

pointers

DEPARTMENT OF COMPUTER SCIENCE
GEORGIA STATE UNIVERSITY

SPRING 2010

MESSAGE FROM THE CHAIR



Dr. Yi Pan

The highlight of last fall was the success of our faculty in receiving new grants from the National Science Foundation. Dr. Xiaolin Hu, Dr. Alex Zelikovsky, and Dr. Sushil Prasad were awarded grants with a total value of \$574,000. In these

challenging economic times, it is a tribute to our faculty that we were successful in winning these significant new awards.

CS FACULTY WIN NSF GRANTS

Dr. Xiaolin Hu is the lead principal investigator for a \$1 million National Science Foundation Collaborative Research grant. Dr. James Nutaro from Oak Ridge National Laboratory is the co-principal investigator. Georgia State will receive \$300,000 from the four-year grant, which is for a project titled "Integrated Weather and Wildfire Simulation and Optimization for Wildfire Management." The remaining money will go to the University of Oklahoma, where Dr. Ming Xue is the principal



Dr. Xiaolin Hu

investigator and Dr. Yang Hong is the co-principal investigator, and to Texas A&M University, where Dr. Lewis Ntamo is the principal investigator.

The grant will allow Dr. Hu and his collaborators to develop new models and computation methods for effective wildfire response management. The goal of the project is to reduce losses caused by wildfires by providing data to make better firefighting resource-management decisions. The researchers will collaborate with the Texas Forest Service to field-test systems developed with funding from the grant.

The new grant builds on work done under an NSF grant that Dr. Hu received in 2007. It is also related to his recent NSF CAREER Award. Funding for both the new grant and the CAREER Award comes from the American Recovery and Reinvestment Act of 2009, an economic stimulus package enacted by Congress last February. Dr. Hu's wildfire-modeling research has attracted wide interest, with stories appearing in the *Atlanta Journal-Constitution* and the *Atlanta Business Chronicle*, among other media outlets.

Dr. Alex Zelikovsky received a \$224,000 NSF grant for a project titled "Reconstruction of Haplotype Spectra from High-Throughput Sequencing Data." The grant will run for three years, starting September 1, 2009.



Dr. Alex Zelikovsky

High-throughput sequencing (HTS) is a technique for parallelizing the DNA sequencing process, allowing thousands or millions of sequences to be produced simultaneously. Research to be performed under the grant involves developing efficient computational methods for reconstructing the full spectrum of haplotype sequences from HTS data. In collaboration with molecular biologists from the University of Connecticut Health Center and the Centers for Disease Control, Dr. Zelikovsky will develop methods to enable three novel applications of HTS. Work will include

developing a comprehensive analytical toolkit for these applications, along with high-quality open-source software implementations.

Dr. Sushil Prasad was awarded a \$50,000 NSF grant for a project titled "A Planning Workshop on Curriculum Standards for Parallel and Distributed Computing." The grant, which runs for one year, will support a workshop that explores the state of parallel and distributed computing education, assesses education needs in this area, and recommends how best to address these needs. One outcome of the grant is expected to be an annual curriculum workshop at the IEEE International Parallel and Distributed Processing Symposium, the flagship conference of the IEEE Computer Society Technical Committee on Parallel Processing (TCPP). Dr. Prasad also plans to establish a TCPP committee that would set curriculum standards.



Dr. Sushil Prasad

CONTENTS

- 1 Message from the Chair
- 1 CS Faculty Win NSF Grants
- 2 Prasad Reelected Chair of TCPP
- 2 IPDPS Coming to Atlanta
- 2 Pan Is Co-Editor of Wireless Networking Book
- 2 ISBRA Moves to Connecticut in 2010
- 3 Beyah Is Co-Editor of Network Security Book
- 3 Department Hosts Visiting Scholars
- 3 ACM Chapter Welcomes New Officers
- 3 Internal Grants Awarded to Computer Science Faculty
- 3 Faculty News
- 4 Babaie Given Joint Appointment
- 4 Zhao Wins Award at NAFIPS
- 4 Ph.D. Students Are Local Co-Chairs for 2010 Grace Hopper Celebration
- 4 Ai Receives Travel Grant

WE NEED YOUR HELP

These are exciting times in the Department of Computer Science. Our program is rapidly expanding. We are hiring nationally-recognized scholars who conduct state-of-the-art research, and we are attracting the best students from around the world. Your generous donation will help us continue to improve in the years ahead. For information about giving to the department, please visit cas.gsu.edu/giving.aspx. Your gifts are tax-deductible to the fullest extent allowed by law. To ensure that your donation reaches us, please designate that it go to "Computer Science."

PRASAD REELECTED CHAIR OF TCPP

Dr. Sushil Prasad has been reelected chair of the IEEE Computer Society Technical Committee on Parallel Processing. His first term of office was from July 2007 to June 2009. His second term will end in June 2011.

With nearly 85,000 members, the IEEE Computer Society is the world's leading organization of computing professionals. Founded in 1946, it is the largest of the 38 societies of the IEEE. The Computer Society sponsors over 40 Technical Committees, which serve as the focal point for the society's activities within a technical discipline and directly influence standards development, conferences, publications, and educational activities.

The Technical Committee on Parallel Processing (TCPP) acts as an international forum to promote parallel processing research and education, and participates in setting up technical standards in this area. Topics of interest are related to the design, analysis and implementation of parallel systems and solutions, including design and analysis of parallel architectures and algorithms as well as application development on parallel machines.

Among other activities, TCPP sponsors professional conferences and workshops. The flagship conference is the International

Parallel and Distributed Processing Symposium (IPDPS), which is held annually in the spring. TCPP also sponsors the International Conference on High Performance Computing (HiPC).

IPDPS COMING TO ATLANTA

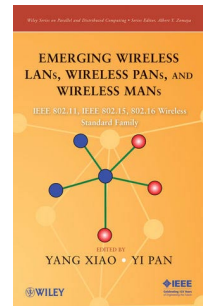
The 24th IEEE International Parallel and Distributed Processing Symposium (IPDPS 2010) will be held at the Sheraton Atlanta Hotel on April 19–23. IPDPS is the flagship conference of the IEEE Computer Society Technical Committee on Parallel Processing (TCPP). It is held annually at locations around the world, with an average attendance of about 600.

IPDPS 2009, which was held in Rome last May, featured 100 paper presentations (chosen from 440 submissions), three keynote talks, and a panel. In addition, the 2009 conference included 21 workshops and a Ph.D. forum. Attendees came from over 40 countries. IPDPS 2010 has received over 500 paper submissions. The conference will have 19 workshops and a Ph.D. forum.

The general chair of IPDPS 2010 is Dr. David Bader of Georgia Tech. Georgia State faculty involved in the conference include Dr. Sushil Prasad, the chair of TCPP, and Dr. Anu Bourgeois, who will serve as local arrangements co-chair.

PAN IS CO-EDITOR OF WIRELESS NETWORKING BOOK

Dr. Yi Pan is a co-editor of the recently published book *Emerging Wireless LANs, Wireless PANs, and Wireless MANs: IEEE 802.11, IEEE 802.15, 802.16 Wireless Standard Family* (ISBN 978-0-471-72069-0), along with Dr. Yang Xiao of the University of Alabama.



The book, which is part of the Wiley Series on Parallel and Distributed Computing, describes current and emerging IEEE 802 wireless standards and draft standards, including those for wireless LANs, wireless PANs, and wireless MANs. It also provides information on MAC (medium access control) and related physical layer protocols with an emphasis on channel access and power management.

Emerging Wireless LANs consists of 23 chapters, divided into five parts: (1) IEEE 802.11 wireless LANs, (2) IEEE 802.15.1 Bluetooth and IEEE 802.15.2, (3) IEEE 802.15.3 wireless PANs, (4) IEEE 802.15.4 and 802.15.5 wireless PANs, and (5) IEEE 802.16 wireless MANs. Dr. Pan is the co-author of two chapters.

Published by John Wiley & Sons, *Emerging Wireless LANs* is a 648-page hardcover book. Copies are available at Amazon.com for \$110.

ISBRA MOVES TO CONNECTICUT IN 2010

On May 23–26, the University of Connecticut will host the 6th International Symposium on Bioinformatics Research and Applications (ISBRA '10). Faculty members from Georgia State's Department of Computer Science have helped organize this conference since it began in 2005 as the International Workshop on Bioinformatics Research and Applications. ISBRA was held on the Georgia State campus in 2007 and 2008.

Authors are invited to submit papers that demonstrate original research in all areas of bioinformatics and computational biology, including the development of experimental or commercial systems. Surveys of important recent research results and directions are also welcome. The deadline for submitting extended abstracts (12 pages) was January 29. Authors of accepted abstracts will be notified by February 19, with final versions due on March 5. The deadline for submitting short abstracts (4 pages) is April 2. Notification will occur by April 16, with final versions due on April 23.

RECENT PH.D. GRADUATES

Yi Sun. *Dissertation:* High Performance Simulation of DEVS Based Large Scale Cellular Space Models. *Advisor:* Dr. Xiaolin Hu. (August 2009)

Xiaoyuan Suo. *Dissertation:* A Task-Centered Visualization Design Environment and a Method for Measuring the Complexity of Visualization Designs. *Advisor:* Dr. Ying Zhu. *Current position:* Assistant professor, Webster University. (August 2009)

Navin Viswanath. *Dissertation:* Inconsistency and Incompleteness in Relational Databases and Logic Programs. *Advisor:* Dr. Raj Sunderraman. *Current position:* Software engineer, LogicBlox, Inc. (August 2009)

Chinh Vu. *Dissertation:* Distributed Energy-Efficient Solutions for Area Coverage Problems in Wireless Sensor Networks. *Advisor:* Dr. Yingshu Li. *Current position:* Viet Nam Education Publishing House. (August 2009)

Qiong Cheng. *Dissertation:* Metabolic Network Alignments and Their Applications. *Advisor:* Dr. Alex Zelikovsky. *Current position:* Post-doctoral associate, Center for Computational Science, University of Miami. (December 2009)

Akshaye Dhawan. *Dissertation:* Distributed Algorithms for Maximizing the Lifetime of Wireless Sensor Networks. *Advisor:* Dr. Sushil Prasad. *Current position:* Assistant professor, Department of Mathematics and Computer Science, Ursinus College. (December 2009)

Stefan Gremalschi. *Dissertation:* Optimization Techniques for Protein-Protein Co-Regulation and Interaction Prediction. *Advisor:* Dr. Alex Zelikovsky. *Current position:* Senior software engineer and application development technical lead, LogicBlox, Inc. (December 2009)

Xue Wang. *Dissertation:* Predicting Protein Calcium Binding Sites. *Advisor:* Dr. Guantao Chen. *Current position:* Post-doctoral associate, Department of Chemistry, Georgia State University. (December 2009)

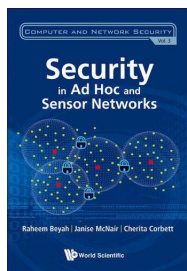
Yiwei Wu. *Dissertation:* Connected Dominating Set Construction and Application in Wireless Sensor Networks. *Advisor:* Dr. Yingshu Li. (December 2009)

Accepted extended abstracts will be published prior to the symposium in the Springer Verlag Lecture Notes in Bioinformatics series. Accepted short abstracts will be published online and on CD-ROM. The authors of selected extended abstracts will be invited to submit full versions to a special issue of *IEEE/ACM Transactions on Computational Biology and Bioinformatics*. All other authors will be invited to submit full versions to a peer-reviewed volume to be published later in *BMC Proceedings*.

The steering chairs of ISBRA '10 are Dr. Dan Gusfield (University of California, Davis), Dr. Yi Pan (Georgia State), and Dr. Marie-France Sagot (INRIA). The general chairs are Dr. Ion Mandoiu (UConn) and Dr. Alex Zelikovskiy (Georgia State). The program chairs are Dr. Mark Borodovsky (Georgia Tech), Dr. J. Peter Gogarten (UConn), Dr. Teresa Przytycka (NIH), and Dr. Sanguthevar Rajasekaran (UConn), with Dr. Yufeng Wu (UConn) and Dr. Craig Nelson (UConn) serving as workshop chairs. The publicity chair is Dr. Dumitru Brinza (Life Technologies). Dr. Anu Bourgeois (Georgia State) and Dr. Raj Sunderraman (Georgia State) are the finance chairs.

ISBRA '10 is sponsored by the UConn School of Engineering, the Booth Engineering Center for Advanced Technology, and Life Technologies.

BEYAH IS CO-EDITOR OF NETWORK SECURITY BOOK



Dr. Raheem Beyah is a co-editor of the new book *Security in Ad Hoc and Sensor Networks* (ISBN 978-981-4271-08-0), along with Dr. Janice McNair of the University of Florida and Dr. Cherita Corbett of Sandia National Labora-

tories. The book, which is volume 3 of the Computer and Network Security series, consists of 13 chapters written by experts in network security. The chapters are grouped into four sections: Authentication and Confidentiality, Privacy, Reliability, and Network Management and Configuration. One of the chapters in the Privacy section is co-authored by Dr. Xiaojun Cao. Topics covered in the book include attacks, malicious node detection, access control, authentication, intrusion detection, privacy and anonymity, key management, location verification, security architectures and protocols, secrecy and integrity, network resilience and survivability, and trust models. Published by World Scientific, *Security in Ad Hoc and Sensor Networks* is a 406-page hardcover book. It is available at Amazon.com for \$120.

DEPARTMENT HOSTS VISITING SCHOLARS

The department was honored to host two new visiting scholars during Fall Semester 2009.

- **Longjiang Guo.** Dr. Guo is an associate professor at Heilongjiang University in China. His research interests include wireless sensor networks, data stream processing, and data mining. During his visit, which will last at least a year, Dr. Wang will collaborate with Dr. Yingshu Li on research related to data management in heterogeneous wireless networks.
- **Jianxin Wang.** Dr. Wang is a professor and head of the Department of Computer Science at Central South University in China. His research interests include algorithms, bioinformatics, and wireless networking. During his six-month visit, he will collaborate with Dr. Yi Pan on bioinformatics and wireless networking research. Dr. Wang is supported by the China Scholarship Council, a nonprofit institution affiliated with China's Ministry of Education.

ACM CHAPTER WELCOMES NEW OFFICERS

The Georgia State University student chapter of the ACM recently elected officers for the 2009–2010 academic year. The new officers are:

Chair: Saurav Karmakar

Vice Chair: Marco Valero

Secretary: Nick Mancuso

Treasurer: Vinay Madhadi

Program Chair: Jason Marcell

Publicity Chair: Adrian Caciula

Membership Chair: Lakshmi Kollepara

Webmaster: Chad Frederick

INTERNAL GRANTS AWARDED TO COMPUTER SCIENCE FACULTY

Four Computer Science faculty members were among 38 Georgia State professors who recently won internal grants from the university. The awards were competitive, with 103 applications reviewed by an Internal Grant Peer Review Committee consisting of 25 senior faculty members. The winning CS facul-

ty members were recipients of Research Team Awards, which provide funding for interdisciplinary research teams to prepare proposals for external research funding.

One Research Team Award went to Dr. Yan-Qing Zhang, Dr. Robert Harrison, Dr. Xiaolin Hu, and Dr. Alex Zelikovskiy (Computer Science), Dr. Irene Weber and Dr. John Houghton (Biology), Dr. Markus Germann and Dr. Donald Hamelberg (Chemistry), and Dr. Guantao Chen (Mathematics and Statistics) for a proposal titled "Multidisciplinary Research in Bioinformatics and Complex Systems." The other award went to Dr. Yujun G. Zheng (Chemistry) and Dr. Yan-Qing Zhang (Computer Science) for "An Interdisciplinary Approach to Discovering New Substrates of PRMTs."

FACULTY NEWS

Dr. Raheem Beyah will serve as a co-chair for the Computer and Network Security Symposium, one of thirteen symposia to be conducted at the 6th International Wireless Communications and Mobile Computing Conference (IWCMC 2010). Under the theme of "Innovative Communications for a Better Future," IWCMC 2010 will target a wide spectrum of state-of-the-art as well as emerging topics pertaining to wireless networks, wireless communications, and mobile computing. The conference will be held in Caen, France on June 28–July 2.

Dr. Yingshu Li and several colleagues won the best paper award at the Fifth International Conference on Mobile Ad-hoc and Sensor Networks (MSN 2009). The award was for the paper "Processing Area Queries in Wireless Sensor Networks," co-authored by Ph.D. student Chunyu Ai, visiting scholar Dr. Longjiang Guo, and Dr. Zhipeng Cai of Mississippi State University. MSN 2009 was organized by Fujian Normal University and supported by Hong Kong Polytechnic University and City University of Hong Kong. The conference was held on December 14–16, 2009, at Wuyi Mountain, China.

Dr. Alex Zelikovskiy was promoted to the rank of Professor, effective Fall 2009.

Dr. Ying Zhu was promoted to the rank of Associate Professor with tenure, effective Fall 2009.

RECENT DEPARTMENTAL COLLOQUIA

October 23. "Automatic Modeling of Procedural Knowledge and Feedback Generation in a Tutoring System for Computer Science," *Dr. Davide Fossati*, Georgia Institute of Technology

November 20. "Large-Scale Spatial Temporal Data Driven Simulation for Wildfire Management – Towards an Interdisciplinary Research and Education Agenda," *Dr. Xiaolin Hu*, Georgia State University

BABAIE GIVEN JOINT APPOINTMENT

Dr. Hassan Babaie of the Department of Geosciences has been granted a joint appointment in the Department of Computer Science. Dr. Babaie performs research in geoinformatics with Dr. Raj Sunderraman. The two faculty members won an internal Research Team Award in 2008. Using funding from this grant, they created the SAFOD Brittle Microstructure and Mechanics Knowledge Base (SAFOD BM₂KB), a database of findings about microstructures and mechanics of brittle faulting, gathered from studies of SAFOD cores. SAFOD stands for San Andreas Fault Observatory at Depth, an NSF-funded project in which a deep hole was drilled in the San Andreas Fault Zone. Dr. Babaie and Dr. Sunderraman have applied for an NSF grant to further develop SAFOD BM₂KB.



Dr. Hassan
Babaie

ZHAO WINS AWARD AT NAFIPS

Ph.D. student Yanjun Zhao won the Best Student Paper Award at the 28th North American Fuzzy Information Processing Society Annu-

al Conference (NAFIPS 2009). The paper, titled "Biological Data Classification Using Rough Sets and Support Vector Machines," was co-authored by her Ph.D. advisor, Dr. Yan-Qing Zhang, and Dr. Naixue Xiong, a postdoctoral fellow at Georgia State. Ms. Zhao received a cash prize of \$500. Four papers were selected by the program committee prior to the conference as candidates for best student paper. These papers were presented in a special session and judged on both content and presentation.

The NAFIPS conference, held in Cincinnati on June 14–17, 2009, was sponsored by the North American Fuzzy Information Processing Society, the premier fuzzy society in North America.

PH.D. STUDENTS ARE LOCAL CO-CHAIRS FOR 2010 GRACE HOPPER CELEBRATION

Ph.D. students Mary Hudachek-Buswell and Stefanie Markham have been named local/volunteer co-chairs for this year's Grace Hopper Celebration of Women in Computing (GHC). In this role, they will coordinate local arrangements for the conference as well as organizing volunteers to assist with the event. GHC, which was inspired by the legacy of Admiral Grace Murray Hopper, focuses on

the research and career interests of women in computing. Started in 1994, the conference was originally held every three years but is now an annual event. The 2009 GHC, which drew 1570 attendees to Tucson last fall, was sold out. Organizers are planning for 2000 people to attend this year's GHC, to be held at the Hyatt Regency Atlanta on September 29–October 2. GHC is presented by the Anita Borg Institute for Women and Technology and the Association for Computing Machinery.

AI RECEIVES TRAVEL GRANT

Ph.D. student Chunyu Ai was awarded a \$600 travel grant to attend the Fourth International Conference on Wireless Algorithms, Systems, and Applications (WASA '09). At the conference, she presented the paper "In-network Historical Data Storage and Query Processing Based on Distributed Indexing Techniques in Wireless Sensor Networks," co-authored by Dr. Ruiying Du, Dr. Minghong Zhang, and Dr. Yingshu Li (her Ph.D. advisor). WASA '09 is a leading conference for presenting research in the area of algorithms, systems, and applications for current and next-generation wireless networks. The conference was held in Boston on August 16–18, 2009.

pointers

*published by the
Department of Computer Science
Georgia State University*

**P.O. BOX 3994
ATLANTA, GA 30302-3994**

Have something to say?

Mail suggestions and alumni news to
webmaster@cs.gsu.edu.