Computer Science Department
Annual Report
2006-2007

Summary
For the period July 1, 2006, through June 30, 2007, the resident faculty of the Computer Science Department included 21 full time faculty members (8 Professors, 5 Associate Professors, 8 Assistant Professors), 1 Temporary Assistant Professor, and 1 part-time Instructor. Permanent professional persons associated with the department included 3 office staff members and 3 technical support personnel.

As of Fall 2006, there were 93 graduate students enrolled in degree programs (52 in the doctoral program, 40 in the MS and 1 in the MAMS), and 200 declared undergraduate majors. Additionally, there were a total of 1262 seats offered in service courses, taken primarily by non-majors. During the past fiscal year, 13 students were awarded Ph.D. degrees and 14 graduated with the M.S. degree. Also, 42 Bachelor's degrees were awarded.

As a group, the faculty authored, co-authored, or edited 138 research articles and other publications and gave 32 presentations at professional meetings. Many of the faculty members have served on editorial boards of distinguished journals. Our faculty were PI, Co-PI, or contributors to 10 externally funded grants. The amount of the external funding totaled $4,114,839. Also, the faculty received 2 internal grants for the total amount of $16,000.

Prof. Amit Sheth left the University during the past year to assume a LexisNexis Professorship at Wright State University.

Major Accomplishments

External Research Funding
2006-2007 has been another good year for the faculty of the Computer Science Department. Two new grants were awarded to CS faculty. In total, ten of our faculty members have held externally funded research grants as PIs or Co-PIs. For additional details, please see Appendix B, beginning on page 18.

Dr. Suchi Bhandarkar has continued his work on a grant from the US Dept. of Agriculture. This is the last year of the grant.

Dr. Liming Cai has continued research on an NIH-sponsored project entitled Searching Genomes for Non-coding RNAs by Their Structure. This is a joint project with Prof. Russell Malmberg (as a Co-PI), UGA, Department of Plant Sciences.

Dr. Prashant Doshi has received a one year, $50,000 grant from Microsoft Research for his project on “Semantic Reconciliation with Disparate Sensor Meta-Data for Automatic Publication”.


Kang Li and Lakshmish Ramaswamy have received a new, three year grant from NSF for a project entitled *Adaptive Attacks and Defenses in Denial of Information*. The research will be performed in collaboration with Georgia Tech.

Dr. David Lowenthal has continued work on an NSF grant on *Detecting and Alleviating Sources of Scalability Problems*.

John A. Miller and Eileen T. Kraemer (Co-PIs), together with Dr. Jessica Kissinger (PI), a Professor in the Genetics Department at UGA, have continued their work on the NIH funded project entitled *Integrated Databases for Apicomplexan Pathogens*.

Dr. Amit Sheth, has continued working on the project funded by ARDA on *Ontology, Metadata and Semantic Association Support for Semantic Agent Based Document Protection*.

Drs. Amit Sheth, Budak Arpinar, John Miller, and Krys Kochut have continued research on a grant from NSF for their project *SemDis: Discovering Complex Relationships in Semantic Web*.

Drs. Amit Sheth, Krys Kochut, and John Miller have continued their work on the NIH-sponsored project entitled *Bioinformatics of Glycan Expression*. This is a part of a large five year project ($6,700,000) originating from the Complex Carbohydrates Research Center (Dr. Michael Pierce, PI).

**Scholarly Publishing**

The Computer Science faculty members have been very productive in publishing their research results. We have authored, co-authored, or edited 138 articles and other publications in 2006-2007. They were published or accepted for publication in high quality journals and conference proceedings. Our faculty gave 32 presentations at conferences, 6 of which were presented abroad. For the list of publications, please see Appendix C, beginning on page 20.

**Conference Organization**

As in the previous years, Dr. Hamid Arabnia has organized the 2007 *International MultiConference on Computer Science and Computer Engineering*. The Conference was held in June 2007, Las Vegas, Nevada. Dr. Arabnia has served as the General Chair of the MultiConference.

The LSDIS lab, one the research labs in our Department, organized the 5th *International Semantic Web Conference*. This large (550 participants) conference was held in Athens, GA, in November, 2006, at the Georgia Center for Continuing Education. In addition, Prof. Budak Arpinar served as the Local Organization Chair, while Prof. Amit Sheth as the Industry Track Chair.

Dr. Thiab Taha organized the *Fifth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory*. The conference was held in
Athens, Ga., April 16-19, 2007. Dr. Taha received funding for the organization of the conference from NSF.

**Strategic Planning**

**Computer Science Education**

Increasing the appeal of our undergraduate program, and Computer Science in general, has become one of our most important long range goals. This is especially true in view of the recent decline in undergraduate enrollments at UGA and in the nation. We have made important improvements to our undergraduate program in Computer Science. We have introduced *Areas of Emphasis*, which allow our students to focus on one of the available 6 areas, including Computer Systems, Software Design, Computational Science and Visualization, Internet and Information Technology, Theoretical Computer Science, and Artificial Intelligence. A selected Area of Emphasis may be completed by a specific selection of some of the required and elective courses. Typically, it does not require any additional coursework beyond the regular requirements for the B.S. degree in Computer Science.

In addition, our faculty members have introduced 10 new courses to our curriculum. The additions included 2 undergraduate, 5 split-level, and 3 advanced graduate courses. Furthermore, we have revised a number of our current courses. Our courses cover a wide range of topics for both undergraduate and graduate students.

As of Fall 2006, there were 93 students enrolled in graduate degree programs: 52 in the doctoral program, 40 in the MS program, and 1 in the MAMS program. Our Ph.D. program has continued to improve and grow. In the past year, 13 students were awarded Ph.D. degrees, the highest number so far. We are hoping that we will continue increasing the number of doctoral graduates. This situation should improve once the number of graduating Ph.D. students grows, increasing the number of assistantships available for recruiting. As stated in our plan, we intend to increase the number of our Ph.D. students.

**Faculty Recruitment**

Immediately after the departure of Prof. Amit Sheth, the Department made a request for permission to recruit his replacement. Our request has not been granted in the past year. We plan to continue our efforts to recruit Prof. Sheth’s replacement.

**Space**

In Spring, 2006, we have been notified that our offices and labs in Barrow Hall would be moving to Boyd Graduate Studies, some time during Summer, 2006. This will be a significant improvement for us, since our faculty and their labs will be located in 2 building (Boyd and Hardman Hall), instead of 3. This should improve the cohesiveness among the faculty body.

However, the move will not result in any increase of our space, and our overall space will continue to be insufficient. Most importantly, many of our faculty members have insufficient lab space, and a large portion of our graduate students have no office space whatsoever. There is no room which could serve as the Computer Science commons room.

We have reconfigured our main Computer Science Laboratory in 307 Boyd Grad Studies. Many of our students rely on their own laptop computers and do not require access to
departmental computing workstations. As a result, we have decreased the number of workstations in the lab. After a transition of one of our PC labs to the recovered space in 307, we have been able to create an additional lecture room in 208 Boyd Grad Studies. The new lecture room has been equipped with an overhead projector, laptop, and the associated network and video devices.

A. Short-Term Goals for FY 2008

Program Review
Our most recent Program Review and Assessment was conducted during the 2003-2004 academic year. The next review has been scheduled for AY 2010-2011.

Faculty Recruitment
We are planning to recruit a replacement faculty for Prof. Amit Sheth who left UGA in December, 2006. Also, we plan to initiate recruiting for a joint position with a unit in the Biological Sciences Division, or with the Faculty of Engineering, depending on funding availability.

Space
Despite the already described move of our offices from Barrow to Boyd, the department continues to suffer from an insufficient amount of space, especially in view of the recently hired faculty with research interests in experimental Computer Science. We have presented a document detailing our space needs to Dean of Arts and Sciences in 2006, but no additional space has been allocated to the Department.

B. Effectiveness Assessment
The Undergraduate Assessment Report for the academic year 2006-2007 has been created and submitted to the College. The report stated that we are doing a good job of meeting our stated learning objectives. Also, while we would like to attribute our improved performance measurements entirely to better teaching, the improvements may also be partly due to better students. The overall level of student preparation has improved partly in step with the overall rise in the quality of entering UGA students, and partly because the recent decline in the number of Computer Science majors has left us with the most highly motivated students.

C. Student Retention and Graduation Rates
As of Fall 2006, there were 195 declared undergraduate CS majors, a decrease of 36 students in comparison to Fall 2005. Our observed decline in the undergraduate student population has continued to be consistent with the decrease in the numbers of undergraduate CS majors across the country. However, the rate of decline has slowed significantly in the past year.

In the past year, 42 students graduated with B.S. in Computer Science, an increase in comparison to AY 2005. Most of our students found employment and some have continued their education at the graduate level at UGA, or other institutions.

As of Fall 2006, there were 93 students enrolled in graduate degree programs: 52 in the doctoral program, 44 in the MS program and 1 in the MAMS program. In the past year, 13 students were awarded Ph.D. degrees. As in the previous years, the availability of funding for graduate students continues to be a very important factor in the overall health of the
graduate program. In Fall 2006, 63 graduate students received financial support, as follows: Graduate Assistants, 40%; Graduate Teaching Assistants (in charge of a course), 6%; Research Assistants supported by external funding, 46%; University Wide Assistantships, 8%. In comparison to Fall 2005, a higher percentage of our students were supported by external funding.

Computer Science Ph.D. production was again at an all time high, as reported in the 2006-2007 Taulbee Survey. In all, 1,775 Ph.D.s were awarded between during this time.

In addition to graduate students and majors, the department taught several courses of a service nature, including CSCI 1100 (Introduction to Personal Computing), CSCI 1210 (Introduction to Computational Science), CSCI 1301 (Introduction to Computing and Programming), and CSCI 7010 (Computer Programming). A total of 1272 seats were offered in these courses.

D. Overall Status

Employment prospects for our graduates have been good at all levels. Nearly all of our students found employment almost immediately after graduation. We have graduated 13 Ph.D. students, the highest number so far, and several more are at the late stages in their doctoral programs. We have continued to provide quality education to a large number of students, both majors and non-majors.

In terms of research, our record, both in terms of external funding and scholarly publishing, has continued to improve. However, Prof. Amit Sheth left UGA. Replacing him will be an important goal, especially in view of his very good record in publishing and funding.

We have experienced a much smaller decrease in the number of undergraduate Computer Science majors, a decline nonetheless. To combat this trend, we have made improvements to our undergraduate program, both in terms of changes to the degree requirements, and in terms of the available courses.

We believe that the professional environment for Computer Science at UGA has continued to be very good.

APPENDICES

Attached are detailed listings of professional activities, grants, publications, and presentations of the faculty during the past year.
A. PROFESSIONAL HONORS AND RECOGNITIONS

H. R. Arabnia


Member, Board of Advisors, The International Journal of Information Technology and Systems (Editor-in-Chief, Prof. David Rine, George Mason University), 2002 – present.


Associate Editor, International Journal of Parallel & Distributed Systems & Networks (IJPDNS), Published by ACTA Press (Since 1999).

Member of Executive Board of Editors, American Journal of Applied Sciences, ISSN#: 1546-9239, USA (since 2003).

Member of Scientific Advisory Board, IOS Press, Medical and Care Compunetics, ISSN# 0926-9630 (since 2004).

Member of Editorial Board, International Journal of Information Technology: Applications and Management (IJITAM) (since 2005).

Member of Editorial Board, International Journal Engineering, Management and Science (IJEEMS) (since 2005).

Member of Editorial Board, Engineering Letters, ISSN: 1816-0948 and 1816-093X (since 2005).
Program Committee Member, International Conference on Parallel and Distributed Computing and Systems, PDCS, (1996 – 2006).

Member of Advisory Board of Virtual Medical Worlds - an on-line magazine by Euromed (European Commission in Telemedicine), http://www.hoise.com/project/VMW, 1997 – present).

Member of Program Committee, 12th International Conference on Parallel and Distributed Systems (ICPADS) / Systems Architecture, Minneapolis, USA, July 2006.


Listed in Marquis Who's Who in Science and Engineering (1999 – present)

Evaluator (15 departments), National Research Council (NRC) Survey of Program Quality, national ranking of CS and CE departments ranking, 2007.

Member of Steering Committee, IEEE 7th Symposium on BioInformatics & BioEngineering (BIBE 2007), October 14-17, Boston, Massachusetts, USA, 2007.

General Chair, WORLDCOMP’07 (World Congress in Computer Science, Computer Engineering, and Applied Computing; Academic Sponsors: MIT Media Lab., TACC of University of Texas at Austin, University of Harvard's Computational Biology and Functional Genomics Lab, Purdue University's Statistical & Computational Intelligence Lab, Georgia Institute of Technology's BioMedical Informatics & Bio-Imaging Lab., and others; Corporate Sponsors: Google, Intel, Salford Systems. June 25-28,Las Vegas, USA, 2007.


Member of Steering Committee, 2nd Int'l Conf. on Multimedia & Ubiquitous Engineering (MUE 2008), IEEE Computer Society, April 24-26, Seoul, Korea, 2008.

Member of Program Committee, 3rd IEEE Int'l Workshop on Performance Modelling and Analysis of Communication in Wired & Wireless Networks (PMAC-2WN’07) in conjunction with 13th Int'l Conf. on Parallel & Distributed Systems (ICPADS 2007), December 5-7, Hsinchu, Taiwan, 2007.

Member of Program Committee, ICCS 2007, Int'l Conf. on Computational Science, May 27-30, The 2nd Workshop on Internet Computing in Science & Engineering (ICSE'07), Beijing, P. R. China, 2007.

Panel Chair, the 2008 International CSI Computer Conference, March, Kish Island, Iran, 2008.

I. Budak Arpinar

Member, IEEE Computer Society, 2002 – present.
Member, ACM Sigmod, 1999 – present.
Reviewer, IEEE Internet Computing.
Reviewer, IEICE Transactions on Information and Systems.
Reviewer, Journal of Intelligent Systems.
Reviewer, Data and Knowledge Engineering Journal.
Reviewer, Encyclopedia of Database Technologies and Applications.
Reviewer, ETRI Journal.
Program Committee Member: International Semantic Web Conference (ISWC’07), Busan, Korea.
Program Committee Member: 207 IEEE/WIC/ACM International Conference on Web Intelligence, Silicon Valley, CA, 2007.
Program Committee Member: Web Information Systems Engineering Conference (WISE’2006), Wuhan, China, October 2006.
Program Committee Member: AAAI Fall Symposium on Semantic Web for Collaborative Knowledge Acquisition, Washington, DC, October 2006.

S. M. Bhandarkar

Associate Editor, International Journal of Applied Intelligence, November 1999 - present.
Member, Technical Committee on Pattern Analysis and Machine Intelligence, IEEE Computer Society, 1992-present.
Member, Association for Computing Machinery (ACM), 1990-present.
Member, International Society of Photo-optical and Instrumentation Engineers (SPIE), 1987-present.
Member, American Association for Artificial Intelligence (AAAI), 1985-present.
Member, Institute for Electrical and Electronic Engineering (IEEE), 1982-present.
Program Committee Member, IEEE International Conference Image Processing (ICIP), Atlanta, GA, October 2006.
Session Chair, Session on Biomedical Imaging, IEEE International Conference Image Processing (ICIP), Atlanta, GA, October 2006.
Program Committee Member, IEEE International Conference on Advanced Video and Signal-based Surveillance, Sydney, Australia, November 2006.
Program Committee Member, IEEE Workshop on Motion and Video Computing (WMVC), Austin, TX, February, 2007.
Program Committee Member, IEEE Workshop on Applications of Computer Vision (WACV), Austin, TX, February, 2007.

L. Cai

Reviewer, Algorithmica Journal.
Reviewer, Pure and Applied Logic Journal.
Reviewer, Intel. J. for Bioinformatics Research and Applications.
E. R. Canfield

Reviewer, Math Reviews.
Referee, Journal Combinatorial Theory, Series A and B.
Referee, American Mathematical Monthly.
Referee, National Science Foundation.
Member of the Association for Computing Machinery.
Editor, Electronic Journal of Combinatorics.

P. Doshi

Program Committee Member, First International Workshop on WebServices Composition and Adaptation, 2007.
Program Committee Member, AAAI Spring Symposium on Game Theory and Decision Theory, 2007.
Program Committee Member, Autonomous Agents and Multi-agent Systems Conference (AAMAS), 2007.
Program Committee Member, Artificial Intelligence and Pattern Recognition (AIPR), 2007.

S. H. Funk

Member of IEEE
Member of ACM

M. Hybinette

Member, Association for Computing Machinery.
Member, Institute of Electrical and Electronics Engineers.
Reviewer, Winter Simulation Conference (WSC), 1996 – present.
Reviewer, Workshop on Parallel and Distributed Simulation (PADS), 1997 – present.

**K. J. Kochut**

Member, Association for Computing Machinery.
Member, SIGMOD.
Member, SIGCOMM.
Reviewer, IEEE Transactions on Knowledge and Data Engineering.
Reviewer, Information Systems.
Referee, The Computer Journal
Referee, Journal of the American Society for Information Science and Technology
Referee, International Journal of Computer Simulation
Referee, Data and Knowledge Engineering
Referee, IEEE Transactions on Knowledge and Data Engineering
Referee, Cole Publishing
Member of the Program Committee, International Multiconference on Computer Science and Information Technology, Wisla, Poland, November 6-10, 2006.

**E. T. Kraemer**

Information Visualization in Biomedical Informatics (IVBI), 2007.
Member, Anita Borg Technical Leadership Award Committee, Anita Borg Institute for Women and Technology (2006, 2007).
Member, Tutorials Committee, Supercomputing 2006.
First Workshop on Empirical Assessment of Software Engineering Languages and Technologies (WEASELTech’07), Organizer with Jonathan Maletic.
Referee, IEEE Transactions on Systems, Man, and Cybernetics
Referee, CHI2006 (ACM)
Referee, ACM Transactions on Software Engineering and Methodology
Referee, National Science Foundation, Advanced Computational Research Program.
Referee, IEEE Transactions on Software Engineering.
Referee, IEEE Transactions on Parallel and Distributed Systems.
Referee, Transactions on Software Engineering and Methodology.
Referee, Bioinformatics.
Referee, Software-Practice and Experience Cybernetics and Systems.

Kang Li

Conference Co-Chair for CEAS, 2007.
Session Chair for ACM/SPIE MMCN, 2007.
TPC Member for IEEE ICCCN NeTRA, 2007.
TPC Member for ACM/SPIE MMCN, 2007.
Member of ACM
Member of SIGCOMM

D. K. Lowenthal

Member, ACM, 1992-present.
Member SIGPLAN, 1992-present.
Member, SIGOPS, 1992-present.
Referee, International Parallel and Distributed Processing Symposium (IPDPS).
Referee, Computer Languages.
Referee, Architectural Support for Programming Languages and Operating Systems (ASPLOS).
Workshops and Tutorial Chair: PPOPP 2008.

J. A. Miller

Editorial Board Member of International Journal of Simulation and Process Modelling (IJSPM), 2004 – present.
Editorial Board Member of the Journal of Simulation (JOS), 2005 – present.
Associate Editor, ACM Transactions on Modeling and Computer Simulation (TOMACS), 1999 – present.
Associate Editor, IEEE Transactions on Systems, Man and Cybernetics (TSMC), 1999 – present.
Referee, ACM Transactions on Modeling and Simulation.

W. D. Potter

Program Committee Member, 4th Indian International Conference on Artificial Intelligence (IICAI’2007), June 2007.
Program Committee Member, International Multi-Conference on Systems, Cybernetics and Informatics (WMSCI’2006), July 2006.
External dissertation reviewer: Swinburne University of Technology, Victoria, Australia, 2006.

Referee, IEEE Computer.


Referee, International Journal for Applied Intelligence.

Referee, Journal of Intelligent and Fuzzy Systems: JIFS.

Referee, Pattern Recognition Letters.

L. Ramaswamy

Reviewer for IEEE Transactions on Knowledge and Data Engineering (TKDE), IEEE Transactions on Parallel and Distributed Systems (TPDS), and VLDB Journal.

Reviewer for IEEE Internet Computing Journal.

K. M. Rasheed

Member, Institute of Electrical and Electronics Engineers (IEEE).

Member, IEEE Computer Society.

Member, IEEE Neural Network Society.

Member, International Society for Genetic and Evolutionary Computation (ISGEC).

Member, American Association for Artificial Intelligence (AAAI).


Referee, IEEE Intelligent Systems.

Referee, IEEE Transactions on Evolutionary Computation


Referee, Journal of Artificial Intelligence Research (JAIR).

Referee, Artificial Intelligence in Engineering Design and Manufacturing (AIEDAM).

Referee, International Association for Mathematics and Computers in Simulation (IMACS).
Referee, Machine Learning Journal (MLJ).
Referee, Applied Intelligence.
Referee, Pattern Recognition Letters.

**R. W. Robinson**


**A. P. Sheth**


Senior Member (2003), IEEE and IEEE Computer Society, including Technical Committee on Database Engineering, 1981 – present.


Member of the Editorial Board, Journal on Distributed and Parallel Databases, 1992 - present.

Associate Editor, SIGMOD Record, 1988 – present.

Member, Association for Computing Machinery, SIGMOD and other SIGs.

Member, IEEE Computer Society, including Technical Committee on Database Engineering.

Member of the Board and Founding Member, International Foundation on Cooperative Information Systems, 1996 – present.


Referee, VLDB Journal.

Referee, National Science Foundation.

Referee, Research Council of Norway.
Referee, Information Systems.
Referee, Intelligent Information Systems.
Referee, Distributed and Parallel Databases.
Referee, Intelligent and Cooperative Information Systems.
Referee, Computer.
Referee, IEEE Transaction on Knowledge and Data Engineering.
Referee, Edited 3 Database Research Center Reports for *ACM SIGMOD Record* as Associate.
Referee, Edited 3 Media Reviews for IEEE Multimedia.

**J. W. Smith**

Member of IEEE

**T. R. Taha**

Member, Association of Computing Machinery (ACM).
Member, Society for Industrial and Applied Mathematics (SIAM).
Member, SIAM SEAS.
Member, International Association for Mathematics and Computers in Simulation (IMACS).
Member, SIAM Activity Group on Supercomputing.
Member, SIAM Activity Group on Computational Science.
Member, IMACS technical committee on Dynamical Systems and Nonlinear Science, 1992 - present.
Member, Institute of Electrical and Electronics Engineers (IEEE), Inc.
Referee, Computers and Mathematics with applications.
Referee, Mathematics and Computers in Simulation.
Referee, Numerical Mathematics for Partial Differential Equations.
Referee, Simulation: The Journal of the Society for Computer Simulation, Hong Kong.
Referee, Journal of Science and Technology/Sultan Qaboos University of Oman.
Referee, Derasat/Journal of Sciences, University of Jordan, Jordan.
Referee, Journal of Physics B: Molecular and Optical Physics.
Referee, Numerical Algorithms, C. Brezinski, Editor-in-Chief, France.
Member, Editorial Board of The International Arab Journal of Information Technology (IAJIT).
B. GRANTS AWARDED OR CURRENT

EXTERNALLY FUNDED GRANTS


Canfield, E.R. (PI), J.W. Smith and H.R. Arabnia, University of Georgia Yamacraw Program (2005-2006), Georgia Governor’s Office, $604,756, continued support for permanent/continued staff and faculty positions for the Department of Computer Science.


Pu, C. (PI), K. Li (PI) and L. Ramaswamy (Co-PI), “CT-T: Adaptive Attacks and Defenses in denial of Information”, National Science Foundation Cybertrust program, 2007-2010, $800,000 (UGA component - $231,854).


INTERNALLY FUNDED GRANTS


C. FACULTY PUBLICATIONS AND PRESENTATIONS

PUBLISHED ARTICLES AND CHAPTERS IN BOOKS: (senior author listed first)


98. Philippa Rhodes, Eileen Kraemer, and Bina Reed, “The Importance of Interactive Questioning Techniques in the Comprehension of Software Visualizations”, in Proceedings of ACM Symposium on Software Visualization (SoftVis ’06), pp. 183 – 184, September 4-5, 2006, Brighton, UK.


PRESENTATIONS AT MEETINGS


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