NDSU DEPARTMENT OF COMPUTER SCIENCE AND OPERATIONS RESEARCH

ANNUAL REPORT 2002-2003

Primary Contact:
Dr. Kendall E. Nygard, Chair
Kendall.Nygard@ndsu.nodak.edu

In terms of academic programs, the 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. During the fall semester, two students were accepted and enrolled in the Ph. D. program, and 4 more followed in the Spring semester. Accepted applications for Fall 2003 are substantial. These new programs represent the most significant major program initiative in the department since the Ph. D. program in Computer Science was launched in 1986. In addition to the Software Engineering initiative, the Department launched a new certificate program in the Digital Enterprise (electronic commerce). Several graduate students are positioned to earn this certificate during 2003-04. These new programs will be important in positioning the department for positive growth and change into the future. Development of the Digital Enterprise program was funded by the U. S. Department of Education Fund for the Improvement of Post-secondary Education (FIPSE) program. All of the new programs greatly benefited from the work of an external advisory board, an on-campus steering committee, and a coordinator. The Digital Enterprises project and degree programs are joint efforts with the College of Business Administration. To support these new programs, new courses are systematically being launched and new faculty hired. Also related to these projects, the department hired Elvin Isgrig, Professor Emeritus of Industrial Engineering and Management, to work quarter-time during the 2002-03 academic year to help develop student capstone projects and to develop working relationships with external business and industry. A federal grant was secured to buy down the stipend rate paid to student interns working under for these external entities. Additional details are in Section III of this report.

In terms of faculty staffing, Assistant Professor Dr. Huirong Fu was hired in the Fall of 2002. Dr. Fu developed and taught a new upper division/graduate course in Network Security. Drs. Victor Shi and Kevin Van Horn resigned from the faculty effective with the spring of 2003. For fall 2003, Drs. Dianxiang Xu and Anne Denton have been hired as Assistant Professors. Recruiting for a third expansion position is underway. Dr. Karl Altenburg, who filled a full-time appointment as a teaching Assistant Professor in 2001-02, left to assume a new position in the MIS program on campus. Dr. Soumyendu Raha was hired to fill the position vacated by Dr. Altenburg. Mr. Pratap Kotala was hired as a full-time lecturer to replace Anup Dargar, who assumed a faculty position at Dickinson State University.

Departmental productivity in teaching continues to be strong, but incurred a reduction in 2002-03. FTE generation for the year was 21.44, compared with 23.04 in 2001-02 (a record-setting year). The decline follows a six-year trend in which enrollments increased each year.

The Department continues to offer B.A., B.S., M.S. and Ph.D. degrees in Computer Science. Applications and acceptances into the computer science and the new software engineering Ph.D. programs for fall 2003 are very high. A record number of graduate students in the department is anticipated for the fall of 2003. 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. 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.

Two of the tenured faculty members concentrate on teaching and service, and the others are active in both teaching and research. The normal teaching load for faculty with a research program is three courses per year (usually two in one semester and one in the other), but two faculty are teaching four courses per year and some occasionally assume overloads in teaching. Most faculty members teach at both the undergraduate and graduate level each year. There are five to six 1-credit seminar courses, each semester, which are not counted in teaching loads. These seminars are specifically in the research areas of the faculty who lead them. These seminars provide a natural way for graduate students to identify thesis and dissertation research topics in their area of interest. Classes required for the computer science degree programs are taught only by faculty with a Ph. D. degree, and are normally held to an enrollment of forty or less, in accordance with accreditation guidelines.

Departmental faculty members continue to attract significant external funding for research. In 1998-99 funding for new research projects totaled approximately $250,000. In 1999-00 this increased to $644,347. In 2000-01 this increased to $2,971,060, of which $1,940,000 is a five-grant acquired by Dr. Brian Slator and his research team for work in synthetic environments for teaching. In 2002-03 new project funding totals $703,668. Active multi-year projects in 2002-03 that were carried over from previous years totaled $4,023,789. This marks the third 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. 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 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 twenty 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 is being carried out to handle expanded needs for faculty offices and laboratory space.

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 2000

Dr. Fu teaches courses and conducts research in networks and network security. She is also carrying out curriculum development work in networks and related areas.
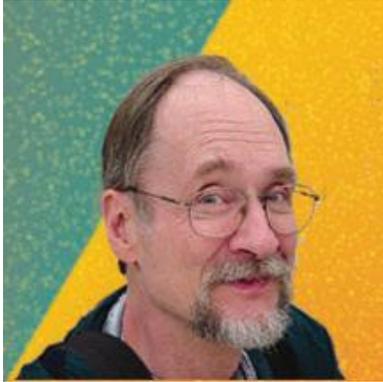
Dr. Paul Juell, Associate Professor
PhD, Ohio State University, 1981

Dr. Juell is interested in Artificial Intelligence and Multimedia for education. He serves as major advisor for large numbers of graduate students. He is working with video conferencing uses in the classroom, including the remote 2000 project for 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, software agents and assembly language programming. He also coaches the undergraduate major programming team, which regularly places well competitions. He has applied a variety of artificial intelligence techniques to management of grain farming operations. He is currently carrying out research in software agent architectures and mission planning for unmanned air vehicles.

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

Dr. Magel teaches in problem solving, software engineering, computer graphics, and programming languages. His software engineering research activities explore what makes

programming difficult and programs complex. He has published widely in the computer science literature. Dr. Magel consults with Great Plains software in XML, C# and .net technologies.

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

Dr. Martin teaches the introductory undergraduate computer science sequence, theoretical computer science, algorithm analysis, and computational complexity. His interests are in theoretical computer science, particularly formal languages and automata theory and computational complexity. He has recently completed a third edition of his textbook, Introduction to Languages and the Theory of Computation, which is part of the McGraw-Hill Series in Computer Science. The book is widely adopted for use in universities around the country. Dr. Martin 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 Nygard's research are the Air Force and Navy. He has served as the faculty representative on the State Board of Higher Education and Presiding Officer of the NDSU University Senate.

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

Dr. Perrizo teaches courses in database systems, simulation, distributed systems, and networks. His research interests include database and information systems, data mining, data warehousing, distributed database systems, ATM networks, optical networks, active networking, precision agriculture, and remotely sensed data management and visualization. Perrizo's research has been funded by the National Science Foundation, Air Force, DARPA, IBM, ATT, Great Plains Software, and NASAt. He has served on over 50 committees at all levels. Perrizo has served as Interim Dean of Research Administration and Acting Special Assistant to the Vice President for Technology.

Dr. Souymendu Raha, Assistant Professor
PhD, University of Minnesota 2000

Dr. Raha is a specialist in scientific computing and modeling of the design of small-scale devices. He teaches courses in computing foundations and scientific computing.

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

Dr. Salah is primarily interested in software engineering, and is teaching and developing courses in that area. He is involved with Microsoft Business Solutions in research and development, and serves as a liaison with that corporation.

Dr. Victor Shi, Assistant Professor
PhD, Peking University, 1996

Dr. Shi is a leading researcher in database management systems and computer networks. He has authored laboratory manuals for networking courses, and is also active in patenting new technologies related to his research.

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 include case-based reasoning in education and performance support, knowledge representation, multimedia systems, distance education, synthetic environments, software agents, and multi-user educational games. Prior to joining NDSU in 1996, he was an AI researcher and project manager at the Institute for the Learning Sciences at Northwestern University. He currently supervises students working in the areas of educational multimedia, synthetic environments, and educational games. At NDSU he is a member of the Worldwide Web Instructional Committee (WWWIC), and the Geology Explorer project (in collaboration with the NDSU Geoscience department). 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.

Kevin Van Horn, Assistant Professor
PhD, Brigham Young University, 1994

Dr. Van Horn teaches courses in Operating Systems, compilers, generic programming and Foundations of Computer Science. Dr. Van Horn's research interests are in mathematical and computational methods for speech recognition.

LECTURERS

Dr. Anne Denton Lecturer
PhD, University of Mainz, Germany 1996

Dr. Denton teaches courses in database management and foundations of computer science. Her research interests include data mining and computational physics.

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

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

Dr. Kuodi Jian, Lecturer
PhD, North Dakota State University, 2002

Dr. Jian teaches courses in systems analysis and design and computer organization.

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 and Lecturer
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.

II. GRANTS, CONTRACTS AND PUBLICATIONS, 2002-2003

**COMPUTER SCIENCE DEPARTMENT GRANTS AND CONTRACTS, PART 1
PROJECTS INITIATED PRIOR TO JULY 1, 2002, AND CONTINUING INTO THE 2002-
2003 ACADEMIC YEAR**

YEAR	GRANT #	PRINCIPAL INVESTIGATOR	TITLE	FUNDING SOURCE	AMOUNT
9-1-01 to 8-31-04	4576	Kamel	US-Egypt Cooperative Research	NSF	25,000
11-20-01 to 11-19-06	4205	Nygard	Virtual Archival Storage Terminal	US Dept. of Housing and Urban Dev.	249,450
4-1-00 to 3-31-03	4585	Nygard	Agent Architectures for Autonomous Combat Air Vehicles	Office of Naval Resarch	343,993
4-15-01 to 4-14-04	4795	Nygard	Cooperative Control of Multiple Unmanned Autonomous Vehicles	US Air Force AFOSR	345,148
5-1-02 to 4-30-05	4871	Nygard	Near Real-time Mission Planning for Autonomous Vehicles	Office of Naval Research	354,829
3-22-02 to 9-30-04	4251	Perrizo	Virtual Archival Storage Terminal 2002	US General Services Admin.	250,000
6-1-01 to 9-30-03	4966	Perrizo	Virtual Archival Storage Terminal 2001	US General Services Admin.	498,900
7/93 ----	5512	Perrizo	Residual Value Surrogates	Dakota Race Mgmt.	16,469
00-05		Slator	Systems for Learning Science and Assessing Student Learning;	NSF-ITR	1,940,000
TOTAL					**$4,023,789**

**COMPUTER SCIENCE DEPARTMENT GRANTS AND CONTRACTS
PART 2
PROJECTS INITIATED DURING THE JULY 1, 2002 TO JUNE 30, 2003 TIME PERIOD**

YEAR	GRANT #	PRINCIPAL INVESTIGATOR	TITLE	FUNDING SOURCE	AMOUNT
1-03		Fu	Faculty Development Instructional Grant	VPAA	1,745

YEAR	GRANT #	PRINCIPAL INVESTIGATOR	TITLE	FUNDING SOURCE	AMOUNT
5-03 to 6-04	1112	Fu	Securing Wireless Networks: Key Management	Sponsored Programs Administration	2,750
7-1-02 to 4-15-03	4565	Fu	EPSCoR New Faculty Startup Award	EPSCoR	28,200
6/03 to	4104	Fu	CyberSecurity Capacity Building at North Dakota State University	National Science Foundation	199,921
11-02		Magel	Rational Rose Software Suite	Rational Corporation SEED Program	75,000
8-02		Magel	Instructional Materials for .NET with C#	Microsoft Business Solutions	58,500
6-03 to 6-04		Nygard	Data envelopment analysis for North Dakota School Transportation	ND Dept of Public Instruction	50,000
9-02 to 12-03	1338	Perrizo	Engberg President Award	NDSU	5,000
10-15-01 to 3-31-03	4790	Perrizo	First Virtual Conference on Genomics and Bioinformatics Participant Support funds	National Science Foundation	20,301
10-15-01 to 3-31-03	4796	Perrizo	First Virtual Conference on Genomics and Bioinformatics	National Science Foundation	37,251
5-19-03 to 5-18-05	4951	Perrizo	Center for High Performance Computing (CHPC)	General Ser. Admin.	225,000
Totals					**$703,668**

FACULTY PUBLICATIONS

Huirong Fu

Papers:

- "A Simple, Practical and Low-Cost Dynamic Segmentation and Bandwidth Allocation Scheme to Transport Pre-Stored Video across Networks", *Submitted* to Journal of Computer Communications, Elsevier, 8/02.
- "Variable Segmentation Based on Intrinsic Video Rate Characteristics to Transport Pre-Stored Video across Networks", *Submitted* to Journal of Computer Communications, Elsevier, 9/02.

- "A Simple Model of Real-Time Flow Aggregation", accepted paper to IEEE/ACM Transactions on Networking, 10/02.
- Ramaswamy, Sanjay, Huirong Fu, John Dixon, and Kendall E. Nygard, Prevention of Cooperative Black Hole Attack in Wireless Ad Hoc Networks, Proceedings of the 2003 International Conference on Wireless Networks, upcoming, June, 2003.

Paul Juell

- Juell, Paul, Elizabeth Smith, Lisa Daniels and Vijayakumar Shanmugasundaram, Learning Objects - Pedagogy Based Structuring of Course Materials, Conference on Advances in Infrastructure for Electronic Business, Science, and Education on the Internet, SSGRR2002, L'Aquila, Italy, July 29 to August 4 2002,
- Juell, Paul and Patrick Paulson, A Non-Linear Distance Metric for Instance-Based Learning, IASTED International Conference on Artificial Intelligence and Soft Computing (ASC 2002), Banff, Canada, July 17 to July 19, 2002.
- Juell, Paul and William Jockheck, Visualizing N Dimensional Clustering, ISCA 17th International Conference on Computers and Their Applications (CATA-2002) to be held April 4-6, 2002 at the Canterbury Hotel, San Francisco, California.

Ahmed Kamel

Publications:
- Dargar, A., A. Kamel, G. Christensen and K. Nygard (2002). An Agent Based Framework for UAV Collaboration. ISCA 11th International Conference on Intelligent Systems, Boston, MA, International Society for Computers and Their Applications (ISCA).
- Guo, W., K. Nygard, H. Qiao and A. Kamel (2002). Multiple Task Allocation Problems with Team Formation. ISCA 11th International Conference on Intelligent Systems, Boston, MA, International Society for Computers and Their Applications (ISCA).
- Hennebry, M., K. Nygard and A. Kamel (2002). An Integer Programming Model for Assigning Unmanned Air Vehicles to Tasks. The 2002 American Control Conference (ACC), Anchorage, Alaska.
- Rautela, D. and A. Kamel (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. Submitted.
- Rautela, D., G. Markwardt and A. Kamel (2002). Combining Open APIs(Parlay/JAIN) & Software Agents for Next Generation Mobile Services. Workshop on M-Services/Concepts, Approaches, and Tools. The 13th International Symposium on Methodologies for Intelligent Systems, Lyon, France.
- Smadi, M. and A. Kamel (2002). A Knowledge-Based Traffic Signal Control Application. ISCA 15th International Conference on Computer Applications in Industry and Engineering, San Diego, California, International Society for Computers and Their Applications (ISCA).

Presentations:
- State of the Art in Research in Intelligent Agents, invited presentation at The American University in Cairo, Cairo, Egypt. June 30, 2002.
- Intelligent Agents Research at North Dakota State University, invited presentation at The American University in Cairo, Cairo, Egypt. July 2, 2002.
- Research in Intelligent Agents, invited presentation at The Central Laboratory for Agricultural

Expert Systems, Ministry of Agriculture, Cairo, Egypt. July 4, 2002.

Kenneth Magel

Publications
- "Comparing Unit Testing Methods", Kenneth Magel, in press, 2003.
- "A Teaching Program for XML and Related Standards", Kenneth Magel, submitted.

John Martin

John C. Martin, *Introduction to Languages and the Theory of Computation*, third edition, McGraw-Hills, 2002

Kendall Nygard

Refereed Abstracts, Expository Articles and Reviews

Nygard, Kendall E., Karl Altenburg, Joseph Schlecht, Chin Lua, Benzir Ahmed, Local Behaviors for Emergent Intelligence in UAV Mission Tactics, in Autonomous Intelligent Networks and Systems Symposium, SRI International, June, 2003

Guo, W., K. Nygard, H. Qiao and A. Kamel (2002). Multiple Task Allocation Problems with Team Formation. ISCA 11th International Conference on Intelligent Systems, Boston, MA, International Society for Computers and Their Applications (ISCA).

Refereed Proceedings

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

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

Hennebry, Michael, Ahmed Kamel, and Kendall E. Nygard, An Integer Progamming Model for Assigning Unmanned Air Vehicles to Tasks, under review for publication in Recent Developments in Cooperative Control and Optimization, Kluwer publishing, Sergei Butenko and Robert Murphy, Eds, 2003.

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

Chandler, P. R., M. Pachter, K. Swaroop, J. Fowler, J. Howlett, S. Rasmussen, C. Schumacher, and K. Nygard, "Complexity in UAV Cooperative Control", Proceedings of the 2002 American Control Conference, Anchorage, 2002

Altenburg, Karl, Joseph Schlecht, and Kendall E. Nygard, "An Agent-based Simulation for Modeling Intelligent Munitions", Proceedings of the WSEAS conference, Skiathos, Greece, September, 2002

Presentations:

- Emergent Intelligence in mission planning for UAVs, U. S. Army Secretary for Science and Technology briefing sessions, UCLA, April, 2003

- Integer Optimization Modeling multiple UAV task Sequencing, Air Force Research Laboratory, Air Vehicles Directorate, January 27, 2003

- Scholar's day luncheon speaker, College of Science and Mathematics, April 27, 2002

William Perrizo

Publications

1. W. Perrizo, Qin. Ding, A. Denton, K. Scott, Qiang Ding, M. Khan, PINE - Podium Incremental Neighbor Evaluator for Spatial Data using Ptrees, ACM SAC 2003.
2. W. Perrizo, A. Denton, Framework Unifying Association Rule Mining, Clustering, and Classification, CSITeA conference in Rio de Janeiro, Brazil, June 5-7, 2003.
3. W. Perrizo, W. Jockheck, A. Perera, D. Ren, W. Wu, Y. Zhang, Multimedia Data Mining Using P-trees, "Data Mining from Multimedia and Complex Data", edited by C. Djeraba, S. Simoff and O. Zaiane, Springer-Verlag, 2003.
4. Q. Ding, W. Perrizo, V. Shi, K. Scott, Integrating Query Processing and Data Mining in Relational DBMSs, ISCA CATA'03, Honolulu, HI, USA March 2003.
5. I. Rahal, W. Perrizo, Query acceleration in Multi-level secure database systems using the P-tree technology, CATA'03, Honolulu, HI, USA, March 2003.
6. B.Wang, F.Pan, D.Ren, Y.Cui, Q. Ding, W.Perrizo, Efficient OLAP Operations for Spatial Data Using Peano Trees, 8th ACM SIGMOD DMKD Workshop, 2003.
7. F. Pan, B. Wang, Y. Zhang, D. Ren, X. Hu, W. Perrizo, Efficient Density Clustering for Spatial Data, ECML PKDD 2003.
8. A. Perera, A. Denton, P. Kotala, W. Jockheck, W. Valdivia-Granda, W. Perrizo, P-tree Classification of Yeast Gene Deletion Data, SIGKDD Explorations, January 2003 Vol 4, Issue 2.
9. W.Perrizo, Q. Ding, A. Denton, Lazy Classifiers Using P-trees, CAINE 2002.
10. W. Perrizo, W. Jockheck, A. Perera, D. Ren, W. Wu, Y. Zhang, Multimedia Data Mining Using Ptrees, MDM/KDD 2002.
11. W. Valdivia-Granda, W. Perrizo, F. Larson, E. Deckard, Ptrees and ARM for gene expression profiling of DNA microarrays, Intl Conference on Bioinformatics, 2002.
12. Q. Ding, M. Khan, A. Roy, W. Perrizo, The P-tree Algebra, ACM SAC'02, Madrid, Spain, March 2002.
13. Qin Ding, Qiang Ding, W. Perrizo, Association Rule Mining on RSI Using Ptrees, PAKDD 2002, Springer-Verlag, LNAI 2336, May 2002.
14. A. Denton, Qiang Ding, W. Perrizo, Qin Ding, Efficient Hierarchical Clustering of Large Data Sets Using P-Trees, CAINE'02, San Diego, Nov. 2002.
15. A. Perera, M. Serazi, W. Perrizo, Performance Improvement for Bayesian Classification with Ptrees, CAINE'02, San Diego, Nov. 2002.
16. M. Khan, Q. Ding, W. Perrizo, K-nearest Neighbor Classification on Spatial Data Streams Using Ptrees, PAKDD'02, Springer-Verlag, LNAI 2336, May, 2002.

17. Qiang Ding, Qin Ding, W. Perrizo. Decision Tree Classification of Spatial Data Streams Using Ptrees, ACM SAC'02, Madrid, March, 2002.

Akram Salah

Publications

Five papers accepted in 2002-03, including papers in MICS 2002 and 2003, the IASTED conference on Software Engineering and Applications 2002, the Egyptian Journal for Computer Science.

Brian Slator

Journal Articles

- Johnston, Eunice, Brian M. Slator, Jeffrey T. Clark, Gary K. Clambey, Shawn Fisher, James E. Landrum III, David Martinson, J. Liessmann Vantine, Justin Hawley, Joshua Dorothy, Tim Rousch (2002). A Historical Virtual Environment for Archeology and Creative Writing Students. Computers in the Social Studies (CSS Journal, electronic educational journal). Volume10 Number 3 July/September.

- Clark, Jeffrey T., Brian M. Slator, William Perrizo, James E. Landrum III, Richard Frovarp, Aaron Bergstrom, Sanjay Ramaswamy, William Jockheck (2002). The Digital Archive Network for Anthropology (DANA), a National Science Digital Library (NSDL) Initiative. Journal of Digital Information (JoDI e-journal), Special issue on Interactivity in Digital Libraries. http://jodi.ecs.soton.ac.uk

- Bernhardt Saini-Eidukat, Donald P. Schwert, and Brian M. Slator. (2002). Geology Explorer: Virtual Geologic Mapping and Interpretation. Journal of Computers and Geosciences. 28(1), 1167-1176.

Conference Proceedings

- Opgrande, John E., Brian M. Slator, Aaron Bergstrom, Phillip McClean, Brad Vender, Alan R. White (2002). Coordinating Pilot Studies for Distributed Learning Environments with Web-based Support Tools. Proceedings of the IASTED International Conference Information and Knowledge Sharing (IKS 2002) November 18-20, 2002 St. Thomas, Virgin Islands, USA

- Regan, Patrick M. and Brian M. Slator (2002). Case-based Tutoring in Virtual Education Environments. Proceeding of the ACM Conference on Collaborative Virtual Environments (CVE-2002). Bonn, Germany. September 30 - October 2

- Clark, Jeffrey T., Brian M. Slator, Aaron Bergstrom, Francis Larson, Richard Frovarp, James E. Landrum III, William Perrizo, William Jockheck. (2002). DANA (Digital Archive Network for Anthropology) A Model for Digital Archiving. Proceedings of the 17th ACM Symposium on Applied Computing (SAC 2002), Special Track on Database and Digital Library Technology. Madrid, Spain, March 10-14, pp. 483-487.

- Clark, Jeffrey T., Aaron Bergstrom, James E. Landrum, III, Francis Larson, and Brian M. Slator. (2002). "Digital Archiving Network, for Anthropology (DANA): three dimensional modeling and database development for internet access", Virtual Archaeology – Proceedings of the VAST2000

Euroconference held in Arezzo, November, 2000. Oxford, Archeopress, edited by Franco Niccolucci. pp. 71-76.

- Slator, B.M., J.T. Clark, L. Daniels, P. McClean, B. Saini-Eidukat, D.P. Schwert, A.R. White, C. Hill. (2002). Immersive virtual environments. Proceedings of the First Annual Beyond Boundaries Conference. September 19-20, 2002. University of North Dakota. Grand Forks, ND.

- Clark, J.T., B.M. Slator, J. Hawley, J.E. Landrum, III., A. Bergstrom, M. Zuroff, E. Johnston, S. Fisher. Virtual archaeology as a teach tool. Computer Applications and Quantitative Methods in Archaeology Conference, CAA. April 2-6, 2002. Heraklion, Crete, Greece.

Book Chapters

- Slator, Brian M., Jeffrey T. Clark, Lisa Daniels, Curt Hill, Phil McClean, Bernhardt Saini-Eidukat, Donald P. Schwert, Alan R. White (2002). Use of Virtual Worlds to Teach the Sciences. Virtual Environments for Teaching and Learning, edited by L. C. Jain, R. J. Howlett, N. S. Ichalkaranje, and G. Tonfoni. World Scientific Publishing Company: Singapore, pp. 1-40.

Posters, Abstracts, and Technical Presentations

- Saini-Eidukat, B., Schwert, D.P., Slator, B.M., Borchert, O., Cosmano, R., Hokanson, G., Rittel, C., and Tomac, S. (2002) Virtual Geologic Mapping in the Geology Explorer. Geological Society of America Annual Meeting Abstracts with Programs, v. 34, no. 6, p. 300.

- Saini-Eidukat, B., Schwert, D.P., Slator, B.M., Borchert, O., Cosmano, R., Hokanson, G., Rittel, C., and Tomac, S. (2002) A Multi-User Internet Based Geologic Mapping Exercise, in: Beyond Boundaries 2002: Integrating Technology into Teaching and Learning [CD-ROM], University of North Dakota, Grand Forks, September 19-20, 2002.

- Clark, J.T., B.M. Slator, J.E. Landrum, III, A. Bergstrom. A digital archive network for anthropology. Indo-Pacific Prehistory Association. September 9-15, 2002. Taipei, Tiawan.

- Clark, J.T. Scanning the future: digital technology for cultural heritage. International Conference for the 50th Anniversary of the First Lapita Excavation (July 1952). Pacific Archaeology: Assessments and Prospects. July 31 – August 7, 2002. Kone and Noumea, New Caledonia.

- Slator, Brian and Alan R. White (2002). Virtual Worlds for Education. Presentation for the Human-Compter Interaction Research group at Carnegie Mellon University. Pittsburgh, PA. September 4.

- Clark, Jeffrey T. and Brian M. Slator. DANA: the digital archive network for anthropology. Poster presented at the NSF Digital Library All-Projects Meeting. Washington, DC. December 3.

- Johnston, Eunice, Shawn Fisher, Brian M. Slator, and William Martinson (2002) Writing a MOO - MOOing to Write: creating a virtual native American village and fur trading post and using it to teach creative writing. Panel presentation at the 5th Annual Great Plains Alliance for Computers and Writing, Fargo, ND, April 26-28.

- Slator, Brian M. (2002). Virtual Worlds for Education, panel presentation at the NSF Information Technology Research and Education, Teaching and Learning Workshop, March 4-6, 2002 hosted by Nora Sabellie of SRI in Palo Alto, CA.

Vasant Ubhaya

Ubhaya, Vasant, An Algorithm for Approximation by Quasi-convex Functions on R^m, Computers and Mathematics with Applications, An International Journal, accepted for publication, 2003.

III. INSTRUCTIONAL PROGRAM, ENROLLMENT AND FTE DATA

Student Credit Hours and FTEs Generated

	1998-1999		1999-2000		2000-2001		2001-2002		2002-2003	
	Credit hours	FTE	Credit hours	FTE	Credit hours	FTE	Credit hours	FTE	Credit hours	FTE
100-200	9191	11.46	9176	11.47	8915	11.14	9097	11.37	8159	10.20
300-400	2295	4.22	2343	4.31	3243	5.96	3504	6.44	3279	6.03
600-700	1127	3.91	1279	4.44	1570	5.45	1506	5.23	1502	5.22
TOTAL	12613	19.62	12798	20.22	13728	22.56	14307	23.04	12940	21.44

Capstone Project Initiative

I. 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. Twenty-four projects sponsored by eleven distinct corporate, industrial, or government clients were developed for student teams. Over one-hundred students were actively participating during the Spring Semester. The Carnegie Foundation and the American Association of Higher Education recommends such approaches.

II. The approach taken under the new 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. Students are invited to apply for membership on individual teams. Each team prepares and delivers reports and presentations that are submitted for grades. Panels and guest lecturers on relevant topics will be included.

(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.

(4)   Where feasible, collaboration with student teams from other parallel courses on specific client projects were developed. The parallel courses for Spring, 2003 are as follows:

    a.   CSci 316, "System Testing and Maintenance," instructor Pratap Kotala

    b.   CSci 468/668, "Data Base Systems Design," professor Akram Salah

    c.   CSci 475 "Operating Systems," professor Ahmed Kamel

    d.   CSci 499/696, "ST/Distributed Software:XML," professor Ken Magel

    e.   CSci 714, "Software Project Plan/Estimation," professor Ken Magel

III.   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).

SUMMER II SCHEDULE
2002

COURSE HOURS	CLASS TITLE	INSTRUCTOR	STUDENT ENROLL	CREDIT
122	Programming in Basic	J. Olfert	9	3
146	Business Use of Computers	A. Sheikh	13	3
147	Microcomputer Packages	Dana Johnson	21	3
160	Computer Science I	B. Erickson	12	4

161	Computer Science II	B. Erickson	11	4
227	Computing Fund. I	A. Sheikh	5	3
235	Theoretical Computer Sc. 1	J. Martin	13	3
315	System Analysis & Design	K. Altenburg	20	3
372	Comparative Languages	B. Slator	59	3
373	Assembly Program	A. Kamel	15	3
499	Introducation to .NET	K. Magel	10	3
696	Introduction to .NET	K. Magel	17	3
708	Foundations of Programming	B. Erickson	14	3
760	Dynamic Programming	V. Ubhaya	17	3
790	Sem/Software Agents	A. Kamel	3	1
797	Master Paper	Staff	7	R-3
798	Master Thesis	Staff	7	R-10
799	Doctoral Dissertation	Staff	8	R-15

FALL SEMESTER SCHEDULE
2002

COURSE HOURS	CLASS TITLE	INSTRUCTOR	STUDENT ENROLL	CREDIT
101	Intro to Computing	D. Johnson	Cancelled	2
114	Microcomputer Packages	S. Mettu	60	3
114	Microcomputer Packages	M. Smadi	60	3
114	Microcomputer Packages	V. Tatta	58	3
114	Microcomputer Packages	S. Anugonda	60	3
114	Microcomputer Packages	D. Johnson	56	3
114	Microcomputer Packages	D. Johnson	61	3
116	Business Use of Computers	M. Viswanthan	59	4
116	Business Use of Computers	W. Zhao	59	4
116	Business Use of Computers	R. Abraham	59	4
116	Business Use of Computers	A. Ayyarasamy	47	4
116	Business Use of Computers	J. Olfert	55	4
116	Business Use of Computers	J. Olfert	52	4
122	Program in BASIC	J. Olfert	40	3
122	Program in BASIC	D. Muchow	24	3
155	Immigration (JAVA)	B. Erickson	5	3
159	CS Problem Solving	K. Grigsby	41	3
160	Computer Science I	S. Raha	27	4
160	Computer Science I	B. Erickson	30	4
160	Computer Science I	J. Martin	35	4
160	Computer Science I	J. Martin	34	4
161	Computer Science II	S. Raha	23	4
161	Computer Science II	S. Raha	18	4

172	Intermediate Basic/Visual	D. Johnson	Cancelled	3
214	Self-Paced C	S. Raha	19	1
222	Discrete Mathematics	B. Erickson	36	3
222	Discrete Mathematics	V. Ubhaya	43	3
227	Computing Fund. I	P. Kotala	31	3
227	Computing Fund. I	P. Kotala	Cancelled	3
227	Computing Fund. I	P. Kotala	37	3
235	Theoretical CS I	J. Martin	60	3
315	System Anal & Design	A. Salah	47	3
315	System Anal & Design	P. Kotala	44	3
345	Spec. Topic/Princ. Of Software Engr.	A. Salah	23	3
366	Files/Database System	A. Denton	41	3
366	Files/Database System	A. Denton	29	3
372	Comparative Languages	B. Slator	43	3
372	Comparative Languages	J. Tang	24	3
373	Assembly Programming	J. Tang	13	3
453	Linear Program Network	V. Ubhaya	5	3
458	Microcomputer Graphics	P. Juell	29	3
474	Operating Systems Conc.	A. Kamel	46	3
474	Operating Systems Conc.	K. VanHorn	25	3
488	Human-Computer Interaction	K. Magel	31	3
494	Ind. Study/Comp/Ethical Issues	K. Nygard	1	3
494	Ind. Study/Network Security	Dr. Fu	3	3
499	Foundations of Digital Enter.	D. Johnson	20	3
653	Linear Program Network	V. Ubhaya	2	3
658	Microcomputer Graphics	P. Juell	3	3
688	Human-Computer Interaction	K. Magel	9	3
693	Ind. Study/Network Security	Dr. Fu	23	3
696	Foundations of Digital Enter.	K. Nygard	19	3
708	Foundations of Programming	B. Erickson	18	3
713	Software Engineering I	K. Magel	30	3
765	Intro to Database Systems	Bill Perrizo	29	3
783	ST/Software Sys/Generic Prog	K. VanHorn	14	3
783	ST/Software Sys/Network Sec.	H. Fu	1	3
785	ST/Comp Arch/Impl/Infor Arch	W. Perrizo	7	3
790	Sem/ATM	Bill Perrizo	4	1
790	Sem/Database Systems	Bill Perrizo	9	1
790	Sem/Educational Media	B. Slator	1	1
790	Sem/Formal Met/Software Engr	A. Salah	12	1
790	Sem/ Extreme Programming	Ken Magel	6	1
790	Sem/Intelligent Agents	A. Kamel	5	1
797	Master Paper	Staff	33	R-3
798	Master Thesis	Staff	22	R-10
799	Doctoral Dissertation	Staff	7	R-15

SPRING SEMESTER SCHEDULE

COURSE HOURS	CLASS TITLE	INSTRUCTOR	STUDENT ENROLL	CREDIT
101	Intro to Computing	D. Johnson	Cancelled	2
114	Microcomputer Packages	E. Elzain	59	3
114	Microcomputer Packages	M. Smadi	55	3
114	Microcomputer Packages	S. Rahman	62	3
114	Microcomputer Packages	S. Desiraju	51	3
114	Microcomputer Packages	D. Johnson/Nandula	59	3
114	Microcomputer Packages	D. Johnson/Nandula	58	3
116	Business Use of Computers	S. Ramasamy	51	4
116	Business Use of Computers	M. Viswanthan	59	4
116	Business Use of Computers	R. Abraham	54	4
116	Business Use of Computers	A. Ayyarasamy	55	4
116	Business Use of Computers	J. Olfert/Bukkapatnam	53	4
116	Business Use of Computers	J. Olfert/Bukkapatnam	53	4
122	Program in BASIC	V. Mehto	39	3
125	COBOL Programming	J. Olfert	37	3
125	COBOL Programming	J. Olfert	41	3
159	Computer Sc. Problem Solving	K. Grigsby	36	3
160	Computer Science I	A. Denton	34	4
160	Computer Science I	A. Denton	36	4
161	Computer Science II	S. Raha	32	4
161	Computer Science II	S. Raha	15	4
161	Computer Science II	S. Raha	19	4
212	Self-Paced C++	S. Raha	22	1
228	Computer Fundamentals	P. Kotala	38	3
228	Computer Fundamentals	P. Kotala	28	3
236	Theoretical CS II	J. Martin	54	3
294	IS/Introduction to UNIX	J. Lattimer	8	3
316	System Testing & Maint	P. Kotala	45	3
316	System Testing & Maint	K. Jian	30	3
345	Topics in Personal Computers	Brian Slator	62	3
372	Comparative Languages	B. Erickson	20	3
372	Comparative Languages	B. Erickson	29	3
374	Computer Organization	J. Tang	41	3
374	Computer Organization	K. Jian	18	3
418	Simulation Models	K. Nygard	5	3
426	Intro/Artificial Intelligence	B. Slator	33	3
454	Operations Research	V. Ubhaya	2	3
459	Foundations of Computer Networks	H. Fu	33	3
467	Algorithm Analysis	J. Martin	53	3
468	Database Systems Design	A. Salah	27	3
475	Operating Systems Design	A. Kamel	20	3

COURSE HOURS	CLASS TITLE	INSTRUCTOR	STUDENT ENROLL	CREDIT
489	Soc. Implications of Computer	A. Kamel	45	3
489	Soc. Implications of Computer	A. Kamel	66	3
495	IS/Intro to UNIX	J. Latimer		3
499	ST/Distributed Software XML	K. Magel	16	3
499	ST/Foundations of Digital Enterprises	D. Johnson	17	3
618	Simulation Models	K. Nygard	4	3
654	Operations Research	V. Ubhaya	6	3
659	Local Area Networks	H. Fu	15	3
668	Database Systems Design	A. Salah	12	3
693	IS/Operating Systems Design	A. Kamel	1	3
696	ST/Distributed Software XML	K. Magel	23	3
714	Software Proj Plan/Estimation	K. Magel	17	3
722	Compiler Construction	K. VanHorn	5	3
724	Survey of AI	P. Juell	31	3
728	Computer Graphics	P. Juell	7	3
741	Algorithm Analysis	V. Ubhaya	16	3
773	Foundations of Digital Enterprise	K. Nygard	8	3
774	Topics of the Digital Enterprise	K. Nygard	11	3
778	Computer Networks	B. Perrizo	7	3
785	Data Mining	W. Perrizo	10	3
790	Sem/Artificial Intelligence	P. Juell	4	1
790	Sem/Visualization	P. Juell	3	1
790	Sem/ATM	W. Perrizo	5	1
790	Sem/Database Systems	W. Perrrizo	8	1
790	Sem/Formal Methods in Software Engr.	A. Salah	4	1
790	Sem/Intelligent Agents	A. Kamel	1	1
790	Sem/Generic Programming	K. VanHorn	1	1
797	Master Paper	Staff	27	R-3
798	Master Thesis	Staff	23	R-10
799	Doctoral Dissertation	Staff	11	R-15

SUMMER I SCHEDULE
2003

COURSE HOURS	CLASS TITLE	INSTRUCTOR	STUDENT ENROLL	CREDIT
114	Microcomputer Packages	D. Johnson	21	3
116	Business Use of Computers	J. Olfert	27	4
122	Programming in Basic	J. Olfert	13	2
160	Computer Science I	B. Erickson	10	4
161	Computer Science II	B. Erickson	12	4
227	Computing Fund. I	P. Kotala	Cancelled	3
228	Computing Fund. II	P. Kotala	Cancelled	3
235	Theoretical Computer Sci. I	J. Martin	16	3

372	Comparative Languages	B. Slator	32	3
373	Assembly Programming	A. Kamel	12	3
496	Intro to Scientific Computing	S. Raha	Cancelled	3
699	Intro to Scientific Computing	S. Raha	Cancelled	3
713	Software Development Process	A. Salah	9	3
717	Software Construction	K. Magel	Cancelled	3
760	Dynamic Programming	V. Ubhaya	7	3
790	Sem/Adv. Topic in Network Security	H. Fu	3	1
790	Sem/Formal Methods in Software Engr.	A. Salah	7	1
797	Master Paper	Staff	4	R-3
798	Master Thesis	Staff	5	R-10
799	Doctoral Dissertation	Staff	10	R-15

STUDENT RATING OF INSTRUCTION RESULTS 2002-2003

FALL, 2002 and SPRING 2003

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.	24.1	50.0	19.4	4.9	1.2	0.3	3.912	0.879	1983
2. The instructor as a teacher.	27.0	47.9	18.6	4.5	1.7	0.3	3.942	0.899	1983
3. The ability of the instructor to communicate effectively	20.9	41.0	27.0	7.6	2.9	0.7	3.785	0.973	1977
4. The quality of this course	17.4	50.6	24.6	5.8	1.1	0.4	3.783	0.887	1980
5. The fairness of procedures for grading this course.	43.0	43.4	10.5	1.7	1.0	0.3	4.183	0.836	1979
6. Your understanding of the course content.	23.8	51.2	18.6	5.1	0.9	0.4	3.937	0.813	1978
300 TO 400 LEVEL									
1. Your satisfaction with the instruction in this course.	19.4	49.9	22.0	5.8	3.0	0.0	3.912	0.879	1983
2. The instructor as a teacher.	24.8	50.8	15.8	5.6	3.0	0.0	3.974	0.899	1983
3. The ability of the instructor to communicate effectively	19.9	49.2	20.5	6.9	3.5	0.0	3.785	0.973	1977
4. The quality of this course	16.8	45.3	24.8	9.3	3.7	0.2	3.783	0.887	1980
5. The fairness of procedures for grading this course.	29.6	47.7	15.5	5.4	1.9	0.0	4.183	0.836	1979
6. Your understanding of the course content.	19.6	55.3	20.3	3.4	0.9	0.6	3.937	0.813	1978
600 TO 700 LEVEL									
1. Your satisfaction with the instruction in this course.	41.2	45.1	9.9	3.4	0.0	0.4	3.912	0.879	1983
2. The instructor as a teacher.	48.5	38.6	10.3	2.1	0.0	0.4	3.974	0.899	1983

3. The ability of the instructor to communicate effectively	47.2	38.6	10.7	2.6	0.0	0.9	3.785	0.973	1977
4. The quality of this course	34.8	50.6	12.4	0.9	0.4	0.9	3.783	0.887	1980
5. The fairness of procedures for grading this course.	41.6	42.9	9.9	3.0	0.4	2.1	4.183	0.836	1979
6. Your understanding of the course content.	28.8	53.6	15.5	0.9	0.4	0.9	3.937	0.813	1978

UNDERGRADUATE ADVISEES 2002-2003

D. Bruce Erickson

*Fregien, Carla   Sophomore
Pascal, Freeman   Sophomore
Zeltwanger, Matthew   Sophomore

Bitzegaio   Junior
Bladow, Garrett   Junior
Bollinger, Nathan   Junior
Cai, Sufeng   Junior
Campbell, Blaine   Junior
McGinnity, Steve   Junior
Volske, Jonathan   Junior

Brown, Rance   Senior
Campbell, Blaine   Senior
Creswell, Daniel   Senior
Erickson, Kellie   Senior
Fasteen, Neil   Senior
Lyon, Kari   Senior
Maus, Brock   Senior
McGinnity, Steve   Senior
Nelson, Troy   Senior
Stelter, Blair   Senior

Huirong Fu

Mutegi, Collins   Freshman
Pham, Chau   Freshman
Tran, Long   Freshman

Gayed, Alexander	Sophomore
Post, Travis	Sophomore
Pratt, Alexander	Sophomore
Tobosa, Glen	Sophomore
Jaszkowiak, Joseph	Junior
Knoll, Martin	Junior
Paulus, Kenneth	Junior
Suda, Anthony	Junior
Teske, Nicholaus	Junior
Cossette, Peter	Senior
Dill, Rachel	Senior
Folmer, Todd	Senior
Helm, Luke	Senior
Murugaiyan, Elangovan	Senior
Nelson, Douglas	Senior

Paul Juell

*Baba, Hamza	Freshman
*Kern, Derek	Freshman
*Scheibe, Lucas	Freshman
*Anderson, Joshua	Sophomore
*Brandt, Thomas	Sophomore
*Bikic, Mirela	Sophomore
Kitzman, Jon	Sophomore
Kuchar, Michael	Sophomore
*Shields, Jared	Sophomore
*Arbach, Bradley	Junior
*Fudge, Adam	Junior
*Griffin, Michael	Junior
*Hodgson, Daniel	Junior
*Meek, Jeffrey	Junior
*Schmaltz, Kevin	Junior
*Schmidt, Neil	Junior
*Anderson, Andrew	Senior
*Bachmeier, Jeff	Senior
*Buresh, Jason	Senior
*Calderwood, Matthew	Senior
*Gross, Brian	Senior
Kitzman, Jon	Senior
*Kramer, Nicholaus	Senior
*Leapaldt, Andrew	Senior
*McDonough, Robin	Senior
*Mairs, Rebecca	Senior

*Malnourie, Joshua	Senior
*Meiers, Brandon	Senior
*Monson, Kami	Senior
Morman, Jeffrey	Senior
*Satrom, Timothy	Senior
*Sunde, Brandon	Senior
Susag, Alex	Senior
Voecks, David	Senior

Ahmed Kamel

Odegaard, Casey	Freshman
Voegele, Chad	Freshman
Birkeland, Daniel	Sophomore
Croonenberghs, Justin	Sophomore
Entzel, Eric	Sophomore
Gonzalez, Alexander	Sophomore
Johnson, Cyle	Sophomore
Korf, Steve	Sophomore
Mindeman, Benjamin	Sophomore
Tierney, Andrew	Sophomore
Wright, Wesley	Sophomore
Gilbertson, Paul	Junior
Haugen, Erich	Junior
Mack, Jessica	Junior
Laturnus, Lisa	Senior
Levasseur, Jesse	Senior

Kenneth Magel

*Dorn, Randy	Freshman
*Rittgers, Bradley	Freshman
*Stenslie, Darren	Freshman
*Branca, Thomas	Sophomore
*Hardy, Jared	Sophomore
Lindahl, Joseph	Sophomore
*Morris, Joel	Sophomore
*Brisk, Luke	Junior
*Everson, Dustin	Junior
*Masset, Ryan	Junior
*Nelson, Alissa	Junior
*Peterson, Mitchell	Junior
*Richtsmeier, Todd	Junior
Schweyen, Celeste	Junior
*Shell, Derek	Junior

*Collins, Gail	Senior
Duncan, Joseph	Senior
Heggen, Jennifer	Senior
Nichols, Christopher	Senior
*Pawlowski, Anthony	Senior
*Powell, Mark	Senior
*Roppe, Gretchen	Senior

John Martin

Abdinasir, Mohamed	Freshman
Anderson, Kenneth	Freshman
Anderson, Noah	Freshman
Andrade, Jasson	Freshman
Arndt, Heather	Freshman
Augeson, Brady	Freshman
Blattner, David	Freshman
Boeckel, Tyler	Freshman
Boomgaarden, Jacob	Freshman
Brammer, Andrew	Freshman
Breimeier, Erik	Freshman
Breimeier, Paul	Freshman
Catlette, David	Freshman
Cochran, Stephen	Freshman
Cofell, Jayson	Freshman
Debilzan, Jordan	Freshman
Depyper, Laremy	Freshman
Devorak, William	Freshman
Driscoll, Troy	Freshman
Eichenberger, Aaron	Freshman
Flatt, Paul	Freshman
Forseth, Christopher	Freshman
Gronfur, Justin	Freshman
Gussiaas, Brian	Freshman
Haaland, Randy	Freshman
Halvorson, Brandon	Freshman
Carlton, Hanna	Freshman
Heid, Francis	Freshman
Johnson, Craig	Freshman
Kanenwisher, David	Freshman
Kingsley, Alex	Freshman
Koble, Matthew	Freshman
Konze, Michael	Freshman
Lorentz, Michael	Freshman
Lundell, Amber	Freshman
McGarthy, Kenneth	Freshman
McHugh, Jesse	Freshman
Mueller, Benjamin	Freshman
Papka, Brett	Freshman

Rosecrans, Aaron	Freshman
Schaff, Cordell	Freshman
Schaible, Niccole	Freshman
Schisler, Kenneth	Freshman
Schmitz, David	Freshman
Seifert, Bradley	Freshman
Shurts, Bradley	Freshman
Smedshammer, Steven	Freshman
Smith, Christopher	Freshman
Sorensen, Robert	Freshman
Vink, Ron	Freshman
Wahl, Devon	Freshman
Wenzel, Kyle	Freshman
Wiese, Anthony	Freshman
Wollan, Jared	Freshman
Wood, Matthew	Freshman
Bennett, Matthew	Sophomore
Christiansen, Zachariah	Sophomore
Conklin, Timothy	Sophomore
Horton, Kate	Sophomore
Kaale, Ikania	Sophomore
Larson, Tanon	Sophomore
Nordick, Michael	Sophomore
Peterson, James	Sophomore
Rodriquez, David	Sophomore
Sund, Josh	Sophomore
Thurn, Zachary	Sophomore
Welle, Michael	Sophomore
Albers, Jonathan	Junior
Allar, Jared	Junior
Azure, Nathan	Junior
Bjorneberg, Ben	Junior
Blaufuss, Jeffrey	Junior
Broberg, Amanda	Junior
Duncan, Lee	Junior
Fritz, Paul	Junior
Heilman, Ryan	Junior
Hughes, Eric	Junior
Karg, James	Junior
Kroshus, Nicholas	Junior
Elhassani, Abdelillah	Junior
Erickson, Peter	Junior
Feist, Matthew	Junior
Griggs, Ryan	Junior
Grindberg, Vylad	Junior
Hamre, Daniel	Junior
Masset, Dustin	Junior
Moen, Ryan	Junior
Nakamura, Kiyochika	Junior

Olson, Nathan	Junior
Parsons, Robert	Junior
Peterson, Eric	Junior
Salah, Ibrahim	Junior
Schmidt, Jeffrey	Junior
Small, Daniel	Junior
Vorachek, Scott	Junior
Wacker, Brian	Junior
Wang, Derek	Junior
Wurtz, Christopher	Junior
Anderson, Eric	Senior
Bachman, Wyatt	Senior
Besemann, Christopher	Senior
Bhalla, Pooja	Senior
Bladow, Katherine	Senior
Boll, David	Senior
Buchanan, Paul	Senior
Dischinger, Benjamin	Senior
Elhassani, Abdelillah	Senior
Elseth, Troy	Senior
Erhardt, Eric	Senior
Franz, Gary	Senior
Grueneich, Justin	Senior
Hetzler, Christopher	Senior
Hirning, Robert	Senior
Horning, Andrew	Senior
Imdieke, Christopher	Senior
Jelinek, Jason	Senior
Johnson, Bryan	Senior
Kadrmas, Jason	Senior
Kawamura, Satoshi	Senior
Kittelson, Dustin	Senior
Kranitz, Ryan	Senior
Kroh, Travis	Senior
Kulka, Isaac	Senior
Lake, Aaron	Senior
Lindvall, Nickolas	Senior
Maier, Nathan,	Senior
McDonough, Shaun	Senior
Mitchell, Chad	Senior
Nguyen, Nguyen	Senior
Ohlsen, Tyler	Senior
Pearson, Patrick	Senior
Pedersen, Derek	Senior
Pillatzki, Ryan	Senior
Plante, Douglas	Senior
Randleman, Eric	Senior
Rausch, Andrew	Senior
Salzsieder, Lynn	Senior
Schubert, Seth	Senior

Sellers, Eric	Senior
Sembu, Masatomo	Senior
Serani, Matthew	Senior
Serhienko, David	Senior
Shannon, Brooks	Senior
Taylor, Melissa	Senior
Thompson, Eric	Senior
Verret, Riley	Senior
Vetter, Denise	Senior
Whitlock, Joshua	Senior
Wiest, Wallace	Senior
Win, U.	Senior
Wu, Qipeng	Senior
Zechmann, Nicholas	Senior
Zuther, Jeremy	Senior

Kendall Nygard

Nies, Daniel	Freshman
Friesen, Eric	Sophomore
Puppe, Jay	Sophomore
Voecks, David	Sophomore
Erickson, Matthew	Junior
Vette, Bradley	Junior
Weyrauch, Douglas	Junior
Koehntop, Lucas	Senior
Phan, Xuyen	Senior
Puppe, Jay	Senior
Slag, Troy	Senior

William Perrizo

*Jacobson, Darin	Freshman
*Jensen, Jesse	Freshman
*Weber, Beau	Freshman
*Brandt, William	Sophomore
*Charlton, Linda	Sophomore
*Cherney, Jason	Sophomore
*Johnson, Joel	Sophomore
*Lee, Jeremy	Sophomore
*Nyborg, Noel	Sophomore
*Stotz, Melissa	Sophomore
*Biel, Daniel	Junior
*Christianson, Tara	Junior
*Friesen, Evan	Junior

*Gust, Christopher	Junior
*Nogosek, Kory	Junior
*Sharif, Mohamed	Junior
*Smith, Luke	Junior
*Timmerman, Mark	Junior
*Bossert, Tanner	Senior
*Flannery, Daniel	Senior
*Frueh, Jason	Senior
*Grenz, Ryan	Senior
*Hanson, David	Senior
*Heinrich, Alison	Senior
*Herberg, Joshua	Senior
*Klabo, Charles	Senior
*Lillehoff, Troy	Senior
*Lundberg, Brian	Senior
*Martens, Dana	Senior
*Olson, Anthony	Senior
Peterson, Kenneth	Senior
*Randklev, Tyler	Senior
*Schatzke, Kyla	Senior
*Smerud, Samuel	Senior
*Sweeney, Kristin	Senior
*Twete, Jeremy	Senior

Akram Salah

Fossaa, Marc	Freshman
Schreier, Thomas	Freshman
Bladow, Jeffrey	Sophomore
Christensen, Justin	Sophomore
Harmon, Ryan	Sophomore
Hartley, Corey	Sophomore
Langemo, Matthew	Sophomore
Lesnau, Ryan	Sophomore
Lorenz, David	Sophomore
Nelson, Phillip	Sophomore
Cade, W.B.	Junior
Cook, Matthew	Junior
Torgrimson, Tyler	Junior
Woinarowicz, Chad	Junior
Aus, Jason	Senior
Carroll, Christopher	Senior
Delarosa, Benjamin	Senior
Feist, Matthew	Senior
Hest, Joshua	Senior
Massee, Craig	Senior

Schwartz, Daniel   Senior
Voskuil, David   Senior

Brian Slator

Carlson, Saul   Freshman
Elmaraghy, Mohamed   Freshman

Ell, John   Sophomore
Johnson, Matthew   Sophomore
Palmer, Eric   Sophomore
Peterson, Charles   Sophomore
Pribula, Justin   Sophomore
Va, Savoeurn   Sophomore

Hetland, Nicholas   Junior

Frovarp, Richard   Senior
Johnson, Jacob   Senior
Matz, Randolph   Senior
Nguyen, Brian   Senior
Scherer, Matthew   Senior
Zerr, Michael   Senior

Vasant Ubhaya

Fischer, Christopher   Freshman

Heyne, Christopher   Sophomore
Messner, Dustin   Sophomore
Schafer, Derrick   Sophomore

Schmidt, Amanda   Junior
Simmer, Thomas   Junior
Stern, Kyle   Junior
Susag, Alex   Junior

Carpenter, Brian   Senior
Sell, Robert   Senior

Kevin Van Horn

Crockett, Linzey   Freshman
Goehring, Kelly   Freshman
Schmit, Nicholas   Freshman

Gronneberg, Evan   Sophomore
Holum, Brock   Sophomore
Lee, Dong   Sophomore
McDaniel, Jamie   Sophomore

Schisler, Lou	Sophomore
Welk, Kent	Sophomore
Wirth, Joshua	Sophomore
Hudson, Christopher	Junior
Kramer, Anthony	Junior
Kuvaas, Douglas	Junior
Rehman, Reza	Junior
Statz, Mitchell	Junior
Bjerke, Darren	Senior
Gardner, William	Senior
Gjerde, Ole	Senior
Halvorson, Jacob	Senior
Hoff, Nikki	Senior
Larson, Gregory	Senior
Lochner, Scott	Senior
Schlecht, Joseph	Senior
Schulte, Hayden	Senior

*Denotes MIS major

GRADUATE STUDENTS 2002-2003

<u>Masters Students:</u>

Akter, Khandker Shahin	Ferdinando, Rohini
Anugonda, Sreelatha	Foster, James
Ayyarsamy, Arunprakash	Grigsby, Kenneth
Beeram, Jagadish	Guo, Wenge
Benson, Douglas	Habib, MD
Besemann, Christopher	Haider, Chowdhury Omar
Borse, Priti	Haque, Mohammad Shahidul
Bukkapatnam, Sharath	Helaly, Tanjina
Chandel, Rahul	Hennebry, Michael
Chen, Lie	Hetzler, Christopher
Choi, Meegeum	Hokanson, Guy Eric
Cosmano, Robert	Hoque, Mohammad Mazharul
Cue, Yue	Huck, Jason
Denton, Anne	Huff, Nathan
Desaraju, Surya	Huq, Shamima
Dixon, John	Jiang, Yuehong
Duanmu, Shan	Kakumanu, Shalini
Dutta, Tridib	Kancherla, Sridhar
Elzain, Eltayeb	Khalique, Abu Saleh
Erhardt, Eric	Khan, Ezaz
Farheen, Swara	Kidd, Matthew

Krile, Terry
Kuck, David
Kunala, Santosh
Lee, Michael
Li, Mei
Li, Yuhuan
Loomba, Tavishi
Lu, Baojing
Majeed, Atif
Malakhov, Vasiliy
Manohar, Radha
Marla,Soma
Mehto, Vikram
Mistry, Dilip Kumar
Moses, Joseph
Muchow, Dale
Mugu, Vamshi
Murugaiyan, Elangovan
Nanam-Kumar, Sunil
Nandula, Aparna
Nanna, Tania
Nelson, Daniel
Njos, Robby
Opgrande, John
Padmanabhan, Ganesh
Pasupuleti, Satyanarayana
Patil, Archana
Phan, Thiep
Pikalek, Jonathan
Pool, Maxfield
Rahal, Imad
Rahman, Md Najeebur
Ray, Sisir

Regan, Patrick
Ren, Suqin
Sarker, MD Nuruzzaman
Sarker, MD Rashidul
Satter, Mehdi
Schlecht, Ryun
Seth, Deepak
Seth, Dheeraj
Smadi, Mohammad
Song, Lihong
Sreekantaradhya, Manohar
Sun, Guangyuan
Sun, Wei
Sun, Yongliang
Syamala, Ranapratap
Syed, Naveed
Tarequzzaman, NFN
Tatta, Vasanth
Vender, Bradley
Virupakshi, Vamsi
Viswanathan, Manohar
Viswanathan, Aruna
Wang, Yanchun
Wolf, Nicole
Wu, Shanhong
Wu, Weihua
Yang, Peining
Yu, Dongsheng
Yu, Meng
Yuan, Su
Zaman, Mahbub
Zhang, Gendong

PhD Students:

Abidin, Taufik
Abraham, Rina
Ahmed, Md
Anwar, Mohd
Borchert. Otto
Canton, Maria
Dargar, Anup
Desaraju, Surya
Desiraju, Srinivasa

Ding, Qiang
Farooq, Mohammad
Goli, Venkata
Govardhanagiri, Jogendra
Hamer, George
Hill, Curtis
Jockheck, William
Kotala, Pratap
Krebsbach, Stephen

Lua, Chin	Satter, Mehdi
Mettu, Srinivasa	Serazi, MD Masum
Najadat, Hassan	Shanmugasundaram, Vijayakumar
Naznin, Mahmuda	Tang, Jingpeng
Pan, Fei	Wang, Baoying
Perera, Amal	Yang, Ying
Rahal, Imad	Zhang, Bei
Ramaswamy, Sanjay	Zhang, Fang
Ren, Dongmei	Zhang, Ming
Reza, Hassan	Zhang, Yi
Saha, Debashis	Zhao, Wei
Sanchez, Julio	Zhong, Xiang

Computer Science Department Enrollment Data

	Enrollment (for term xx1)					Total	Total	Degree		
AY	1st FR	2nd SO	3rd JR	4th SR	5th SR+	UG	Grad	BS	MS	PhD
2002-2003	96	69	51	91		397	90	44	20	3
2001-2002	127	92	63	106		388	104	48	19	3
2000-2001	142	95	73	96		406	116	37	30	2
1999-2000	133	91	92	63		379	86	26	13	0
1998-1999	100	50	52	78		280	76	31	10	3
1997-1998	94	71	48	74		287	70	23	19	1

Graduate Degrees Awarded, 2002-03

Summer Semester, 2002	Degree
Ding, Qiang	MS
Ding, Qin	PhD
Khan, Md Abdul Kaleq	MS

Perera, Amal	MS
Tatta, Vasanth	MS
Zhong, Xiang	MS
Fall Semester, 2002	**Degree**
Chen, Lie	MS
Ferdinando, Rohini	MS
Goli, Venkata	PhD
Haque, Mohammad Sharidul	MS
Hoque, Mohammad	MS
Majeed, Atif	MS
Pasupuleti, Satyanarayana	MS
Ramaswamy, Sanjay	MS
Reza, Hassan	PhD
Yu, Dongsheng	MS
Yuan, Su	MS
Spring Semester, 2003	**Degree**
Anwar, Mohd	MS
Kidd, Matthew Charles Jr.	MS
Rahman, Md Najeebur	MS
Regan, Patrick	MS
Tang, Jingpeng	MS
Wolf, Nicole	MS