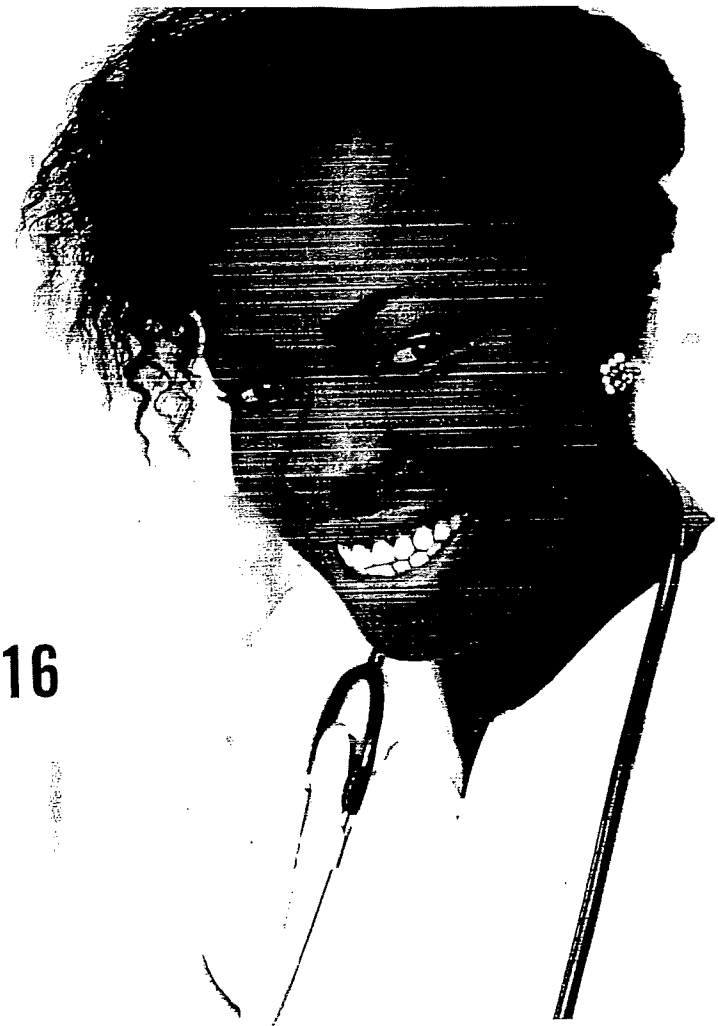
Ashlee chose to pursue her graduate education at Armstrong, in part due to the impressive reputation of the university's communication sciences and disorders program.

"For the Praxis, our national certification test, Armstrong's communication sciences and disorders students had a 100 percent pass rate, which is excellent," she explains.

This hard-working student was also attracted to the small class size, quality learning experiences and hands-on internships at Armstrong. The recipient of a Thomas Spencer McCormick Presidential Scholarship, Ashlee enjoys working with practicing clinicians at the RiteCare Center on Armstrong's campus, providing speech therapy services to area residents.

After graduation, this South Carolina native plans to practice speech-language pathology in Savannah.

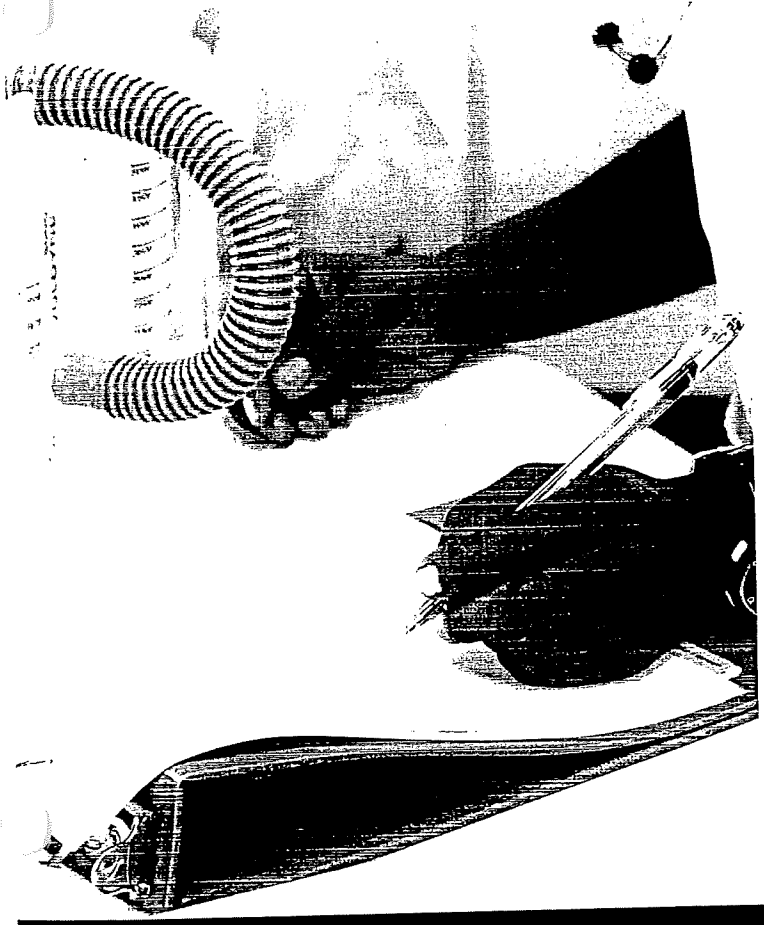
"I'm looking for jobs right now," she says. "Ideally, I'd like to work in a medical setting helping adults recover after a stroke. Armstrong's College of Health Professions has definitely prepared me for success."



FREDA FOSU '16

Kumasi, Ghana

NURSING



Freda Fosu has come a long way from home to study nursing. Born and raised in Kumasi, Ghana, this dedicated student has found the inspiration she needed at Armstrong to pursue her dreams.

"The nursing program at Armstrong gives hope to students like myself," she says.

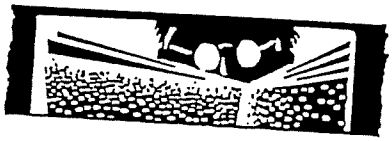
Fosu came to Armstrong in May of 2014 with impressive accomplishments under her belt. In 2012, she, her twin sister and several friends founded ASEMPAkids, a charity in her home country that donates school supplies to children in rural villages and collects gently used clothing and shoes to provide to orphanages in the area.

"ASEMPA means 'good news' in Twi, the dialect spoken in Ghana," she explains. "We come to bring good news to children."

After graduation, Fosu plans to pass the National Council Licensure Examination (NCLEX) and then travel to Ghana with ASEMPAkids for a month before she returns to the U.S. to work as a registered nurse. In the long-term, she hopes to return to Armstrong to complete her master's degree and become a nurse practitioner.

"I can't wait to take what I have learned in class and apply it in the clinical field," she says. "Armstrong has made me confident that I am definitely pursuing the right path in life."

LOST JOBS



Linfield College
Faculty Position

Linfield College seeks to fill tenure track assistant professor position for fall 1992. Teach variety of undergraduate courses in computing science and business information systems. Required by September 1: Ph. D. in Computing Science, or Ph. D. in related field with either masters in computing science (preferred) or equivalent experience (considered). Teaching experience required, preferably beyond teaching assistant level. Facilities include two Sequent S/27 UNIX systems on InterNet and Ethernet, and labs with Macintosh and DOS PCs. Provide letter of application with teaching and professional interests, current vita, three letters of recommendation sent directly to Linfield, and transcripts of all college and university work, to Dr. Kenneth P. Goodrich, Dean of Faculty, Linfield College, McMinnville, OR 97128. Screening begins April 13. AA/EOE.

Duke University
Dept. of Electrical Engineering

The Deparument of Electrical Engineering at Duke University seeks an experienced candidate for a tenure track or tenured faculty position in the area of computer engineering. The applicant should have a Ph.D., a strong and documented research record, and a dedication to excellence in teaching. We are particularly interested in a person with interests in fault- tolerance and testability, high performance computing, computer networks or VLSI design and CAD tools. Interested persons should send a curriculum vitae and the names, addresses and phone numbers of five references to: Kishor Trivedi, Computer Engineering Search Committee, Department of Electrical Engineering, Duke University, Durham, NC 27706. Duke University is an equal opportunity/affirmative action employer.