

# pointers

DEPARTMENT OF COMPUTER SCIENCE  
GEORGIA STATE UNIVERSITY

FALL 2005

## MESSAGE FROM THE CHAIR



Dr. Yi Pan

Welcome to our redesigned newsletter! The new look will make the newsletter easier to read and allow us to provide better coverage of what's happening in the department. 2005 was a significant year for the Department of Computer Science. Here are some of the highlights:

Here are some of the highlights:

- Dr. Scott Owen was elected president of SIGGRAPH, the world's leading computer graphics organization.
- Dr. Martin Fraser retired after serving as chair of the department for six years.
- The department produced five Ph.D. graduates, joining the first two graduates in December 2004.
- The department organized the SECABC Fall Workshop on Biocomputing.
- Two new faculty members joined the department.

We look forward to more progress in 2006.

## DEPARTMENT AWARDS FIRST PH.D. DEGREES

On December 18, 2004, the Department of Computer Science achieved a major milestone when it awarded its first Ph.D. degrees to Ajay Katangur and Bryson Payne.

Dr. Katangur's dissertation was titled "Routing Algorithms and Performance Evaluation for Optical Multistage Networks with Limited Crosstalk." His advisor was Dr. Yi Pan. Dr. Katangur is an assistant professor at Texas A&M University-Corpus Christi.

Dr. Payne's dissertation was titled "Accelerating Scientific Computation in Bioinformatics by Using Graphics Processing Units as Parallel Vector Processors," and his advisor was Dr. Scott Owen. Dr. Payne is an assistant professor at Georgia College and State University.

The department awarded another Ph.D. in August 2005 and four more in December 2005. For a list of the recipients, see page 2.



Dr. Bryson Payne and Dr. Ajay Katangur, the department's first Ph.D. recipients

## BEYAH AND LI JOIN DEPARTMENT

Two new assistant professors, Dr. Raheem Beyah and Dr. Yingshu Li, joined the department in August.



Dr. Raheem Beyah

Dr. Beyah received a B.S. in electrical engineering from North Carolina A&T State University in 1998. He earned M.S. and Ph.D. degrees in electrical and computer engineering from the Georgia Institute of Technology in 1999 and 2003, respectively. Dr. Beyah has been a member of the research faculty in Georgia Tech's Communications Systems Center since August 2001. Prior to joining Georgia Tech, he worked as a consultant in the Network Solutions group at Accenture (formerly Andersen Consulting). Dr. Beyah's research interests include network security, security visualization, and Internet traffic characterization. He is a member of IEEE, ACM, and NSBE.

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.

Dr. Li's research interests include wireless networks, optimization algorithm design, and computational biology. She has published around 20 papers in top journals and conferences, including *Journal of Combinatorial Optimization*, *Journal of Parallel and Distributed Computing*, *Theoretical Computer Science*, *Wireless Communications and Mobile Computing*, *International Journal of Bioinformatics Research and Applications*, *IEEE INFOCOM*, and *IEEE IPCCC*. She is also one of the editors of the books *Combinatorial Optimization in Communication Networks* and *Advances in Wireless Sensor Networks*. She is a member of the IEEE.



Dr. Yingshu Li

## FRASER RETIRES AFTER 33 YEARS

The department lost one of its most prominent faculty members with the retirement in June of its long-time chair, Martin D. Fraser. Dr. Fraser served 33 years at Georgia State University as a member of the Department of Computer Science, the Department of Mathematics and Computer Science, and the Department of Mathematics.

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## FRASER RETIRES

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Dr. Martin Fraser and Dr. Yi Pan

Dr. Fraser was born in San Diego but his family moved to St. Louis when he was young. He received three degrees—B.S., M.S. (Research), and Ph.D.—from Saint Louis University, majoring in mathematics for all three degrees but writing his dissertation in mathematical statistics. Dr. Fraser belonged to Air Force ROTC during his undergraduate years. His M.S. (Research) degree was earned while on an active duty assignment for graduate study in mathematics, after which he was reassigned for four more years and attained the rank of captain.

As an undergraduate, Dr. Fraser attended a seminar on FORTRAN, but he didn't begin writing programs until his military service in California. The first language he used was ALGOL 60, which he picked up during a part-time job at the Stanford Linear Acceler-

ator. He later learned JOVIAL (an extended version of ALGOL 58 that was used in the Air Force) and a CDC assembly language.

During his service in the Air Force, Dr. Fraser was assigned to the Air Force Satellite Test Center in Sunnyvale, California (in the heart of today's Silicon Valley). His work included writing functional tests of software revisions, reviewing and approving software system test designs, and analyzing test results. These duties sparked his later interest in software engineering.

While studying for the Ph.D., Dr. Fraser spent his summers at Western Electric in St. Louis as an information systems designer, working on statistical inventory and forecasting systems. After completing the Ph.D., he moved to Atlanta in 1972 to join Georgia State as an assistant professor in the Department of Mathematics. He was promoted to associate professor and tenured in 1977.

In 1983, Dr. Fraser took a leave of absence to work at American Greetings in Cleveland, Ohio. As the statistical analysis manager there, his work included providing statistical support to department projects and the corporation. Finding Cleveland's snowy weather not to his liking, he returned to Georgia State in 1985. He was promoted to full professor in 1990.

Despite a long-standing interest in computers, Dr. Fraser didn't become a full-time computer scientist until 1991. He had taught computer science courses off and on since the early 1980s, but his growing interest in artificial neural networks and software engineering eventually led him to teach computer science courses exclusively. He became chair of the Department of Mathematics and Computer Science in 1998. When the department split a year later, he was named the first chair

of the new Department of Computer Science.

Enrollment in computer science grew rapidly during the years when Dr. Fraser was chair, with the number of majors peaking at around 900 a few years ago. Dr. Fraser was the driving force behind the department's Ph.D. program, which was approved by the Board of Regents in August 2000. He was also pivotal in obtaining funds from the state's Yamacraw program, which allowed the department to hire top-notch research faculty. The number of full-time CS faculty members increased from eight in 1999 to 18 at the time of his retirement.

Dr. Fraser is the author or co-author of nearly 50 papers in statistics and computer science. His early work included collaborating with a pathologist at Kennestone Hospital, which led to a series of papers published in the *American Journal of Clinical Pathology* and *Clinical Chemistry*. Later, he co-authored a seminal paper, "Identifiability of Finite Mixtures of von Mises Distributions," which was published in *Annals of Statistics*.

Dr. Fraser's most significant computer science publications include "Informal and Formal Requirements Specification Languages: Bridging the Gap" (with K. Kumar and Vijay Vaishnavi), which was published in *IEEE Transactions on Software Engineering* in 1991. Of his most recent papers, his favorite is "Simulated Annealing Routing and Wavelength Lower Bound Estimation on Wavelength-Division Multiplexing Optical Multistage Networks," which he co-authored with Ajay Katangur and Yi Pan.

Dr. Fraser edited two books, *Advances in Control Networks and Large-Scale Parallel Distributed Processing Models* (Ablex, 1991) and *Network Models for Control and Processing* (Intellect Books, 2000). He served as an associate editor of *International Journal in Computer Simulation* (1990–1993) and was a member of the journal's editorial board from 1993 to 1997. He was principal investigator or co-PI on 14 grants.

Dr. Fraser served on many university committees over the years. Most recently, he chaired the Senate Information Systems and Technology Committee from 2002 to 2005, which included chairing the Student Technology Fee Subcommittee. He represented Georgia State on the Yamacraw Building Planning Committee and the Yamacraw Building Executive Committee.

On July 1, Dr. Fraser was given the title of Professor Emeritus. In retirement, he wants to travel more, with trips to Germany in the fall of 2005 and to Scotland in 2006. He plans to keep writing simulation applications in C and C++ ("just for fun," he says). He will also spend more time managing his investments. "If I had to do it all over again, I would have gone into finance," he says.

## RECENT PH.D. GRADUATES

**Praveen Madiraju.** *Dissertation:* Global Semantic Integrity Constraint Checking for a System of Databases. *Advisor:* Dr. Raj Sunderraman. *Current position:* Assistant Professor of Computer Science, Department of Mathematics, Statistics, and Computer Science, Marquette University. (August 2005)

**Feng Liu.** *Dissertation:* Platform Independent Real-Time X3D Shaders and Their Applications in Bioinformatics Visualization. *Advisor:* Dr. Scott Owen. *Current position:* Assistant Professor of Information Systems, College of Continuing and Professional Studies, Mercer University, Atlanta. (December 2005)

**Hui Liu.** *Dissertation:* Topology Control, Routing Protocols and Performance Evaluation for Mobile Wireless Ad Hoc Networks. *Advisor:* Dr. Yi Pan. *Current position:* Assistant Professor, Computer Science Department, Missouri State University. (December 2005)

**Haibin Wang.** *Dissertation:* Interval Neutrosophic Sets and Logic: Theory and Applications in Computing. *Advisor:* Dr. Raj Sunderraman. *Current position:* Database Administrator, Biostatistics Research and Informatics, Winship Cancer Institute, Emory University. (December 2005)

**Jiling Zhong.** *Dissertation:* Upper Bound Analysis and Routing in Optical Benes Networks. *Advisor:* Dr. Yi Pan. *Current position:* Assistant Professor of Computer Science, Troy University. (December 2005)

## DEPARTMENT ORGANIZES BIOCOMPUTING WORKSHOP

On October 27, Georgia State's SouthEast Collaborative Alliance Biocomputing Center hosted the Second SECABC Fall Workshop on Biocomputing. The goal of the workshop was to bring together researchers, developers, and students to discuss various aspects of biocomputing and their applications.

The workshop featured four keynote speakers:

- Dr. Mitra Basu, Program Director, Computer Information Sciences and Engineering Directorate, National Science Foundation
- Dr. Carmelina Ruggiero, Editor-in-chief of *IEEE Transactions on NanoBioscience*, DIST, University of Genoa, Italy
- Dr. Mark Borodovsky, Regents Professor, Georgia Institute of Technology
- Dr. Phillip Sheu, Professor and IEEE Fellow, University of California, Irvine

The workshop also included talks by eight invited speakers and a poster session with 35 posters. There were 91 registered attendees from 16 colleges and universities.

The workshop was organized by the Department of Computer Science and sponsored by the Departments of Biology and Chemistry, the BioMedical Computational Center, and the Molecular Basis of Disease Program.

The co-chairs of the workshop were Dr. Robert Harrison and Dr. Yi Pan. Many other computer science faculty members were involved in organizing the workshop, including Dr. Raj Sunderraman (registration chair), Dr. Yan-Qing Zhang (publications chair), Dr. Alex Zelikovskiy (poster chair), Dr. Anu Bourgeois (local arrangements chair), and Dr. K. N. King (publicity chair).

## FACULTY NEWS

**Dr. Anu Bourgeois**, **Dr. Martin Fraser**, and **Dr. Michael Weeks** attained Senior Member status in the Institute of Electrical and Electronics Engineers, which recognizes ten years of achievements as a member.

**Dr. Anu Bourgeois** was a co-chair of the First International Workshop on Mobile Ad-hoc and Ubiquitous Sensor Networks. The workshop was held at Nanjing University in China on November 2–5 in conjunction with the Third International Symposium on Parallel and Distributed Processing and Applications. The workshop provided a forum for researchers to exchange ideas, discuss solutions, and identify future directions for the field of wireless ad hoc and sensor networks.

**Dr. Xiaolin Hu** was a program co-chair of the DEVS Integrative M&S Symposium of the 2005 Spring Simulation Multiconference,

sponsored by the Society for Modeling and Simulation International. The symposium, which was held in San Diego on April 3–7, provided a forum for scientists and professionals to present recent developments in the theory and applications of DEVS-based modeling and simulation.

**Dr. Xiaolin Hu** was awarded a research grant from the National Science Foundation. The grant is for collaborative research between Texas A&M University and Georgia State University. 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. The three-year project started in December.

**Dr. K. N. King** served as publicity chair for the 43rd ACM Southeast Conference, which was held at Kennesaw State University on March 18–20. ACMSE, which is the oldest continuously running annual ACM conference, had the highest attendance in its 43-year history.

**Dr. Scott Owen** was elected president of ACM SIGGRAPH. His three-year term began on July 1. SIGGRAPH (Special Interest Group on Computer Graphics), which has over 6,300 members, is the world's leading organization for researchers, artists, developers, filmmakers, scientists, and other professionals who share an interest in computer graphics and interactive techniques. It is best known for the annual SIGGRAPH conference, which was attended by over 29,000 people in 2005. SIGGRAPH's parent organization is the Association for Computing Machinery, the world's first and largest computing society.

**Dr. Yi Pan** was named editor-in-chief of *International Journal of Bioinformatics Research and Applications*. Unlike many other bioinformatics journals, the new journal's objective is to publish outstanding original research papers as well as high-caliber survey papers focusing on bioinformatics research from a computer scientist's perspective.

**Dr. Yi Pan** received a research grant from the National Science Foundation for his project entitled "High Performance Rough Sets Data Analysis in Data Mining," in which he will apply high performance computing and rough sets to data mining. The three-year

project started in July.

**Dr. Yi Pan** was selected to serve on the editorial boards of *IEEE Transactions on Parallel and Distributed Systems* and *IEEE Transactions on NanoBioscience*.

**Dr. Yi Pan** delivered a keynote speech at the 2005 IEEE International Conference on Granular Computing held in Beijing on July 25–27. He was one of six keynote speakers, which included Professor Lotfi A. Zadeh, the father of fuzzy logic.

**Dr. Yi Pan** and **Dr. Alex Zelikovskiy** were co-chairs of the 2005 International Workshop on Bioinformatics Research and Applications. The workshop was held at Emory University on May 22–25, in conjunction with the International Conference on Computational Science 2005. The workshop's goal was to bring together researchers, developers, and practitioners to discuss various aspects of bioinformatics and computational biology and their applications.

**Dr. Alex Zelikovskiy** was a co-chair of the 1st ACIS International Workshop on Self-Assembling Wireless Networks. The workshop was held at Towson University in Maryland on May 23–25, in conjunction with the 6th ACIS International Conference on Software Engineering, Artificial Intelligence, Networking, and Parallel/Distributed Computing. The workshop brought together industry practitioners and researchers working on all aspects of self-assembling wireless networks.

**Dr. Yan-Qing Zhang** received the Outstanding Service Award at the 2005 IEEE International Conference on Granular Computing. The conference was held in Beijing on July 25–27.

**Dr. Yan-Qing Zhang** was a co-chair of the 2005 IEEE-ICDM Workshop on MultiAgent Data Warehousing and MultiAgent Data Mining. Ph.D. candidate Yuchun Tang served as publicity chair for the workshop, which was held in Houston on November 27, in conjunction with the Fifth IEEE International Conference on Data Mining. The workshop brought together researchers from diverse areas including data mining, data warehousing, multiagent systems, artificial intelligence, computational intelligence, machine learning, neuroscience, robot control, and other related areas to lay the foundation for MADW and MADM.

## CS FACULTY MEMBERS PROMOTED

Congratulations to the following computer science faculty members, who received promotions in 2005:

**Dr. Sushil Prasad** was promoted to Professor.

**Dr. Saeid Belkasim** was promoted to Associate Professor with tenure.

**Dr. Michael Weeks** was promoted to Associate Professor with tenure.

## STUDENT ACHIEVEMENTS

**Bo Jin**, a Ph.D. candidate advised by Dr. Yan-Qing Zhang, won a best student paper award at the 2005 IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology. The symposium was held on November 14–15 in San Diego.

**Yuchun Tang** and **Bo Jin**, two Ph.D. candidates advised by Dr. Yan-Qing Zhang, participated in the Data Mining Cup Contest 2005. 531 students from 176 universities in 41 countries took part in the competition, which lasted from April 1 to April 30. More than 160 solution models were submitted. Mr. Tang's solution ranked 19th (1st in the U.S.) with 10722 points, and Mr. Jin's solution ranked 27th (3rd in the U.S.) with 10175 points; the top-ranked solution received 12297 points. This year's Data Mining Cup Contest dealt with the problem of using data mining to determine whether a person who places an order online will eventually pay for the goods they ordered.

**Haibin Wang**, a recent Ph.D. graduate, is the primary author of a monograph titled *Interval Neutrosophic Sets and Logic: Theory and Applications in Computing*. His co-authors were two CS faculty members, Dr. Raj Sunderraman and Dr. Yan-Qing Zhang, along with Dr.

Florentin Smarandache of the University of New Mexico. The monograph can be purchased in book form or downloaded as a PDF file.

## UPCOMING EVENTS

On May 10–12, 2006, the department will host the 2006 IEEE International Conference on Granular Computing. 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. The conference is sponsored by the IEEE Computational Intelligence Society. Dr. Yi Pan is one of the conference's general co-chairs, Dr. Yan-Qing Zhang is a co-chair of the program committee, Dr. K. N. King is a publicity co-chair, and Dr. Anu Bourgeois and Dr. Raj Sunderraman are local arrangements co-chairs.

## 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

Hsiu-Chung Wang

### Outstanding Graduate Research Award

Bo Jin  
Wei Zhong

### Outstanding Teaching by a Graduate Student Award

Hui Liu  
Hao Tian

The ceremony was held on April 14 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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