NDSU DEPARTMENT OF COMPUTER SCIENCE AND OPERATIONS RESEARCH

ANNUAL REPORT
2003- 2004

Primary Contact:
Dr. Kendall E. Nygard, Chair
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Dr. Sandra Andersen, Assistant Professor
PhD, North Dakota State University, 1996

Dr. Andersen primarily teaches undergraduate courses in programming languages and computer science foundations. She is interested in approaches used in textbooks for teaching computer science, and in software engineering.

Dr. Anne Denton, Assistant Professor
PhD, University of Mainz, Germany 1996

Dr. Denton teaches courses in database management and foundations of computer science. Her research interests include data mining, bioinformatics, course management systems for distance education, and computational physics.

Dr. Xiaojiang (James) Du, Assistant Professor
PhD, University of Maryland, 2003

Dr. Du joined the faculty in the summer of 2004. He teaches courses in comparative programming languages and software engineering. His research program concerns computer networks, network security, and intrusion detection.

Dr. D. Bruce Erickson, Associate Professor and Undergraduate Program Coordinator
PhD, Yale, 1973

Dr. Erickson teaches courses in programming, data structures and data abstraction, discrete mathematics for computer science, files for database systems, and mathematical foundations of programming. As undergraduate program coordinator, Dr. Erickson serves on the undergraduate curriculum committee, advises on transfer course equivalencies, ensures that national accreditation principles are followed, and makes recommendations on scholarship recipients.

Dr. Huirong Fu, Assistant Professor
PhD, Nanyang Technology University, Singapore, 2000

Dr. Fu teaches courses and conducts research in networks, network security, and information assurance. She is also carrying out curriculum development work in networks and related areas.

Dr. Paul Juell, Associate Professor
PhD, Ohio State University, 1981

Dr. Juell is interested in Artificial Intelligence, Multimedia and distance education. He teaches courses in computer graphics, operating systems, and comparative languages. He is working with the use of video conferencing to facilitate partnerships with universities around the world, including synchronous delivery of courses over the internet.

Dr. Ahmed Kamel, Assistant Professor
PhD, Michigan State University, 1994

Dr. Kamel teaches courses in artificial intelligence, programming languages, computer science foundations, operating systems, software agents and assembly language programming. He also coaches the undergraduate programming contest teams. He has applied a variety of artificial intelligence techniques to agricultural management and unmanned air vehicle applications.

Dr. Honglin Li, Assistant Professor
PhD, Ohio State University, 2003

Dr. Li is interested in multi-media systems, including annotation of video information data sources. He teaches courses in computer science foundations and computer engineering, including signal processing.

Dr. Kenneth Magel, Professor
PhD, Brown University, 1977

Dr. Magel teaches a wide variety of courses, including software engineering, programming languages, and social implications of computing. His software engineering research activities explore what makes programming difficult and programs complex. Dr. Magel conducts seminars and courses in in XML, C# and .net technologies. He coordinates the graduate programs in software engineering.

Dr. John Martin, Associate Professor and
Graduate Program Coordinator
PhD, Rice University, 1971

Dr. Martin teaches computer science foundations, theoretical computer science and algorithm analysis.. He is interested in formal languages and automata theory and computational complexity. Dr. wrote the textbook Introduction to Languages and the Theory of Computation, which is widely adopted by universities around the country. He serves as freshman advisor and graduate coordinator for the department.

Dr. Kendall E. Nygard, Professor and Departmental Chair
PhD, Virginia Polytechnic Institute and State University, 1978

Dr. Nygard teaches courses in simulation, social implications of computing, mathematical modeling, network optimization, systems analysis and design, and software testing and maintenance. His research interests include software systems for military mission planning for cooperative control of autonomous aircraft systems, software agents, and geographic information systems (GIS) for school transportation. Primary sponsors of his research are the Air Force and Navy.

Dr. William Perrizo, Engberg Presidential Professor
Ph.D., University of Minnesota, 1972

Dr. Perrizo teaches courses in database systems, bioinformatics, and networks. His research interests include database and information systems, data mining, data warehousing, distributed database systems, bioinformatics, precision agriculture, and remotely sensed data management and visualization. His research has been funded by many federal and private sources. Dr. Perrizo is a co-founder of the worldwide Virtual Conference on Bioinformatics. Dr. Perrizo has served as Interim Dean of Research Administration and Acting Special Assistant to the Vice President for Technology.

Dr. Akram Salah, Associate Professor
PhD, University of Alabama at Birmingham 1985

Dr. Salah is interested in software engineering and database management, and is teaching and developing courses in those areas. He has developed a partnership program with Cairo University under sponsorship of the bi-national Fulbright Commission.

Dr. Brian M. Slator, Professor
Ph.D., New Mexico State University, 1988

Dr. Slator teaches courses in artificial intelligence (AI), multimedia educational systems, computer science problem solving, and comparative languages. His research interests revolve around active environments for learning, including the use of software agents, case-based reasoning, knowledge representation, multimedia systems, distance education, synthetic environments, and multi-user educational games. He is a recipient of the Meier sponsored professorship. Dr. Slator is a recipient of the Ernest L. Boyer International Award for Excellence in Teaching, Learning and Technology

Dr. Vasant Ubhaya, Professor
Ph.D., University of California, Berkeley, 1971

Dr. Ubhaya teaches courses in Discrete Mathematics, Algorithm Analysis, Performance Evaluation, Mathematical Programming, and Dynamic Programming. He does research in Algorithms, Optimization and Approximation, and publishes his results regularly in journals. He is often invited by professional societies to organize and chair sessions, and give talks at their meetings. His research has been supported by the National Science Foundation and EPSCoR.

Dr. Dianxiang Xu
Ph.D., Nanjing University, China, 1995

Dr. Xu is interested in formal methods in software engineering, software agents, and intrusion prevention and detection. He teaches courses in computer science foundations and in software engineering.

LECTURERS

Ms. Dana Johnson, Senior Lecturer
MS, University of Denver, 1980

Ms. Johnson teaches and coordinates the offering of introductory courses in application software (Microsoft Office), programming languages (Visual Basic, COBOL), and online courses in electronic commerce.

**Mr. Pratap Kotala, Lecturer
MS, North Dakota State University, 2002**

Mr. Kotala teaches courses in systems analysis and design and foundations of programming for MIS majors. He has research interests in database management.

**Ms. Janet Olfert, Lecturer
MS, Northeast Louisiana University, 1984**

Ms. Janet Olfert teaches courses in Visual Basic, Business Use of Computers, and Cobol Programming

**Dr. Jingpeng Tang, Research Associate,
Ph. D., North Dakota State University 2002**

Dr. Jingpeng Tang teaches courses in assembly language and computer organization. He has research interests in optimization algorithms, emergent intelligence, and finite element methods.

Professor Elvin Isgrig, Capstone Coordinator

Professor Isgrig is professor emeritus of Industrial and Systems Engineering at North Dakota State University. He is responsible for coordinating externally sponsored capstone projects for computer science seniors. While an Air Force officer, Professor Isgrig was responsible for software development for several major military systems.

STAFF

Lynn Thorp, Information Systems Technician

Carole Huber, Administrative Assistant

Mimi Monson, Part-time Administrative Secretary

Betty Opheim, Part-time Administrative Secretary

I. Goals/accomplishments for the current year

A. INSTRUCTION AND STUDENT SUCCESS

1. _Teaching Initiatives:_

Capstone Project Initiative

During the 2002-03 academic year a major initiative in the area of capstone projects for students was initiated. In years past, the capstone projects were essentially team projects structured within the context of particular courses. Under the new initiative, an effort was made to secure external sponsorship of all capstone projects, and integrate them into CSci 489, Social Implications of Computers. The intent is to develop a stronger culture of scholarship, engagement and integration within capstone projects. During 2003-04, the second year of the initiative, several new corporations sponsored projects, including three carried out remotely from

the Minneapolis-St. Paul area. Twenty projects were sponsored in the spring of 2004. Over one-hundred students actively participated during the Spring Semester. For the first time, MIS and CS students were separated into distinct sections for the course.

The approach of the capstone initiative has the elements outlined below.

(1)　　The students are organized into teams that empower them to demonstrate competency in both functional (vertical) and project (horizontal) organization orientations. The horizontal orientation has a cross-cutting focus that involves technical issues, but also includes exposure to project management, business development, and operations issues. The vertical orientation, as it applies to technical issues, involves development of requirements, software development, and software testing and maintenance. Each team prepares and delivers reports and presentations that are submitted for grades.

(2)　　Client projects with companies and campus units that present real professional challenges are developed. These projects typically involve needs and requirements analysis, conceptual design, and planning for follow-on efforts. Computer-based issues in design and development of products, processes, services, production, and logistical support can be involved. Where it is not possible to complete detailed design in the time available, a plan is prepared for follow-on effort.

(3)　　Students are exposed to project management methodologies, including process definition and guidelines that have become the national (ANSI) and international (ISO) standards. Where feasible, collaboration with student teams from other parallel courses on specific client projects are developed.

I.　　Project teams developed the following report and presentation elements:

a)　Statements of Work written and negotiated with clients and associates.

b)　Needs analysis: Identify and define the new capability for products or services sought by the client or their customer(s).

c)　Requirements analysis: The decomposition of needs into identifiable targets for design, development and planning. Requirements are allocated to system elements, subsystems, and components.

d)　Specification drafts: Documents within a hierarchy that describe the functions, performance levels, limits and restrictions, references to professional standards/specifications, and methods for verifying the achievement of requirements and needs (analysis, test, demonstration, ...). Specifications must satisfy technical and legal standards because they become enforceable in both domains.

e)　Plans: For follow-on detailed design, development and support. These must cover all future effort in terms of a development plan utilizing technical terms

f)　Deliverables: The nature of the venture, time & resources result in a range of deliverable that varies among projects: 1) report of analyses of needs and requirements, 2) plan for follow-on effort, 3) result of design and development (e.g., code, documentation, test results and verifications). All class projects will require 1) and 2) type deliverables. Some lend themselves to 3).

2. *Incorporation of Technology into Courses and Programs:*

CSci 773 (Foundations of the Digital Enterprise) and CSci 774 (Topics in the Digital Enterprise) are entirely web-based distance education offerings. Two sections each of CSci 114 (Microcomputer Applications) and CSci 116 (Business Use of Computers) are taught in a web-based format. An offering of CSci 159 (Computer Science Problem Solving) is being

developed for fully online delivery by Dr. Anne Denton in the fall of 2004. This offering will employ the LON-CAPA course management system and be offered remotely to North Dakota teachers who are interested in enhancing their credentials.

Under Fulbright Sponsorship, a partnership with Cairo University is underway. A video conferencing seminar series has been initiated, with alternating delivery of research seminars by faculty and graduate students from the two sites. This series has stimulated a major expansion of video conferencing activity at Cairo University, and is leading to higher-level partnership activities. Also under this project, a TWIKI site has been established for coordinating student projects with participation from both institutions. The TWIKI system facilitates remote collaboration in multiple ways.

Dr. Brian Slator continues to lead the World-Wide Web Instructional Committee at NDSU, a group focused on the use of technology for learning. Under this project, technology-based delivery of many courses has taken place, including geography and sociology.

The Personal Response System (PRS) was utilized by several professors in several courses to facilitate active learning. Two professors participated in the problem-based learning series.

3. *Adivising Efforts*:

UNDERGRADUATE ADVISEES 2003-2004

D. Bruce Erickson

Iftekhar	Ahmed	Fr	Computer Science
Casey	Chambers	Fr	Computer Science
Paul	Hunt	Fr	Computer Science
Brett	Kingsley	Fr	Computer Science
Dennis	Larson	Fr	Computer Science
Brandon	Martinez	Fr	Computer Science
Brady	Nelson	Fr	Computer Science
Ryan	Patterson	Fr	Computer Science
Matthew	Purland	Fr	Computer Science
Michael	Rothenheber	Fr	Computer Science
Peter	Garcia	Jr	Computer Science
James	Hoff	Jr	Computer Science
Jeremy	Mertz	Jr	Computer Science
Patrick	Tufton	Jr	Computer Science
Matthew	Zeltwanger	Jr	Computer Science
Nathaniel	Froehlich	So	Computer Science
Justin	Gronfur	So	Computer Science
Adam	Helsene	So	Computer Science
Collins	Mutegi	So	Computer Science

James	Peterson Jr	So	Computer Science
Darren	Bjerke	Sr	Computer Science
Rance	Brown	Sr	Computer Science
Daniel	Creswell	Sr	Computer Science
Jeremy	Hackey	Sr	Computer Science
Mark	Haffeman	Sr	Computer Science
Clement	Harambe	Sr	Computer Science
Steve	McGinnity	Sr	Computer Science
Troy	Nelson	Sr	Computer Science
Shannon	Peterson	Sr	Computer Science
Blair	Stelter	Sr	Computer Science
Jonathan	Volske	Sr	Computer Science

Huirong Fu

Ananda	Gurung	Fr	Computer Science
Matthew	Mason	Fr	Computer Science
Chau	Pham	Fr	Computer Science
Alexander	Pratt	Jr	Computer Science
David	Cariveau	So	Computer Science
Linzey	Crockett	So	Computer Science
Alexander	Gayed	So	Computer Science
Travis	Post	So	Computer Science
Long	Tran	So	Computer Science
Peter	Cossette	Sr	Computer Science
Ole	Gjerde	Sr	Computer Science
Luke	Helm	Sr	Computer Science
Joseph	Jaszkowiak	Sr	Computer Science
Martin	Knoll	Sr	Computer Science
Douglas	Nelson	Sr	Computer Science
Kenneth	Paulus	Sr	Computer Science
Vicki	Seaberg	Sr	Computer Science
Nicholaus	Teske	Sr	Computer Science

Paul Juell

Laura	Dallmann	Fr	Pre-MIS
Adam	Duhoux	Fr	Pre-MIS
Brittani	Gadbaw	Fr	Pre-MIS
Nadan	Kulaglic	Fr	Pre-MIS
Tyler	Kummeth	Fr	Pre-MIS
Randall	Schue	Fr	Pre-MIS
Benjamin	Thompson	Fr	Pre-MIS
Joshua	Anderson	Jr	Management Info Systems
Hamza	Baba	Jr	Pre-MIS
Mirela	Bikic	Jr	Pre-MIS
Thomas	Brandt	Jr	Management Info Systems
Justin	Christensen	Jr	Pre-MIS
David	Coon	Jr	Pre-MIS

Randy	Fuchs	Jr	Pre-MIS
Ashley	Rudnick	Jr	Pre-MIS
Josh	Sund	Jr	Pre-MIS
Derek	Kern	So	Pre-MIS
Brennen	Kratky	So	Pre-MIS
John	Urbanec	So	Pre-MIS
Bradley	Arbach	Sr	Management Info Systems
Adam	Fudge	Sr	Management Info Systems
Brian	Gross	Sr	Management Info Systems
Ryan	Heilman	Sr	Pre-MIS
Daniel	Hodgson	Sr	Management Info Systems
Jon	Kitzman	Sr	Computer Science
Andrew	Leapaldt	Sr	Management Info Systems
Joshua	Malnourie	Sr	Management Info Systems
Tim	Oehlke	Sr	Pre-MIS
Reza	Rehman	Sr	Pre-MIS
Brian	Splichal	Sr	Pre-MIS
Brandon	Sunde	Sr	Management Info Systems
Alex	Susag	Sr	Management Info Systems
David	Voecks	Sr	Computer Science
Michael	Zerr	Sr	Management Info Systems

Kenneth Magel

Joseph	Volk	Fr	Computer Science
Thomas	Branca	Jr	Pre-MIS
Jared	Hardy	Jr	Management Info Systems
Joseph	Lindahl	Jr	Computer Science
Joel	Morris	Jr	Pre-MIS
Dane	Eastman	So	Pre-MIS
Dustin	Gustafson	So	Computer Science
James	Volk	So	Pre-MIS
Luke	Brisk	Sr	Pre-MIS
Brian	Daily	Sr	Management Info Systems
Joseph	Duncan	Sr	Computer Science
Dustin	Everson	Sr	Management Info Systems
Jennifer	Heggen	Sr	Computer Science
Dustin	Masset	Sr	Management Info Systems
Alissa	Nelson	Sr	Management Info Systems
Christopher	Nichols	Sr	Computer Science
Mitchell	Peterson	Sr	Management Info Systems
Todd	Richtsmeier	Sr	Management Info Systems
Christopher	Rivard	Sr	Computer Science
Celeste	Schweyen	Sr	Computer Science

John Martin

Mohamed	Abdinasir	Fr	Computer Science
Selvedin	Alic	Fr	Computer Science
Dmitri	Barabanov	Fr	Computer Science
Timothy	Barsness	Fr	Computer Science
David	Boland	Fr	Computer Science
Megan	Bouret	Fr	Computer Science
Nicole	Carmichael	Fr	Computer Science
Kade	Club	Fr	Computer Science
Chris	Debevec	Fr	Computer Science
Brandon	Geffre	Fr	Computer Science
Joseph	Guevara	Fr	Computer Science
Joel	Hartleib	Fr	Computer Science
Avery	Hays	Fr	Computer Science
Francis	Heid	Fr	Computer Science
Jesse	Helfrich	Fr	Computer Science
Joshua	Herner	Fr	Computer Science
Chelsey	Jennings	Fr	Computer Science
Peter	Jothen	Fr	Computer Science
Nicholas	Larson	Fr	Computer Science
Anthony	Lynch	Fr	Computer Science
Benjamin	Mayo	Fr	Computer Science
Andrew	Ming	Fr	Computer Science
Steven	Novotny	Fr	Computer Science
William	Peterson	Fr	Computer Science
Alex	Radermacher	Fr	Computer Science
Kaarin	Schmidt	Fr	Computer Science
David	Schmitz	Fr	Computer Science
Michael	Schnell	Fr	Computer Science
Bradley	Shurts	Fr	Computer Science
Brian	Snyder	Fr	Computer Science
Darin	Swenson	Fr	Computer Science
Jesse	Trana	Fr	Computer Science
Eric	Vosika	Fr	Computer Science
Anthony	Wiese	Fr	Computer Science
Christopher	Forseth	Jr	Computer Science
Kate	Horton	Jr	Computer Science
Ikania	Kaale	Jr	Computer Science
Shaun	Kohanowski	Jr	Computer Science
Tanon	Larson	Jr	Computer Science
Nathan	Olson	Jr	Computer Science
David	Rodriquez	Jr	Computer Science
Zachary	Thurn	Jr	Computer Science
Derek	Wang	Jr	Computer Science
Kenneth	Anderson	So	Computer Science
Noah	Anderson	So	Computer Science
Jasson	Andrade	So	Computer Science
Heather	Arndt	So	Computer Science
Brady	Augeson	So	Computer Science

Patrick	Baskerville	So	Computer Science
David	Blattner	So	Computer Science
Jacob	Boomgaarden	So	Computer Science
David	Catlette	So	Computer Science
Zachariah	Christiansen	So	Computer Science
Jayson	Cofell	So	Computer Science
Jordan	Debilzan	So	Computer Science
Laremy	Depyper	So	Computer Science
Troy	Driscoll	So	Computer Science
Scott	Fisher	So	Computer Science
Paul	Flatt	So	Computer Science
James	Fogel	So	Computer Science
Brian	Gussiaas	So	Computer Science
Randy	Haaland	So	Computer Science
Craig	Johnson	So	Computer Science
Matthew	Koble	So	Computer Science
Michael	Lorentz	So	Computer Science
Matthew	Makosky	So	Computer Science
Jesse	McHugh	So	Computer Science
Benjamin	Mueller	So	Computer Science
Michael	Nordick	So	Computer Science
James	Peterson	So	Computer Science
Aaron	Rosecrans	So	Computer Science
Cordell	Schaff	So	Computer Science
Bradley	Seifert	So	Computer Science
Collin	Wahlund	So	Computer Science
Kyle	Wenzel	So	Computer Science
Jonathan	Albers	Sr	Computer Science
Jared	Allar	Sr	Computer Science
Eric	Anderson	Sr	Computer Science
Wyatt	Bachman	Sr	Computer Science
Pooja	Bhalla	Sr	Computer Science
Jeffrey	Blaufuss	Sr	Computer Science
David	Boll	Sr	Computer Science
Brian	Chizek	Sr	Computer Science
Timothy	Conklin	Sr	Computer Science
Benjamin	Dischinger	Sr	Computer Science
Lee	Duncan	Sr	Computer Science
Paul	Fritz	Sr	Computer Science
Ryan	Griggs	Sr	Computer Science
Brenda	Hamilton	Sr	Computer Science
Daniel	Hamre	Sr	Computer Science
Andrew	Horning	Sr	Computer Science
Eric	Hughes	Sr	Computer Science
Christopher	Imdieke	Sr	Computer Science
Jason	Kadrmas	Sr	Computer Science
James	Karg	Sr	Computer Science
Dustin	Kittelson	Sr	Computer Science
Ryan	Kranitz	Sr	Computer Science
Travis	Kroh	Sr	Computer Science

Nicholas	Kroshus	Sr	Computer Science
Nathan	Maier	Sr	Computer Science
Chad	Mitchell	Sr	Computer Science
Ryan	Moen	Sr	Computer Science
Kiyochika	Nakamura	Sr	Computer Science
Nguyen	Nguyen	Sr	Computer Science
Robert	Parsons	Sr	Computer Science
Derek	Pedersen	Sr	Computer Science
Douglas	Plante	Sr	Computer Science
Lynn	Salzsieder	Sr	Computer Science
Jeffrey	Schmidt	Sr	Computer Science
Matthew	Serani	Sr	Computer Science
Riley	Verret	Sr	Computer Science
Scott	Vorachek	Sr	Computer Science
Brian	Wacker	Sr	Computer Science
Wallace	Wiest	Sr	Computer Science
Christopher	Wurtz	Sr	Computer Science
Nicholas	Zechmann	Sr	Computer Science

William Perrizo

Brandon	Asker	Fr	Pre-MIS
Tyler	Boeckel	Fr	Pre-MIS
Eric	Brandvik	Fr	Pre-MIS
William	Brandt	Jr	Pre-MIS
Darin	Jacobson	Jr	Pre-MIS
Joel	Johnson	Jr	Management Info Systems
Noel	Nyborg	Jr	Pre-MIS
Stephen	Sobiech	Jr	Pre-MIS
Zachary	Stevens	Jr	Pre-MIS
Melissa	Stotz	Jr	Pre-MIS
Jamie	Weisenberger	Jr	Pre-MIS
Linda	Charlton	So	Pre-MIS
Jeremy	Lee	So	Pre-MIS
Beau	Weber	So	Pre-MIS
Daniel	Biel	Sr	Management Info Systems
Jason	Cherney	Sr	Management Info Systems
Tara	Christianson	Sr	Management Info Systems
Evan	Friesen	Sr	Management Info Systems
Ryan	Grenz	Sr	Management Info Systems
Christopher	Gust	Sr	Management Info Systems
Alison	Heinrich	Sr	Management Info Systems
Donald	Heisler	Sr	Pre-MIS
Troy	Lillehoff	Sr	Management Info Systems
Brian	Lundberg	Sr	Management Info Systems
Jonathan	Marr	Sr	Pre-MIS
Kory	Nogosek	Sr	Management Info Systems
Tyler	Randklev	Sr	Management Info Systems
Mohamed	Sharif	Sr	Management Info Systems

Troy	Slag	Sr	Management Info Systems
Samuel	Smerud	Sr	Management Info Systems
Luke	Smith	Sr	Management Info Systems
Luke	Sonstegard	Sr	Pre-MIS
Mark	Timmerman	Sr	Management Info Systems

Akram Salah

Galen	Brewer	Fr	Computer Science
Heather	Haaland	Fr	Computer Science
Florent	Rizzo	Fr	Computer Science
Jeffrey	Bladow	Jr	Computer Science
Ryan	Harmon	Jr	Computer Science
Christopher	Hudson	Jr	Computer Science
David	Lorenz	Jr	Computer Science
Jennifer	Lundstrom	Jr	Computer Science
Mitchell	Statz	Jr	Computer Science
Jacob	Welch	Jr	Computer Science
Alyn	Abbott	So	Computer Science
James	Geyer	So	Computer Science
W	Cade	Sr	Computer Science
Christopher	Carroll	Sr	Computer Science
Joshua	Hest	Sr	Computer Science
Anthony	Kramer	Sr	Computer Science
Daniel	Schwartz	Sr	Computer Science
Tyler	Torgrimson	Sr	Computer Science
David	Voskuil	Sr	Computer Science
Chad	Woinarowicz	Sr	Computer Science

Brian Slator

Saul	Carlson	Fr	Computer Science
Thomas	Berry	Jr	Computer Science
Ronald	Beyer	Jr	Computer Science
John	Ell	Jr	Computer Science
Harry	Hight	Jr	Computer Science
Douglas	Kuvaas	Jr	Computer Science
Charles	Peterson	Jr	Computer Science
Justin	Pribula	Jr	Computer Science
Mohamed	Elmaraghy	So	Computer Science
Charles	Fangsrud	So	Computer Science
Neil	Reisenauer	So	Computer Science
Savoeurn	Va	So	Computer Science
Richard	Frovarp	Sr	Computer Science
Nicholas	Hetland	Sr	Computer Science
Randolph	Matz	Sr	Computer Science
Douglas	Worner	Sr	Computer Science

Vasant Ubhaya

Logan	Heinrich	Fr	Computer Science
Dustin	Knudson	Fr	Computer Science
Daniel	MacDonald	Fr	Computer Science
Dusty	Whipple	Fr	Computer Science
Christopher	Heyne	Jr	Computer Science
Frank	Irby	Jr	Computer Science
Raymond	Jamison	Jr	Computer Science
Kyle	Kjorsvik	Jr	Computer Science
Anthony	Pecarina	Jr	Computer Science
Sharif	Rahman	Jr	Computer Science
Matthew	Tompkins	Jr	Computer Science
Ryan	Clemson	So	Computer Science
Daniel	Dalsted	So	Computer Science
Carlton	Hanna	So	Computer Science
Kevin	Ketcher	So	Computer Science
Dong	Lee	So	Computer Science
Michael	Veit	So	Computer Science
Joshua	Wirth	So	Computer Science
Jason	Baker	Sr	Computer Science
Jason	Kamphaugh	Sr	Computer Science
Gregory	Larson	Sr	Computer Science
Robert	Sell	Sr	Computer Science
Mohammad	Vafadar	Sr	Computer Science

4. *Curriculum development including new programs, deletion of programs, administrative changes:*

CSci 732, Introduction to Bioinformatics, was taught for the first time. The course is now cross-listed with mathematics and statistics. Planning for an advanced course connected with the virtual conference in bioinformatics is underway. A graduate program option in bioinformatics is being evaluated and considered. A major event of the 2002-03 academic year was the Fall semester launching of graduate certificate, Master of Science, and Doctor of Philosophy programs in Software Engineering. These programs continue to grow and are highly successful. Four online courses have been submitted for consideration as qualifying credential-establishing courses for North Dakota teachers (CSci 114, 116, 159, and 773). CSci 159 has been submitted for general education approval in the quantitative methods area.   The department is also evaluating a new undergraduate program in an applied area, possibly to replace the Bachelor of Arts program.

5. *Accredition and other reviews:*

National Accreditation in Computer Science was first offered by the Computer Science Accreditation Board in 1985. The B.S. in Computer Science earned national accreditation in the first year, and has held this status continuously ever since. The 2002-03 academic year was a self-study year to prepare for a major accreditation visit in the fall of 2003. A visit by an

evaluation team was hosted in the fall of 2003. A decision on renewal is pending the meeting of the accreditation board. Computer Science accreditation is now managed under ABET, the Accreditation Board for Engineering and Technology. A six-year re-accreditation is the maximum possible for the new term.

6. *Activities in student recruitment/retention, enrollment management, and other student activities:*

Courses taught by graduate teaching assistants have a student evaluation carried out at midsemester as well as at the end, in an effort to identify any teaching problems early enough to make adjustments. New faculty are assigned a mentor to help with their teaching efforts. Enrollment of CS majors continues to decline, which is in accordance with both regional and national trends. This has stimulated discussion of a new applied major at the undergraduate level. At the graduate level, standards for admitting Master of Science students have been increased in an effort to increase the ratio of Ph.D. to Master of Science students. This is proving to be effective, although the number of Master of Science applications continues to be large. A preference in graduate assistantships for Ph.D. students is being followed. The number of Ph.D. students has grown dramatically in the past two years.

7. *Employment of graduates:*

Fall 2003
Graduate Teaching Assistants - 13
Graduate Assistants (Graders) - 18

Spring 2004
Graduate Teaching Assistants - 13
Graduate Assistants (Graders) - 22

8. *Senior professors teaching freshman and transfer students:*

With few exceptions, courses for CS majors are taught by tenure-track professors. Entry level courses are regularly taught by senior professors.

9. *Summer school activities:*

The department typically offers at least two graduate-level courses each summer, including at least one of the four core courses. At least two courses for undergraduate majors are also offered. Service courses, such as CSci 114 and 116 are also offered. The department offers several courses each summer under the self-support program.

B. RESEARCH/SCHOLARSHIPS

1. *Research and scholarly activities:*

Departmental faculty members continue to attract external funding for research. During 2003-04 no major awards were received. However, 2003-04 does mark the fourth year in a row that departmental grant funds in force exceeds $4,000,000. Major sources of funding include the National Science Foundation, Air Force Office of Scientific Research, Office of Naval Research, U. S. Department of Education, and Microsoft Business Solutions. Each research faculty member is expected to regularly apply for external funding. Faculty members regularly publish in refereed journals and other media. Newer faculty hired in the past 1-4 years continue to increase their application rate for funding. The department continues to benefit from the university being a charter member of Internet2 and from connectivity to the National Science Foundation vBNS network. All faculty members have access to the campus ethernet backbone in their offices.

Departmental major areas of research activity include bioinformatics, distributed database management systems, educational technology and synthetic environments, image processing, pattern recognition, subsymbolic artificial intelligence, software engineering, quality assurance in networks, and military applications of operations research. There are approximately one-hundred M.S. students, and forty Ph.D. students. Each research-oriented faculty member has laboratory space in addition to an office. During the summer of 2003, a remodeling and reconfiguring of departmental space was carried out to handle expanded needs for faculty offices and laboratory space. This space is now fully utilized, and the department has a need for additional space.

During 2003-04, the faculty published 77 articles in the open refereed literature. This is a significantly increased and very strong rate of publishing. Some senior faculty continue to publish at high, rates, but the younger faculty are well represented, suggesting that the department is building a stronger base of accomplishment in newer research areas.

2. *Grants/Contracts/Research:*

**COMPUTER SCIENCE DEPARTMENT GRANTS AND CONTRACTS, PART 1
PROJECTS INITIATED PRIOR TO JULY 1, 2003, AND CONTINUING INTO THE 2003-2004 ACADEMIC YEAR**

YEAR	GRANT #	PRINCIPAL INVESTIGATOR	TITLE	FUNDING SOURCE	AMOUNT
5-03 to 6-04	1112	Fu	Securing Wireless Networks: Key Management	Sponsored Programs Admin.	2,750
6/03 to 5/05	4102	Fu	Cyber Security Capacity Building at NDSU	National Science Foundation	199,921
7-1-02 to 4-15-03	4565	Fu	EPSCoR New Faculty Startup Award	EPSCoR	28,200

YEAR	GRANT #	PRINCIPAL INVESTIGATOR	TITLE	FUNDING SOURCE	AMOUNT
9-1-01 to 8-31-04	4576	Kamel	US-Egypt Cooperative Research	National Science Foundation	25,000
6-03 to 6-04	5287	Nygard	Data Development analysis for North Dakota School Transportation	ND Dept of Public Instruction	50,000
5-1-02 to 4-30-05	4871	Nygard	Near Real-time Mission Planning for Autonomous Vehicles	Office of Naval Research	354,829
4-15-01 to 4-14-04	4795	Nygard	Cooperative Control of Multiple Unmanned Autonomous Vehicles	US Air Force AFOSR	345,148
11-20-01 to 11-19-06	4205	Nygard	Virtual Archival Storage Terminal	US Dept. of Housing and Urban Dev.	249,450
7/93 ----	5512	Perrizo	Residual Value Surrogates	Dakota Race Mgmt.	16,469
3/02 -----	1338	Perrizo	Engberg Presidental Award	NDSU	8,100
5/03 to 5/05	4951	Perrizo	Center for High Performance Computing CHPC	General Services Admin.	225,000
3-22-02 to 9-30-04	4251	Perrizo	Virtual Archival Storage Terminal 2002	US General Serv. Adm.	250,000
6-1-01 to 9-30-03	4966	Perrizo	Virtual Archival Storage Terminal 2001	US General Serv. Adm.	498,900
00-05		Slator	Systems for Learning Science and Assessing Student Learning;	NSF-ITR	1,940,000
TOTAL					**$4,193,767**

COMPUTER SCIENCE DEPARTMENT GRANTS AND CONTRACTS
PROJECTS INITIATED DURING THE JULY 1, 2003 TO JUNE 30, 2004 TIME PERIOD

YEAR	GRANT #	PRINCIPAL INVESTIGATOR	TITLE	FUNDING SOURCE	AMOUNT
8-03 to 4/04	4840	Denton	EPSCoR New Faculty Startup	EPSCoR	14,100
2/04 to 1/05	1175	Denton	Research Foundation	NDSU	10,000
7-1-03 to 4-15-04	4565	Fu	EPSCoR New Faculty Startup Award	EPSCoR	28,200
1/04 to 4/04	4858	Li	EPSCoR New Faculty Startup	EPSCoR	4,410
3/04 to 5/05	5287	Nygard	Data Development Analysis for ND School Transportation	ND Dept of Transportation	40,000

YEAR	GRANT #	PRINCIPAL INVESTIGATOR	TITLE	FUNDING SOURCE	AMOUNT
4/04 to 7/04	5365	Nygard	NASA EPSCoR Seed Award	EPSCoR	8,500
12/03	5280	Nygard	Microsoft Business	Microsoft Business Solutions	19,500
1/04 to 6/05	5177	Perrizo	Doctorial Dissertation Award	EPSCoR	19,680
9/03 to 8/04	4759	Perrizo	Development of Diploid Wheat	National Science Foundation	31,260
9/03 to 8/04	4708	Perrizo	Virtual Genomics & Bioinformatics Conference Participant Support	National Science Foundation	9,000
9/03 to 8/04	4707	Perrizo	Virtual Genomics & Bioinformatics Conference Participant Support	National Science Foundation	26,000
3/04 to 6/04		Perrizo	Genomics Conference	EPSCoR	2,700
7-03	5276	Xu	EPSCoR New Faculty Startup	EPSCoR	20,000
Totals					**$233.350**

3. *Articles/Books/Publications and Presentations:*

Anne Denton

Publications

1. Anne Denton and William Perrizo, "A kernel-based semi-naive Bayesian classifier using P-trees," 2004 SIAM Int. Conf. on Data Mining (SDM'04), Lake Buena Vista, FL, April 2004, in print.

2. Anne Denton and William Perrizo, "Decision tree induction for dynamic high-dimensional data using P-trees," 19th Int. Conf. on Computers and Their Applications (CATA'04), Seattle, WA, March 2004, in print.

3. Anne Denton and Paul Juell, "Visualization of Content Information in Networks using GlyphNet," Third International Workshop on Visual Data Mining in conjunction with The Third IEEE International Conference on Data Mining (VDM@ICDM2003), Melbourne, Florida, Nov. 19, 2003.

4. Paul Juell, Vijayakumar Shanmugasundaram, and Anne Denton, "Effectiveness of Visualization for Student Use," World Conference on Educational Multimedia, Hypermedia and Telecommunications (ED-MEDIA'03), Honolulu, Hawaii, USA, June 21-26, 2003.

5. William Perrizo and Anne Denton, "Framework Unifying Association Rule Mining, Clustering, and Classification," CSITeA conference, Rio de Janeiro, Brazil, June 5-7, 2003.

6. William Perrizo, Qin Ding, Anne Denton, Kirk Scott, Qiang Ding, and Maleq Khan, "PINE - Podium Incremental Neighbor Evaluator for Spatial Data Using P-trees," Symposium on Applied Computing (SAC'03), Melbourne, Florida, USA, 2003.

7. Amal Perera, Anne Denton, Pratap Kotala, William Jockheck,Willy Valdivia Granda, and William Perrizo "P-tree Classification of Yeast Gene Deletion Data." SIGKDD Explorations, Vol. 4, Issue 2, January 2003.

Presentations

Presented the paper "Visualization of Content Information in Networks using GlyphNet" at the Third International Workshop on Visual Data Mining in conjunction with The Third IEEE International Conference on Data Mining in Melbourne, Florida, November 19, 2003.

Huirong Fu

Publications

1. Huirong Fu and E. Knightly, "A Simple Model of Real-Time Flow Aggregation," *IEEE/ACM Transactions on Networking,* 11(3), pp. 422-435, June 2003.

2. Huirong Fu and Liren Zhang, "Low Cost Pre-Stored Video Transmission across Networks," *Computer Communications, Elsevier Science*, 26(18), pp. 2061-2069, December 2003.

3. Huirong Fu and Liren Zhang, "Variable Segmentation Scheme Based on Video Characteristics for Dynamic Bandwidth Allocation in Support of Video on Demand Service", *International Journal of Communication Systems*, December 2003.

4. Huirong Fu and Ming Zhang, "On-line Adaptive Firewall Allocation in Internet Data Center," Submitted to *the International Journal of Information Security*.

5. Huirong Fu, "On Parameter Estimation of a Simple Real-Time Flow Aggregation Model," Submitted to *the International Journal of Communication Systems*.

6. Guangyuan Sun and Huirong Fu, "Intrusion Detection Analysis Techniques: Basic Principles, Recent Advances and Open Issues," Submitted to *the IEEE Communications Surveys and Tutorials.*

7. Sanjay Ramaswamy, Huirong Fu, Manohar Sreekantaradhya, John Dixon and Kendall Nygard, "Prevention of Cooperative Black Hole Attack in Wireless Ad Hoc Networks," In Preparation.

Presentations

Sanjay Ramaswamy, Huirong Fu, Manohar Sreekantaradhya, John Dixon and Kendall Nygard, "Prevention of Cooperative Black Hole Attack in Wireless Ad Hoc Networks," the 2003 *International Conference on Wireless Networks (ICWN'03)*, Las Vegas, Nevada, USA, Jun. 2003.

Ming Zhang and Huirong Fu, "OPNET Simulation of Dynamic Firewalls Migration in Internet Data Centers," *OPNETWORK'03*, Washington DC, USA, Aug. 2003.

Guangyuan Sun and Huirong Fu, "Advances on Intrusion Detection Techniques," *CAINE*, Las Vegas, Nevada, USA, Nov. 2003.

Huirong Fu and Liren Zhang, "Video Segmentation for Transporting Pre-Stored Video across Networks," *CAINE*, Las Vegas, Nevada, USA, Nov. 2003.

Huirong Fu and Ming Zhang, "Adaptive Firewall Allocation in Internet Data Center," Submitted.

Paul Juell

Publications

1. Juell, Paul, Amal Perera and Kendall Nygard, Genetic Algorithm to improve a solution for a General Assignment Problem, International Conference on Computer Applications in Industry and Engineering (CAINE03) the Imperial Palace Hotel, Las Vegas, Nevada USA on November 11-13, 2003.

2. Anne Denton and Paul Juell, "Visualization of Content Information in Networks using GlyphNet," Third International Workshop on Visual Data Mining in conjunction with The Third IEEE International Conference on Data Mining (VDM@ICDM2003), Melbourne, Florida, USA, November 19, 2003.

3. Juell, Paul and Patrick Paulson, Using Reinforcement Learning for Similarity Assessment in Case-Based Systems, IEEE Intelligent Systems, Vol. 18, No. 4, July/August 2003, p60-67.

4. Juell, Paul and Manohar Viswanathan, SENSE Crossover Operator for Genetic Algorithm, 7th IASTED International Conference Artificial Intelligence and Soft Computing ASC 2003, July 14-16, Banff, Alberta, Canada, 2003, p239-236.

5. Juell, Paul, Soma Marla and Leonard J. Francl, Using Multiple Nets to Address Noisy Data, 7th IASTED International Conference Artificial Intelligence and Soft Computing ASC 2003, July 14-16, Banff, Alberta, Canada, 2003, p11-14.

6. Juell, Paul and Manohar Sreekantaradhy, Visualization Tool for Student Use in Learning Programming, ED-MEDIA 2003: World Conference on Educational Multimedia, Hypermedia & Telecommunications,
7. June 23-28, Honolulu, Hawaii, 2003.

8. Juell, Paul, Vijayakumar Shanmugasundaram and Anne Denton, Effectiveness of Visualizations for Student Use, ED-MEDIA 2003: World Conference on Educational Multimedia, Hypermedia & Telecommunications, June 23-28, Honolulu, Hawaii, 2003.

9. Juell, Paul and Jasmeet Bhatia, 3D Wizard: A Tool to Easily Build 3D Worlds, MICS2003, The 36th Annual Midwest Instruction and Computing Symposium, (ed) Tom Gibbons, College of St. Scholastica, Duluth, MN, April 11-12, 2003.

Presentations

Juell, Paul and Manohar Viswanathan, SENSE Crossover Operator for Genetic Algorithm, 7th IASTED International Conference Artificial Intelligence and Soft Computing ASC 2003, July 14-16, Banff, Alberta, Canada, 2003, p239-236.

Juell, Paul, Soma Marla and Leonard J. Francl, Using Multiple Nets to Address Noisy Data, 7th IASTED International Conference Artificial Intelligence and Soft Computing ASC 2003, July 14-16, Banff, Alberta, Canada, 2003, p11-14.

Juell, Paul and Manohar Sreekantaradhy, Visualization Tool for Student Use in Learning Programming, ED-MEDIA 2003: World Conference on Educational Multimedia, Hypermedia & Telecommunications, June 23-28, Honolulu, Hawaii, 2003.

Juell, Paul, Vijayakumar Shanmugasundaram and Anne Denton, Effectiveness of Visualizations for Student Use, ED-MEDIA 2003: World Conference on Educational Multimedia, Hypermedia & Telecommunications, June 23-28, Honolulu, Hawaii, 2003.

Juell, Paul and Jasmeet Bhatia, 3D Wizard: A Tool to Easily Build 3D Worlds, MICS2003, The 36th Annual Midwest Instruction and Computing Symposium, (ed) Tom Gibbons, College of St. Scholastica, Duluth, MN, April 11-12, 2003.

Ahmed Kamel

Publications

1. Kamel, Ahmed (2004). An Agent-Based Framework for Agricultural Expert Systems. Fifth International Workshop on Artificial Intelligence in Agriculture, Cairo, Egypt, The International Federation of Automatic Control. March 2004 (Accepted).

2. Kamel, Ahmed, and Deepak Rautela (2003). Software Agents as Data and Information Seekers for Knowledge Based Systems. ISCA 12th International Conference on Intelligent and Adaptive Systems and Software Engineering, San Francisco, California, International Society for Computers and their Applications. July 2003.

3. Hennebry, Michael J., Ahmed Kamel, and Kendall E. Nygard, An Integer Programmng Model for Asssigning Unmanned Air Vehicles to Tasks, in Sergiy Butenko, Robert Murphey and Panos Pardalos, eds., Recent Developments in Cooperative Control and Optimization, Kluwer Academic Publishers, Dordrecht, Netherlands, 2003.

4. Huff, Nathan, Ahmed Kamel, and Kendall Nygard (2003). An Agent Based Framework for Modeling UAV's. ISCA 16th International Conference on Computer Applications in Industry and Engineering, Las Vegas, Nevada. November 2003.

Presentations

Intelligent Agents Research at North Dakota State University, invited presentation at The American University in Cairo, Cairo, Egypt. March 10, 2004.

Tutorial on Intelligent Agents, INFOS 2004 - The Second International Conference on Informatics and Systems, Cairo, Egypt. March 6, 2004.

Honglin Li

Publications

Aijuan Dong, Honglin Li, and Deying Li, Digital Image Processing in Turf Grass Research International Conference on Computing, Communications and Control Technologies: CCCT'04, August 2004, Austin, Texas

Honglin Li, Yi Zhao, and Stan Ahalt, High-level Video Annotations using Syntactic Approach, International Conference on Computing, Communications and Control Technologies: CCCT'04, August 2004, Austin, Texas

Honglin Li, Yi Zhao, and Stan Ahalt, Hierarchical Video Semantic Annotation -- The Vision and Techniques International Conference on Computing, Communications and Control Technologies: CCCT'04, August 2004, Austin, Texas

Yi Zhao, Honglin Li, and Stan Ahalt, Optimized Packet Interleaving for Streaming Applications on Burst-lossy Channels, SPIE DSS 2004, Visual Information Processing XIIII, April 2004, Orlando, Florida

Kendall Nygard

Publications

1. Huff, Nathan, Kamel, Ahmed, and Kendall E. Nygard, An Agent Based Framework for Modeling UAVs, in Proceedings of the 16th International Conference on Computer Applications in Industry and Engineering (CAINE_03), Las Vegas, November, 2003

2. Schesvold, Doug., Tang, Jingpeng.,Ahmed, Benzir Md., Altenburg, Karl, and Nygard, Kendall E., POMDP Planning for High Level UAV Decisions: Search vs. Strike in Proceedings of the 16th International Conference on Computer Applications in Industry and Engineering (CAINE_03), Las Vegas, November, 2003.

3. Juell, Paul, Perera, Amal, and Nygard, Kendall E., Application of a Genetic Algorithm to Improve an Existing Solution for the Generalized Assignment Problem, in Proceedings of the 16th International Conference on Computer Applications in Industry and Engineering (CAINE_03), Las Vegas, November, 2003

4. Joseph Schlecht, Karl Altenburg, Benzir M. Ahmed, and Kendall E. Nygard, Decentralized Search by Unmanned Air Vehicles using Local Communication, 2003 International Conference on Artificial Intelligence, June, 2003.

5. Ramaswamy, Sanjay, Huirong Fu, John Dixon, and Kendall E. Nygard, Prevention of Cooperative Black Hole Attack in Wireless Ad Hoc Networks, 2003 International Conference on Wireless Networks, June, 2003.

6. Chin A. Lua, Karl Altenburg, Kendall E. Nygard, Synchonized Multi-Point Attack by Autonomous Reactive Vehicles with Simple Local Communication, IEEE Swarm Intelligence Symposium, April, 2003

7. Hennebry, Michael, Ahmed Kamel, and Kendall E. Nygard, An Integer Programming Model for Assigning Unmanned Air Vehicles to Tasks, in Recent Developments in Cooperative Control and Optimization, Kluwer publishing, Sergei Butenko and Robert Murphy, Eds, 2004

William Perrizo

Publications

1. "Multimedia Data Mining using Peano Trees", Springer Verlag LNCS#2797, (w grad students) ISBN3-540-20305-2.

2. "Perf. Eval. of Wireless Tactical Networks", IEEE Transactions on Vehicular Technology, Accepted-to appear, (w V. Shi).

3. "Read-Commit Order for Conc. Control in High Perf. DB Systems", Information: Journal, V7:1, pp95-106. (w V. Shi).

4. "Cluster Analysis of Spatial Data Using Peano Count Trees", Information: Journal, V7:1, pp15-26, (with Q. Ding).

5. "DataMIME™", Accepted for ACM SIGMOD 2004, Paris, June 2004. (w grad students).

6. "Efficient Ranking of Keyword Queries Using P-Trees", Accepted for ISCA CATA-04 conf., Seattle. (with grad students).

7. "Kernel-Based Semi-Naïve Bayesian Classifiers", Accepted for SIAM DM04, Lake Buena Vista, FL, (w A. Denton).

8. "Decision Tree Induction for Dynamic, High-Dim Data…", Accepted for ISCA CATA-04 conf., Seattle. (w A. Denton).

9. "Optimized KNN Text Categorization…", Accepted for ACM Symposium App. Comp.04, Cyprus. (w I. Rahal).

10. "Efficient Density Clustering for Spatial Data", ECML PKDD03. (with grad students).

11. "Semi-parametric Regression of Yeast Gene Regulation Prediction", ACS Biotech, New Orleans, 2003. (w grad students).

12. "Integrating Query Processing and Data Mining In Relational DBMSs", ISCA CATA03 Conf. (with grad students).

13. "Finding Predictive Precursors in Time Series Data", ISCA CATA03 Conf. (with W. Jockheck).

14. "Accelerating Multilevel Secure Database Queries…", ISCA CATA03 Conf. (With grad student).

15. "Computing Blocking Prob. in Tactical Comm. Networks", IEEE ICT03, French Polynesia. (with V. Shi).

16. "PINE – Podium Incr. Ngbr Evaluator for Spatial Data", ACM Symposium App. Comp.03, Florida, (with grad students).

17. "Framework Unifying ARM, Clustering, Classification", Int'l CSITeA'03), Rio de Janeiro, June, 2003. (with A. Denton).

18. "On Mining Satellite and Other Remotely Sensed Images", ACM DiSC OnLine Proceedings, March, 2003. (with students).

19. "Density Clustering for Large Spatial Data using Hobbit Rings", European CML Conf.03, Croatia (with grad students).

20. "Digital Archive Net for Anthro. and World Heritage", World Archaeological Congress, 2003. (with J. Clark, et al).

21. "Efficient OLAP Operations for Spatial Data Using Peano Trees", ACM DMKD03, San Diego, (with grad students).

22. "Automatic Face Recognition System using PkNN Classifiers", ICCIT03, Bangeladesh, Dec. 2003. (with H. Kabir).

23. "Lossless Data-mining Ready Image Compression", ICCIT03, Bangeladesh, 03. (with H. Kabir).

24. "Efficient Proximal Support Vector Machine for Spatial Data", ISCA CAINE Conf.03, Las Vegas, (with grad students).

25. "Efficient Frequent Pattern Mining…", ISCA CAINE Conf.03, Las Vegas, (with grad students).

26. "Watermarking Remotely Sensed Images", ISCA CAINE Conf.03, Las Vegas, (with grad students).

27. "Construction of Yeast Protein Interaction Nets", Genome Informatics03, Cold Springs Harbor, NY, (w W. Granda, et al).

28. "P-tree Classification of Yeast Gene Deletion Data", ACM SIGKDD Explorations03 Vol 4, Issue 2. (with grad students).

Presentations

"Data Mining and Data Warehousing of Many-to-Many Relationships and Applications", Invited Plenary Paper at the Int'l Conf. On CS, SE, IT and e-Business and Applications (CSITeA'03), Rio de Janeiro, June, 2003.

Invited Seminar Presentation, "Infinite Storage", ECE Dept., NDSU, Nov. 2003.

Akram Salah

Publications

A. Salah, "Engineering a Technique for Online Course Development," Proceedings of MICS03 (The 36th Midwest Instruction and Computing Symposium) Duluth,MN.

A. Salah, "An Architecture for a Decision-Based Processor, Accepted to be presented in the International Conference on Software Engineering.

Brian Slator

Publications

(1)   Slator, Brian M. Curt Hill, Dayna Del Val (In Press). Teaching Computer Science with Virtual Worlds. IEEE Transactions on Education. New York: IEEE Press.

(2)   Slator, Brian M. (with contributions from 12 others) (In Press). Electric Worlds: role-based virtual environments for education. Teachers College Press. New York: Columbia University

(3)   Slator, Brian M. (2003). Electric Worlds: role-based virtual environments for reeducation (published abstract). Proceedings of the 16th International Conference on Computer Applications in Industry and Engineering (CAINE-03). November 11-13. Las Vegas, NV

(4)   http://csdl.computer.org/comp/proceedings/icalt/2003/1967/00/19670398abs.htmSlat or, B.M., Daniels, L.M., Saini-Eidukat, B., Schwert, D.P., Borchert, O., Hokanson, G., Beckwith, R.T. (2003) Software Tutors for Scaffolding on Planet Oit. In: IEEE International Conference on Advanced Learning Technologies (ICALT-03), July 9-11, Athens, Greece. IEEE Computer Society 2003. 398-409.

(5)   Johnston, Eunice, Aaron Bergstrom, Christina Burns, Gary K. Clambey, Jeffrey T. Clark, Joshua Dorothy, Derrick Eichele, Shawn Fisher, Justin Hawley, Ryan Kranitz, James E. Landrum, III, Sybil Priebe, Brian M. Slator, Douglas Snider, J. Liessman Vantine, and Melissa Zuroff. (2003) Visual or Verbal: Two Approaches to Creating an Immersive Virtual Environment. Proceedings of Web X: A Decade of the World Wide Web – Joint International Conference of the Association for Computers and the Humanities and the Association for Literary and Linguistic Computing. Athens, Georgia, May 29-June 2.

(6)   Borchert, Otto, Aaron Bergstrom, Lisa Brandt, and the Worldwide Web Instructional Committee (2003). Advances in Immersive Virtual Worlds for Science Education. Proceedings of the 36th Midwest Instructional Computing Symposium (MICS): April 11 - 12. College of St. Scholastica, Duluth, MN. Complete author list at http://oit.cs.ndsu.nodak.edu/~mooadmin/saved/MICS/MICS03-Advances.pdf

(7)   Mack, Jessica, Brian M. Slator, Kellee Boulais, Viet Doan, and the students of CS345 (2003). Learning by Earning: The Dollar Bay Project. Proceedings of the 36th Midwest Instructional Computing Symposium (MICS): April 11 - 12. College of St. Scholastica, Duluth, MN. Complete author list at http://oit.cs.ndsu.nodak.edu/~mooadmin/saved/MICS/MICS03-DBay.pdf

[Vasant Ubhaya](#)

Presentations

Presented paper "An Algorithm for Approximation by Quasi-convex Functions on R™" at the International Conference on Advances in Constructive Approximation held in Nashville, Tennessee in May, 2003.

[Dianxiang Xu](#)

Publications

Dianxiang Xu, Richard A. Volz, and Michael S. Miller, "Human-Agent Teamwork for Distributed Team Training", *Proc. of the 15th IEEE International Conference on Tools with Artificial Intelligence (ICTAI03)*, pp.602-607, Sacramento, Nov. 2003.

Yu Zhang, Richard Volz, Dianxiang Xu, and Thomas Ioerger. Observation-Based Proactive Communication in Multi-Agent Teamwork. *Journal of Applied Intelligence*, Conditionally accepted.

Presentations:

Human-Agent Teamwork for Distributed Team Training. ICTAI03.

C. OUTREACH

1. *Professional Service*:

The faculty are quite active in service on program committees for conferences. Dr. Nygard was program chair for the annual CAINE conference in November, 2003. Dr. Perrizo serves on the administrative board for the ISCA organization. The partnership project with Cairo university is high visibility outreach activity that is expected to generate several spinoff activities. The first Ph.D. student from Cairo University is expected to enroll at NDSU in the spring semester of 2005. The department is participating in the partnership program spearheaded by Dr. Suhir Mehta, and will accept upper division undergraduates from India in the fall of 2005.

2. *Alumni Events and other community related activities*:

During the spring semester of 2004, a student project was carried out, in which the alumni web site was significant expanded and upgraded. Alumni are actively registering on the site, including new graduates each semester. This provides a way for alumni to stay in contact with their home department, and to network with each other. The senior capstone projects, sponsored by external corporations, provide service to their operations. There are examples of software developed under these projects being immediately brought into service. The department annually sends a representative to

the local high schools for their career day activities, where they provide a presentation of computer science as a career.

3. *Fund-raising accomplishments and other outreach activities*:

The alumni web site development described above reaches out to alumni, and their donations are now at a level where they are genuinely helpful to the department.

D. SPECIAL INITIATIVES

1. *Cultural diversity*:

The partnerships with universities in Cairo and in India are organized projects that promote cultural diversity. Organizing for student projects carried out jointly with Egyptian students has revealed great cultural differences and social issues in computing. The faculty is very diverse, with representation from the United States (6), Egypt (2), China (4), and India(1).

2. *Affirmative Action/Equal Opportunity*:

For many years the department had no female tenure-track faculty (although there were lecturers). Now the department has two tenure-track professors, one non-tenure professor, and a senior lecturer who are female. These teachers were not hired through a direct affirmative action program, but rather through following equal opportunity principles and offering an open position to the best qualified applicant.

3. *Cooperation programming/interdisciplinary efforts/interinstitutional activities*:

The projects with Egypt and India were mentioned above. We are also in the early stages of establishing a relationship with Nanjing University in China, assisted by our Chinese faculty members. We offer a bioinformatics course which is cross-liested and is required for the interdisciplinary Ph. D. program in genomics. Dr. Perrizo serves on the management committee for that program. In the fall of 2004 remote students will be able to earn variable credits for participation in the Virtual Bioinformatics conference. The MIS program is jointly administered with the College of Business. The department offers three courses that support the minor in web design offered by the Communications Department. Discussions are underway to offer a new information systems minor to serve students who are majoring in Industrial Engineering. Two meetings were held with representatives of institutions in the Red River valley regarding forming a consortium focused on facilitating projects of emerging importance in information technology, such as information assurance and network security. One of the meetings was hosted by the department on the NDSU campus. Articulation agreements were developed in 2003-04 with Bismarck State University and the State College of Science in Wahpeton. The graduate certificate program in the Digital Enterprise has options that require one or more courses from the College of Business.

One departmental research associate has entered into a half-time teaching contract with the University of Minnesota at Crookston.

4. *International activities:*

Described above are the projects with Egypt and India as well as the emerging project with China.

5. *Economic Development Efforts:*

The outreach effort for student capstone projects is under federal sponsorship and was justified on economic development grounds. Some students have been offered permanent jobs in North Dakota through linkages with this program. Funding from the grant has also been used to buy down stipend rates for student interns. Students have been identified to work with Datatic Inc on projects, and discussions are underway to contract with Datatic for software development that would be largely carried out by graduate students. Datatic will be locating a branch office in the NDSU Research Park near term. One faculty member is consulting with Microsoft Business Solutions. The department also participates in the Microsoft Academic Alliance program.

6. *Assessment:*

The department revised outcomes and assessment procedures for the BS degree in 2003-04, to more clearly link outcomes for graduates to outcomes from courses. Survey for assessment purposes were developed for alumni and their employers. The sponsors for student capstone projects were also surveyed. Overall, a major revision to assessment in the department was carried out in 2003-04.

7. *Addressing institutional purposes:*

As articulated in the assessment report, the departmental mission links with the missions of the university and the college.

8. *College/Unit planning functions/activities/accomplishments:*

The department hosts an annual holiday gathering, and a spring gathering to recognize our graduates (at which time each graduate receives a departmental gift). Planning for academic affairs and curricula is typically done through faculty meetings and committees that are formed for special projects. The department is very faculty-driven for planning purposes.

A. DEPARTMENTS FUTURE PLANS PROGRAM STRENTHS

The fundamental strength of the department lies in the rigor of its academic programs. The BS degree, in particular, is by far the most rigorous in the region. Although difficult, the programs are well supported by faculty and open opportunity for our graduates. Major future plans have been basically described elsewhere in the report, but are succinctly summarized as follows:

? In research and at the level of graduate programs, strengthen and expand in network security, information assurance, bioinformatics, and software engineering. Continue to maintain excellence in core areas of computer science.
? At the undergraduate level, seriously consider developing a program which is a more applied alternative to the BS degree in computer science. Such a program might be focused on software engineering or information systems.
? In general, continue to increase the number of Ph.D. students in the department, possibly assisted by reducing the number of Master of Science students.\
? Diversity funding sources
? Continue to foster international programs, such as the ones underway with Egypt and India.

B. DEPARTMENT MAKES USE OF ASSESSMENT DATA IN DECISION MAKING WITH INSTITUTION'S MISSION AND PURPOSE

Significant revisions to assessment outcomes and procedures were made in 2003-04, and likely will influence decision making in the future. However, the department operates in a continuous improvement mode, with assessment procedures constantly influencing curricula and course development.

III. INSTRUCTIONAL PROGRAM, ENROLLMENT AND FTE DATA

Student Credit Hours and FTEs Generated

	1999-2000		2000-2001		2001-2002		2002-2003		2003-2004	
	Credit hours	FTE	Credit hours	FTE	Credit hours	FTE	Credit hours	FTE	Credit hours	FTE
100-200	9176	11.47	8915	11.14	9097	11.37	8159	10.20	7999	10.0
300-400	2343	4.31	3243	5.96	3504	6.44	3279	6.03	2467	4.53
600-700	1279	4.44	1570	5.45	1506	5.23	1502	5.22	1795	6.23
TOTAL	12798	20.22	13728	22.56	14307	23.04	12940	21.44	12261	20.76

SUMMER II SCHEDULE
2003

COURSE HOURS	CLASS TITLE	INSTRUCTOR	STUDENT ENROLL	CREDIT
114	Microcomputer Packages	Dana Johnson	20	3
116	Business Use of Computers	J. Olfert	21	4
122	Programming in Basic	J. Olfert	9	3
160	Computer Science I	B. Erickson	10	4
161	Computer Science II	B. Erickson	9	4
227	Computing Fund. I	P. Kotala	Cancelled	3
228	Computing Fund. II	P. Kotala	Cancelled	3
235	Theoretical Computer Sc. 1	J. Martin	15	3
315	System Analysis & Design	K. Altenburg	20	3
372	Comparative Languages	B. Slator	32	3
373	Assembly Program	A. Kamel	8	3
491	Introduction to Scientific Comp	S. Raha	Cancelled	3
690	Introduction to Scientific Comp	S. Raha	Cancelled	3
713	Software Dev. Process	A. Salah	7	3
717	Software Construction	K. Magel	Cancelled	3
760	Dynamic Programming	V. Ubhaya	7	3
790	Sem/Adv. Topics in Network Security	H. Fu	3	1
790	Sem/Formal Methods in Software Engr.	K. Magel	Cancelled	1
797	Master Paper	Staff	4	R-3
798	Master Thesis	Staff	5	R-10
799	Doctoral Dissertation	Staff	10	R-15

FALL SEMESTER SCHEDULE
2003

COURSE HOURS	CLASS TITLE	INSTRUCTOR	STUDENT ENROLL	CREDIT
114	Microcomputer Packages	A. Dong	59	3
114	Microcomputer Packages	V. Goel	59	3
114	Microcomputer Packages	S. Anugonda	56	3
114	Microcomputer Packages	M. Smadi	51	3
114	Microcomputer Packages	Elzain/Johnson	52	3
114	Microcomputer Packages	Elzain/Johnson	58	3
116	Business Use of Computers	J. Olfert	56	4
116	Business Use of Computers	J. Olfert	62	4
116	Business Use of Computers	S. Rahman	53	4
116	Business Use of Computers	R. Abraham	50	4

116	Business Use of Computers	Bukkapatnam/Olfert	62	4
116	Business Use of Computers	Bukkapatnam/Olfert	62	4
122	Program in BASIC	J. Pauli	40	3
155	Immigration (JAVA)	B. Erickson	4	3
159	CS Problem Solving	J. Patterson	42	3
160	Computer Science I	S. Andersen	15	4
160	Computer Science I	B. Erickson	26	4
160	Computer Science I	J. Martin	38	4
160	Computer Science I	J. Martin	21	4
161	Computer Science II	S. Andersen	6	4
161	Computer Science II	S. Andersen	16	4
172	Intermediate Basic/Visual	D. Johnson	19	3
194	IS/Bus. Computing Techiques	D. Johnson	Cancelled	2
214	Self-Paced C	A. Nath	20	1
222	Discrete Mathematics	B. Erickson	39	3
222	Discrete Mathematics	V. Ubhaya	37	3
227	Computing Fund. I	P. Kotala	36	3
227	Computing Fund. I	P. Kotala	24	3
235	Theoretical CS I	J. Martin	57	3
315	System Anal & Design	G. Robillard	59	3
315	System Anal & Design	P. Kotala	28	3
366	Files/Database System	A. Denton	39	3
366	Files/Database System	A. Denton	19	3
372	Comparative Languages	B. Slator	45	3
372	Comparative Languages	C. Young	24	3
373	Assembly Programming	K. Magel	26	3
426	Intro/Artifical Intelligence	A. Kamel	23	3
453	Linear Program Network	V. Ubhaya	5	3
459	Foundations of Comp. Networks	H. Fu	22	3
474	Operating Systems Conc.	A. Kamel	43	3
474	Operating Systems Conc.	D. Xu	19	3
494	IS/VR Development	B. Slator	1	3
494	IS/Network Security	H. Fu	10	3
494	ISComputers/Soc/Ethical Issues	K. Nygard	2	3
499	ST/Foundations of Digital Enter.	D. Johnson	16	3
499	ST/Principals of Sofware Engr.	A. Salah	5	3
626	Intro/Artifical Intelligence	A. Kamel	3	3
653	Linear Program Network	V. Ubhaya	3	3
659	Foundations of Comp. Networks	H. Fu	13	3
693	Ind. Study/Network Security	H. Fu	27	3
696	ST/Foundations of Digital Enter.	K. Nygard	2	3
708	Foundations of Programming	B. Erickson	22	3
713	Software Engineering I	K. Magel	35	3
715	Software Req. Definition & Anal	A. Salah	22	3
730	Office Information Systems	P. Juell	12	3
765	Intro to Database Systems	Bill Perrizo	38	3

Course	Class Title	Instructor	Student Enroll	Credit
773	Foundations of Digital Enterprise	K. Nygard	15	3
790	Sem/Artifical Intelligence	P. Juell	2	1
790	Sem/ATM	Bill Perrizo	1	1
790	Sem/Database Systems	Bill Perrizo	6	1
790	Sem/Educational Media	B. Slator	1	1
790	Sem/Formal Met/Software Engr	A. Salah	7	1
790	Sem/Intelligent Agents	A. Kamel	3	1
790	Sem/XML.	K. Magel	10	1
793	IS/Software Testing Evidence	K. Magel	1	3
797	Master Paper	Staff	19	R-3
798	Master Thesis	Staff	18	R-10
799	Doctoral Dissertation	Staff	19	R-15

SPRING SEMESTER SCHEDULE
2004

COURSE HOURS	CLASS TITLE	INSTRUCTOR	STUDENT ENROLL	CREDIT
114	Microcomputer Packages	A. Dong	56	3
114	Microcomputer Packages	V. Goel	62	3
114	Microcomputer Packages	P. Pathirana	53	3
114	Microcomputer Packages	H. Mukhami	56	3
114	Microcomputer Packages	Bandaru/Johnson	56	3
114	Microcomputer Packages	Bandaru/Johnson	62	3
116	Business Use of Computers	S. Rahman	60	4
116	Business Use of Computers	J. Olfert	60	4
116	Business Use of Computers	J. Olfert	60	4
116	Business Use of Computers	T. Ubbi	62	4
116	Business Use of Computers	Win/Olfert	68	4
116	Business Use of Computers	Win/Olfert	71	4
122	Program in BASIC	Jeremy Pauli	43	3
125	COBOL Programming	Joshua Pauli	39	3
125	COBOL Programming	J. Olfert	25	3
159	Computer Sc. Problem Solving	J. Patterson	45	3
160	Computer Science I	D. Xu	36	4
160	Computer Science I	H. Li	20	4
161	Computer Science II	S. Andersen	33	4
161	Computer Science II	S. Andersen	Cancelled	4
161	Computer Science II	S. Andersen	22	4
212	Self-Paced C++	A. Nath	24	1
228	Computer Fundamentals	P. Kotala	36	3
228	Computer Fundamentals	P. Kotala	19	3
236	Theoretical CS II	J. Martin	60	3
277	Introduction to UNIX	J. Latimer	11	3
299	System & Server Administration	J. Latimer	9	3

316	System Testing & Maint	M. Smadi	35	3
316	System Testing & Maint	P. Kotala	27	3
345	Topics in Personal Computers	B. Slator	60	3
372	Comparative Languages	B. Erickson	32	3
374	Computer Organization	B. Erickson	31	3
374	Computer Organization	J. Tang	25	3
418	Simulation Models	K. Nygard	13	3
467	Algorithm Analysis	J. Martin	60	3
468	Database Systems Design	A. Salah	31	3
475	Operating Systems Design	P. Juell	11	3
489	Soc. Implications of Computer	K. Magel	43	3
489	Soc. Implications of Computer	S. Andersen	53	3
499	ST/Intelligent Agents	A. Kamel	20	3
499	ST/Foundations of Digital Enterprises	D. Johnson	7	3
618	Simulation Models	K. Nygard	5	3
668	Database Systems Design	A. Salah	9	3
716	Software Design	K. Magel	34	3
718	Software Testing & Debugging	D. Xu	26	3
724	Survey of AI	P. Juell	30	3
741	Algorithm Analysis	V. Ubhaya	6	3
773	Foundations of Digital Enterprise	K. Nygard	25	3
774	Topics of the Digital Enterprise	K. Nygard	20	3
778	Computer Networks	B. Perrizo	13	3
779	Advanced Data Mining	B. Perrizo	16	3
783	Topics/Intelligent Agents	A. Kamel	3	3
783	Topics/Adv. Top. In Network Sec.	H. Fu	9	3
783	Topics/Virtual Environments	B. Slator	5	3
783	Topics/Intro to Bioinformatics	Denton/Ubhaya	21	3
790	Sem/Artificial Intelligence	P. Juell	4	1
790	Sem/ATM	W. Perrizo	2	1
790	Sem/Database Systems	W. Perrrizo	11	1
790	Sem/Education Media	B. Slator	3	1
790	Sem/Formal Methods in Software Engr.	A. Salah	11	1
790	Sem/XML	K. Magel	16	1
790	Sem/Multiagent Cooperation & Teamwork	A. Kamel	6	1
790	Sem/Image & Video Processing	H. Li	4	1
793	IS/Object Orient/Design Pattern	K. Magel	1	1
797	Master Paper	Staff	28	R-3
798	Master Thesis	Staff	18	R-10
799	Doctoral Dissertation	Staff	21	R-15

SUMMER I SCHEDULE
2004

COURSE HOURS	CLASS TITLE	INSTRUCTOR	STUDENT ENROLL	CREDIT
114	Microcomputer Packages	D. Johnson	36	3
160	Computer Science I	B. Erickson	6	4
372	Comparative Languages	B. Slator	23	3
499	Distributed Software Apps/XML	K. Magel	17	3
713	Software Development Process	A. Salah	4	3
760	Dynamic Programming	V. Ubhaya	17	3
790	Sem/Formal Methods in Software Engr.	A. Salah	6	1
797	Master Paper	Staff	6	R-3
798	Master Thesis	Staff	5	R-10
799	Doctoral Dissertation	Staff	22	R-15

SUMMER II SCHEDULE
2004

COURSE HOURS	CLASS TITLE	INSTRUCTOR	STUDENT ENROLL	CREDIT
116	Business Use of Computers	J. Olfert		4
161	Computer Science II	B. Erickson		4
235	Theoretical Computer Sci. I	J. Martin		3
413	Software Engineering	A. Salah		3
489	Social Implications of Computers	A. Kamel		3
689	Social Implications of Computers	A. Kamel		3
708	Foundations of Programming	B. Erickson		3
797	Master Paper	Staff		R-3
798	Master Thesis	Staff		R-10
799	Doctoral Dissertation	Staff		R-15

STUDENT RATING OF INSTRUCTION RESULTS 2003-2004

FALL, 2003 and SPRING 2004

Questions	VG	G	IB	P	VP	OMIT	DEPARTMENT LEVEL Mean	S.D.	#R
100 TO 200 LEVEL									
1. Your satisfaction with the instruction in this course.	28.0	44.1	19.8	9.7	2.2	0.2	3.873	1.013	1799
2. The instructor as a teacher.	30.2	42.7	18.9	5.5	2.6	0.1	3.928	1.042	1801
3. The ability of the instructor to communicate effectively	24.6	37.3	23.9	11.8	2.2	0.1	3.788	1.049	1800

4. The quality of this course	20.7	44.4	25.5	6.9	2.2	0.3	3.756	0.964	1797
5. The fairness of procedures for grading this course.	42.3	43.5	9.8	3.8	0.6	0.0	4.131	0.885	1800
6. Your understanding of the course content.	25.7	48.4	19.3	5.0	1.4	0.2	3.931	0.867	1799
300 TO 400 LEVEL									
1. Your satisfaction with the instruction in this course.	24.3	41.0	17.7	9.4	7.4	0.2	3.873	1.013	1799
2. The instructor as a teacher.	29.9	37.8	15.7	9.0	7.6	0.0	3.928	1.042	1801
3. The ability of the instructor to communicate effectively	25.3	41.4	17.9	9.0	6.4	0.0	3.788	1.049	1800
4. The quality of this course	18.7	41.8	25.3	8.6	5.2	0.4	3.756	0.964	1797
5. The fairness of procedures for grading this course.	26.9	45.0	17.1	7.2	3.8	0.0	4.131	0.885	1800
6. Your understanding of the course content.	19.1	52.2	22.3	4.4	2.0	0.0	3.931	0.867	1799
600 TO 700 LEVEL									
1. Your satisfaction with the instruction in this course.	37.9	44.3	12.0	4.2	1.3	0.3	3.873	1.013	1799
2. The instructor as a teacher.	47.2	37.9	9.7	2.6	2.3	0.3	3.928	1.042	1801
3. The ability of the instructor to communicate effectively	41.4	40.8	13.9	2.3	1.0	0.6	3.788	1.049	1800
4. The quality of this course	31.1	46.3	17.8	3.9	0.6	0.3	3.756	0.964	1797
5. The fairness of procedures for grading this course.	41.1	46.6	10.4	0.3	0.6	1.0	4.131	0.885	1800
6. Your understanding of the course content.	35.3	46.9	13.9	2.6	0.6	0.6	3.931	0.867	1799

GRADUATE STUDENTS 2003-2004

Masters Students:

Akimov, Dmitriy
Anugonda, Sreelatha
Ayyarsamy, Arunprakash
Balakrishnan, Prashanth
Bandaru, Narendra
Beeram, Jagadish
Besemann, Christopher
Borse, Priti
Bukkapatnam, Sharath
Chan, Fung
Cherukuri, Chandrasekhar

Choi, Meegeum
Cosmano, Robert
Cui, Yue
Dhalli, Vamsikrishna
Dimri, Dhananjay
Dixon, John
Dong, Aijuan
Duanmu, Shan
Dutta, Tridib
Elzain, Eltayeb
Erhardt, Eric

Farheen, Swara
Foster, James
Gorla, Vijaya
Grigsby, Kenneth
Habib, MD
Haider, Chowdhury Omar
Helaly, Tanjina
Hetzler, Christopher
Hokanson, Guy Eric
Huck, Jason
Huff, Nathan
Huq, Shamima
Jiang, Yuehong
Kakumanu, Shalini
Kancherla, Sridhar
Kawamura, Satoshi
Khalique, Abu Saleh
Khan, Ezaz
Krile, Terry
Kuck, David
Lee, Michael
Li, Mei
Li, Yuhuan
Malakhov, Vasiliy
Mannepalli, Aditya
Manohar, Radha
Mehto, Vikram
Moses, Joseph
Mugu, Vamshi
Murugaiyan, Elangovan
Nanam-Kumar, Sunil
Namboori, Praveen
Nandula, Aparna

Nanna, Tania
Nath, Anupam
Nelson, Daniel
Njos, Robby
Opgrande, John
Patel, Dharmesh
Patil, Archana
Patterson, Jared
Peng, Ge
Peterson, Jason
Phan, Thiep
Pikalek, Jonathan
Ren, Suqin
Sarker, MD Nuruzzaman
Schlecht, Nem
Shanmugasundaram, Sudhan
Sreekantaradhya, Manohar
Srichinta, Uday
Sun, Guangyuan
Sun, Wei
Sun, Yongliang
Syamala, Ranapratap
Tatta, Vasanth
Vasepalli, Skrikanth
Vendor, Bradley
Virupakshi, Vamsi
Viswanathan, Manohar
Wu, Shanhong
Wu, Weihua
Yang, Peining
Yelupula, Sampath
Zaman, Mahbub
Zhang, Gendong

SOFTWARE ENGINEERING MASTERS

Berseth, Matt
Boyko, Gregory
Debilt, Daniel
Kaliki, Srikanth
Lua, Chin

Nagahawatte, Don
Oberoi, Inderjeet
Saeed, Walid
Srivastava, Arun

PHD STUDENTS:

Abidin, Taufik
Abraham, Rina
Ahmed, Md

Attia, Alaa
Borchert. Otto
Canton, Maria

Ding, Qiang
Dong, Aijuan
Goel, Vivek
Guo, Wenge
Hamer, George
Jockheck, William
Kotala, Pratap
Krebsbach, Stephen
Najadat, Hassan
Nath, Anupam
Naznin, Mahmuda
Pan, Fei

Perera, Amal
Rahal, Imad
Ramaswamy, Sanjay
Ren, Dongmei
Sanchez, Julio
Serazi, MD Masum
Tang, Jingpeng
Wang, Baoying
Yang, Ying
Zhang, Ming
Zhang, Yi
Zhao, Wei

SOFTWARE ENGINEERING PHD

Chan, Fung
Pasupuleti, Satyanarayana
Pauli, Jeremy
Pauli, Joshua
Rahman, MD Najeebur

Robillard, Greg
Satter, Medhi
Smadi, Mohammad
Xu, Weifeng

Computer Science Department Enrollment Data

AY	Enrollment (for term xx1)					Total	Total	Degree		
	1st FR	2nd SO	3rd JR	4th SR	5th SR+	UG	Grad	BS	MS	PhD
2003-2004	82	64	48	86		280	139	108	24	0
2002-2003	96	69	51	91		397	90	110	20	3
2001-2002	127	92	63	106		388	104	113	19	3
2000-2001	142	95	73	96		406	116	70	30	2
1999-2000	133	91	92	63		379	86	61	13	0
1998-1999	100	50	52	78		280	76	31	10	3

Summer Semester, 2003	Degree
Akter, Khandker	Masters
Habib, MD Ahsan	Masters
Pan, Fei	Masters
Rahal, Imad	Masters
Sarker, Md. Rashidul	Masters
Shanmugasundaram, Vijayakumar	Masters
Fall Semester, 2003	**Degree**
Denton, Anne	Masters
Li Yuhuan	Masters
Lu, Baojing	Masters
Mugu, Vamshi	Masters
Peng, Ge	Masters
Pitchairman, Murugan	Masters
Viswanathan, Aruna	Masters
Yu Meng	Masters
Spring Semester, 2004	**Degree**
Akimov, Dmitriy	Masters
Farooq, Mohammad	Masters
Guo, Wenge	Masters
Manohar, Rahda	Masters
Milstry, Dilip	Masters
Muchow, Dale	Masters
Opgrande, John	Masters
Rautela, Deepak	Masters
Sun, Guangyuan	Masters
Viswanathan, Manohar	Masters