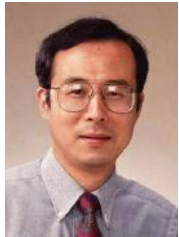


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DEPARTMENT OF COMPUTER SCIENCE  
GEORGIA STATE UNIVERSITY

SPRING 2006

## MESSAGE FROM THE CHAIR



Dr. Yi Pan

The Department of Computer Science reached two major milestones in the spring of 2006. For the first time, one of our faculty members was awarded the prestigious CAREER award from the National Science Foundation. Also, our department hosted its first international conference, the 2006 IEEE International Conference on Granular Computing. Another highlight of the spring was the success of our students in the Windows Embedded Student Challenge, which earned our team a trip to Microsoft headquarters. We are very proud of the accomplishments of our faculty and students!

## LI RECEIVES NSF CAREER AWARD

Dr. Yingshu Li, a first-year assistant professor of computer science, received a prestigious award from the National Science Foundation's Faculty Early Career Development (CAREER) Program. The CAREER award will provide Dr. Li with about \$400,000 in support over the next five years.

The award, formerly known as the NSF Presidential Young Investigator Award, is the most competitive and prestigious award from NSF to young faculty members in science and engineering fields. The award places emphasis on high-quality research and novel education initiatives.

"CAREER awards support exceptionally promising college and university junior faculty who are committed to the integration of research and education," says NSF Director Rita Colwell. "We recognize these faculty members, new in their careers, as most likely to become the academic leaders of the 21st century."



Dr. Yingshu Li

Dr. Li's award was especially significant in several respects. It is the first such award in the history of Georgia State's Department of Computer Science and only the fourth to a Georgia State faculty member since 2000. Moreover, Dr. Li received the award the first time she applied for it.

The proposal submitted by Dr. Li was titled "Algorithms for Optimization Problems in Wireless Networks." She proposed to study how to maximize the lifetime of wireless networks, using both theory (such as algorithms for solving the coverage and dominating set problems) and simulation tools.

Dr. Li received her B.S. degree in computer science from Beijing Institute of Technology in 2001. She earned M.S. and Ph.D. degrees in computer science from the University of Minnesota, Twin Cities, in 2003 and 2005. Her research interests include wireless networks, optimization algorithm design, and computational biology. Her papers have appeared in many top journals and conferences.

## IEEE INTERNATIONAL CONFERENCE HELD AT GEORGIA STATE

The 2006 IEEE International Conference on Granular Computing (IEEE-GrC 2006) was held at Georgia State on May 10–12. Granular computing is a general computation theory for effectively using granules such as classes, clusters, subsets, groups, and intervals to build an efficient computational model for complex applications with huge amounts of data, information, and knowledge. It has begun to play important roles in bioinformatics, e-business, security, machine learning, data mining, high-performance computing, and wireless mobile computing in terms of efficiency, effectiveness, robustness, and uncertainty. The conference brought together researchers from universities, laboratories, and industry to present new results in the theory and applications of granular computing.



Dr. Lily Liang, Dr. Lotfi Zadeh, Dr. Yan-Qing Zhang, and Bo Jin at the Georgia Aquarium during IEEE-GrC 2006

A key ingredient of IEEE-GrC 2006 was a distinguished lecture series, jointly organized with Georgia State, that featured two "Nobel" laureates—Stephen Smale (winner of the Fields Medal, often called the "Nobel Prize" for mathematics) and Lotfi Zadeh (winner of the IEEE Medal of Honor, the "Nobel Prize" for electrical engineering)—and two pioneer experts, T. Y. Lin (granular computing) and Vladimir Vapnik (support vector machines), who was recently elected to the National Academy of Engineering.

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Dr. Ming Li, Dr. Stephen Smale, Dr. Einoshin Suzuki, Dr. Vladimir Vapnik, Dr. Xindong Wu, and Dr. Ronald Yager in a panel at IEEE-GrC 2006

## GRANULAR CONFERENCE

(continued from Page 1)

IEEE-GrC 2006 received 321 paper submissions from 22 countries; 49 six-page papers and 102 four-page papers were accepted for publication in the proceedings. In addition, there were 5 six-page papers and 12 four-page papers in four special sessions. The best paper award was given to Tony Bellotti, Zhiyuan Luo, and Alex Gammerman for their paper “Reliable Classification of Childhood Acute Leukaemia from Gene Expression Data using Confidence Machines.”

The conference was sponsored by the IEEE Computational Intelligence Society. Dr. Yi Pan was one of the conference’s general co-chairs, Dr. Yan-Qing Zhang was a co-chair of the program committee, Dr. K. N. King was a publicity co-chair, and Dr. Anu Bourgeois and Dr. Raj Sunderraman were local arrangements co-chairs.

## TEAM PLACES IN TOP 30 IN EMBEDDED COMPETITION

A team of Georgia State computer science majors was among 30 finalists for the Windows Embedded Student Challenge 2006. The Georgia State team was one of only five teams from the United States to place in the top 30. The third annual Windows Challenge competition challenges undergraduate teams of four—with a faculty mentor—to design a computer-based system that solves a real-world problem.

Approximately 300 teams entered the competition. Judges selected 200 teams to advance to the next round. These teams were sent a Challenge Kit containing hardware and software valued at several hundred dollars. After using the kit to complete their projects, teams submitted final reports. Based on these reports, 30 teams were awarded expense-paid trips to visit the Microsoft campus in Redmond, Washington, for the Challenge finals on June 22–24.

Winning teams were eligible for cash prizes, including the first prize of \$8,000.

The members of the Georgia State team were Drew Phebus, David Tomaschik, Mike McGreevey, and Kyle Cooper. The team’s advisor was Dr. Michael Weeks. Their project, titled “RAIN: ReActive Irrigation Nexus,” involved designing an innovative system that detects if an area of soil needs watering and, if so, turns on a sprinkler. The RAIN system includes a gypsum sensor to determine moisture levels, a circuit to convert the signals of the sensor into usable data, and a graphical user interface that allows the user to easily maintain a lawn.



David Tomaschik, Mike McGreevey, Dr. Michael Weeks, Drew Phebus, and Kyle Cooper at Microsoft headquarters

## FACULTY PROFILE: XIAOLIN HU

One of the newest faculty members in the Department of Computer Science is Dr. Xiaolin Hu, who joined Georgia State University in the fall of 2004 as an assistant professor.



Dr. Hu earned a B.S. in Automatic Control from the Beijing Institute of Technology in 1996 and an M.S. from the Institute of Automation at the Chinese Academy of Sciences in 1999. He then came to the

Dr. Xiaolin Hu

U.S. to study with Bernard Zeigler at the University of Arizona, receiving the Ph. D. in Electrical and Computer Engineering in 2004.

Dr. Zeigler, a prominent figure in the field of computer simulation, is the director of the Arizona Center for Integrative Modeling and Simulation. At Arizona, he led a group that developed the Discrete Event System Specification (DEVS) formalism. Dr. Hu’s dissertation work extended Dr. Zeigler’s DEVS research by developing a simulation-based software development methodology to manage the complexity of distributed real-time software. In particular, he built a virtual test environment that allows control models to be tested using simulation before being deployed. He was able to use the environment to support the creation of several distributed autonomous robotic systems, including a system in which mobile robots search for each other and form a team, and a system in which robots convoy and maintain a line formation.

Dr. Hu’s research interests include modeling and simulation, autonomous robotic systems, bio-inspired models, model-based design, and software engineering. One of his current projects is joint work with Dr. Don Edwards of Biology. Their project involves building a DEVS-based environment for simulating crayfish behaviors identified by Dr. Edwards.

Another project, an extension of Dr. Hu’s thesis, is an environment that allows real robots to interact with virtual robots. He is currently supervising three students who are building a robot for use in this project. He is also in the early stages of a long-term project to build autonomous software. Both projects involve the application of ideas from living organisms.

Since coming to Georgia State, Dr. Hu has received five grants, the largest of which is a three-year, \$200,000 grant from the National Science Foundation for collaborative research between Texas A&M University and Georgia State. The goal of the research is to develop a dynamic data-driven real-time decision support system for wildland fire spread prediction and containment that integrates simulation and stochastic optimization. His other grants include a GSU Faculty Mentoring Grant for a project in which he will apply the neurobiological study of crayfish to designing adaptive robot control models.

Dr. Hu has published seven journal articles and 12 conference papers, with several other papers submitted for publication. He is also the co-author of two book chapters.

Dr. Hu has twice served as Program Chair for the DEVS Integrative M&S Symposium, which is held annually in conjunction with the Spring Simulation Multiconference of the Society for Modeling and Simulation Interna-

## RECENT PH.D. GRADUATES

**Yuchun Tang.** *Dissertation:* Granular Support Vector Machines Based on Granular Computing, Soft Computing and Statistical Learning. *Advisor:* Dr. Yan-Qing Zhang. *Current position:* Research Scientist, CipherTrust, Inc. (May 2006)

tional, and he is scheduled to be program chair once again next year. He has been a member of the program committee for the 2006 IEEE International Conference on Granular Computing, the 44th ACM Southeast Conference (ACMSE 2006), and the Agent-Directed Simulation Symposium (ADS '06). He is currently on the program committee for the International Modeling and Simulation Multiconference 2007 and ADS '07.

So far, Dr. Hu's teaching has focused on software engineering. In the past two years, he has taught both CSc 4350/6350 (Software Engineering) and CSc 8350 (Advanced Software Engineering) twice. He has also taught graduate seminars on object-oriented simulation and discrete event modeling and on robots and multi-robot systems.

## SUNDERRAMAN AND ZHU RECEIVE NIH GRANT

Dr. Raj Sunderraman and Dr. Ying Zhu, in collaboration with primary investigator Dr. Paul Katz from the Department of Biology, have been awarded a National Institutes of Health R21 Grant for \$291,000. The project is titled "NeuronBank: A Database for Identified Neurons and Synaptic Connections" and runs from March 2006 to March 2008.

The goal of the project is to create a web-based resource, called NeuronBank, to catalog and organize identified neuronal types and their synaptic connections. The project will facilitate research on model invertebrate nervous systems, which are comprised of individually identifiable neurons. It will also serve as a testbed for understanding the issues involved in creating a complete wiring diagram of more complex mammalian brains, which contain identifiable neuronal types. When completed, NeuronBank will allow information about neuronal types and their connections to be published and accessed online.

More information about the NeuronBank project can be found at [www.neuronbank.org](http://www.neuronbank.org).

## FACULTY NEWS

**Dr. Raheem Beyah** participated in a panel on wireless and mobile security for distributed systems at the 24th IEEE Symposium on Reliable Distributed Systems (SRDS 2005). This conference is the pre-eminent forum for researchers and practitioners interested in distributed systems and design and development, particularly with properties such as reliability, availability, safety, security, and real time. SRDS 2005 was held October 26–28 in Orlando, Florida.

**Dr. Raheem Beyah** has been chosen to participate in the L.E.A.D. Atlanta class of 2007, a Leadership Atlanta initiative for young professionals. L.E.A.D. Atlanta provides partici-

pants the opportunity to enhance their leadership skills, tackle challenges facing the community, and develop contacts early in their careers. L.E.A.D. ("Leadership, Education, Action, and Direction") Atlanta incorporates issues and challenges facing Atlanta but also includes skill-building that will aid participants in their career and community involvement.

**Dr. Raheem Beyah** was recently awarded a Georgia Tech FACES Career Initiation Grant. The Facilitating Academic Careers in Engineering and Science (FACES) program is a collaborative effort between the College of Engineering and College of Sciences at the Georgia Institute of Technology, Emory University, Morehouse College, and Spelman College designed to significantly increase the number of African-Americans receiving doctoral degrees in engineering and science and ultimately increase the number of these individuals entering the professoriate. With funding from the National Science Foundation, the FACES program awards two Career Initiation Grants valued at \$30,000 each to promising doctoral students who accept a tenure-track faculty position in an engineering or science field at a U.S. college or university. The grant can be used to purchase research equipment as well as support graduate and/or undergraduate research assistants.

**Dr. Xiaolin Hu** was the program chair of the DEVS Integrative M&S Symposium of the 2006 Spring Simulation Multiconference (SpringSim '06) sponsored by the Society for Modeling and Simulation International. The symposium, which was held in Huntsville, Alabama on April 2–6, provided a forum for scientists and professionals to present recent developments in the theory and applications of DEVS-based modeling and simulation.

An article by **Dr. Xiaolin Hu** was featured in the December issue of the IEEE Systems, Man, and Cybernetics Society eNewsletter.

The article is based on a paper recently published in *IEEE Transactions on Systems, Man, and Cybernetics*.

**Dr. Yi Pan** delivered two keynote speeches and one invited speech at three conferences during a trip in China last September. He gave a keynote talk titled "Protein Structure Prediction and Understanding Using Machine Learning Methods" at the 5th International Conference on Computer and Information Technology (CIT2005), which was held on September 21–23 in Shanghai, and a keynote talk on "Public Computing and Its Scheduling Strategies" at the 2005 Symposium on Information, Electronics, and Control Technologies (IECT 2005), held on September 29 in Chengdu. He also gave an invited talk at a regional symposium in Chengdu during the trip.

A paper co-authored by **Dr. Yi Pan** (along with Y. Xiao and J. Li) is among the most downloaded papers at the IEEE Xplore web site. Statistics for the last three months of 2004 show that the paper, titled "Design and Analysis of Location Management for 3G Cellular Networks," was the fourth most downloaded paper published in *IEEE Transactions on Parallel and Distributed Systems* during that year or any prior year. The paper appeared in the April 2004 issue of the journal.

**Dr. Alex Zelikovsky** recently won Best Poster awards at two conferences. One award was for a poster titled "Yield-Driven Multi-Project Reticle Design and Wafer Dicing" (with A. B. Kahng, I. I. Mandoiu, and X. Xu), presented at the 25th SPIE BACUS International Symposium on Photomask Technology in October. The other award was for the poster "2SNP: New Scalable Phasing Method" (with Ph.D. student Dumitru Brinza), presented at the Fifth Georgia Tech International Conference on Bioinformatics in November.

## RECENT DEPARTMENTAL COLLOQUIA

**February 24.** "Simulation-based Testing of Emerging Defense Information Systems," *Dr. Bernard P. Zeigler*, Arizona Center for Integrative Modeling and Simulation and Joint Interoperability Test Command, Fort Huachuca, Arizona

**March 5.** "A New Computing Paradigm: Transparent Computing," *Dr. Yaoxue Zhang*, Tsinghua University

**March 17.** "A Steganographic Approach to Motif Finding that Combines Word Counting and Statistical Modeling," *Dr. Weixiong Zhang*, Washington University in St. Louis

**March 31.** "What Is a Desirable Energy Function for Proteins and How Can It Be Obtained?" *Dr. Yaoqi Zhou*, University at Buffalo

**April 21.** "Data Mining Approaches to Genomic Data Analysis," *Dr. Aidong Zhang*, University at Buffalo

**June 16.** "Web Intelligence Meets Brain Information," *Dr. Ning Zhong*, Maebashi Institute of Technology

## DEPARTMENT WELCOMES VISITING PROFESSOR

The department is honored to host Bernard P. Zeigler as a visiting professor during his sabbatical. Dr. Zeigler is a professor at the University of Arizona and a co-director of the Arizona Center for Integrative Modeling and Simulation. He is internationally known for his research in discrete event modeling and simulation and the Discrete Event System Specification (DEVS) formalism. During his stay at Georgia State, Dr. Zeigler will collaborate with Dr. Xiaolin Hu as well as researchers from the Oak Ridge National Laboratory and Georgia Tech.

## PH.D. STUDENT PARTICIPATES IN DATA MINING CUP CONTEST

Bo Jin, a Ph.D. candidate advised by Dr. Yan-Qing Zhang, participated in the Data Mining Cup Contest 2006. More than 570 students from 177 universities and 42 countries took part in the contest, which ended on May 31. Of 189 submissions, Mr. Jin's solution ranked 42nd (second in the U.S.) with 4496 points and an accuracy of 78.1%. The top-ranked solution received 5020 points with an accuracy of 81.375%. This year's DMC Contest task consisted of developing a data mining

model that predicts for each new auction whether the actual sales revenue is higher than the average sales revenue of the product category. The DMC Contest is organized annually by German company prudsys AG and the Technische Universität Chemnitz.

## ACM STUDENT CHAPTER ELECTS NEW OFFICERS

The GSU student chapter of the ACM recently elected officers for the 2006–2007 academic year. The new officers are:

*Chair:* Akshaye Dhawan  
*Vice Chair:* Navin Vishmiwanath  
*Secretary:* Evelyn Brannock  
*Treasurer:* Ed Bullwinkel  
*Program Chair:* Chao Xie  
*Publicity Chair:* Dharam Damani  
*Membership Chair:* Larry Fitzgerald  
*Webmaster:* Diana Mohan

The chapter thanks Gulsah Altun, who is stepping down after having been an ACM officer for five years and the chair for the last three years.

## STUDENTS RECEIVE AWARDS AT HONORS DAY

The following computer science students were presented with departmental awards at the annual Arts and Sciences Honors Day ceremony:

### Outstanding Senior Award

Michael Balaun

### Outstanding Graduate Research Award

Dimitru Brinza

### Outstanding Teaching by a Graduate Student Award

Akshaye Dhawan

Jingwu He

The ceremony was held on April 12 at Georgia State's Rialto Center for the Performing Arts.

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### Have something to say?

Mail suggestions and alumni news to  
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