I am delighted to report a year of exciting achievements for the Computer Science Department. In 2001-02, when Purdue announced a visionary plan to shape its destiny as a university with few peers in the sciences and engineering, the CS faculty worked on identifying strategic initiatives that complement and enhance the goals of the university. I want to share a summary, outlined below, of the faculty plan that resulted from these efforts, a plan that looks into the future of computing and strengthens the department’s forty-year tradition of fostering groundbreaking research and providing an outstanding computer science education for its students.

As charted in the faculty strategic plan drafted this year, the department is focusing its efforts to build on strengths in its core areas: Computational Science and Engineering; Databases; Graphics, Visualization, and Geometric Modeling; Information Security; Networking, Operating Systems, and Distributed Systems; Programming Languages and Compilers; Software Engineering; and Theory of Computing and Algorithms.

Four research thrusts have been identified for future growth:
- Computational Biology and Nanotechnology
- Critical Infrastructure Protection
- Massive Data Handling
- Pervasive Computing

An exceptional faculty is a hallmark of Purdue Computer Science. We are pleased to welcome three outstanding new members of our faculty:
- Gopal Pandurangan, Assistant Professor; design and analysis of algorithms, with a focus on communication networks, Internet algorithms, and computational biology.
- Suresh Jagannathan, Associate Professor; semantics and implementation of high-level programming languages and distributed languages.
- Jeff Vitter, the Frederick L. Hovde Dean of the School of Science and Professor of Computer Science; algorithms, with a focus on external memory computations.

Our faculty and staff had a successful year. Recent faculty recognitions include:
- NSF Career Award: Walid Aref
- Ten Best Teachers in the School of Science recognitions: Buster Dunsmore and Jens Palsberg
- School of Science Outstanding Undergraduate Teaching Award: Ananth Grama
- University Faculty Scholar Award: Ananth Grama
- Fellow of Purdue Teaching Academy: Eugene Spafford
- Fellow of IEEE: Eugene Spafford
- Schlumberger Foundation Technical Merit Award: Sonia Fahmy

Our graphics faculty, under the leadership of Chris Hoffmann, plays a leading role in the University’s new Envision Center and was instrumental in the highly recognized September 11 Pentagon Attack Simulation.

The 956 undergraduate majors enrolled in Fall 2002 are the brightest and most talented students the department has ever had, with an average SAT score of 1228. Our 203 graduate students represent the largest graduate program the department ever had. The department awarded 151 B.S., 36 M.S., and 8 Ph.D. degrees in 2001/02.

The department ranked 20th in the most recent U.S. News and World Report. It was in the 50th ranked cluster tied with Columbia, Duke, Harvard, and UC San Diego.
The department’s development efforts were strong. The 26 participating companies in the Corporate Partners Program (CPP) supported scholarships and special programs with gifts totaling $1.3 million. Contributions from alumni and friends equaled $200,000. The campaign to raise gifts and pledges for our new building continues to move forward despite a struggling economy; groundbreaking will commence when the total of $20 million in funds needed for Phase I of the new facility are secured—and we make progress each month toward that goal.

In closing, let me say that it is an honor to follow Prof. Ahmed Sameh as the head of the Department of Computer Sciences. My colleagues and I are thankful for his service and leadership to the department.

Susanne E. Hambrusch

PS. Your comments and input are most welcome!
Please write us at annual-report@cs.purdue.edu.

Samuel D. Conte, who founded the Department of Computer Sciences in 1962, passed away July 1, 2002. He was 85. Conte served as head of the department for 17 years and continued teaching until 1993.

“Samuel Conte was at the leading edge of one of the most important scientific developments of the 20th century,” said Purdue president Martin C. Jischke. “He was one of the first to recognize the role the computer could play in teaching and research, as well as in business. His vision and leadership have had a profound impact on Purdue and our world.”
Purdue University

Founded in 1869 as Indiana’s land-grant university, Purdue is a public, doctoral-granting research university with just over 38,000 students on its West Lafayette campus, choosing from more than 6,100 courses in over 200 fields of study. Students come from 50 states and 130 countries. Purdue enrolls more international students than any public university in the United States.

Purdue’s research and learning environment is a birthplace of great ideas and accomplishments where faculty and students discover together, push the boundaries of knowledge, and make significant contributions to virtually every aspect of contemporary life. Extensive library, computing, and laboratory resources support the robust research and learning setting and provide multiple opportunities to explore interests and develop skills. More than 325,000 living alumni are graduates of one of the University’s highly-regarded 10 schools – Science, Engineering, Management, Pharmacy, Nursing, Consumer and Family Sciences, Liberal Arts, Agriculture, Veterinary Medicine, and Technology – and are making a difference each day in myriad fields. Visit http://www.purdue.edu for more information.

Greater Lafayette

The home of Purdue, Greater Lafayette is a friendly, spirited community located on Interstate 65, 150 miles southwest of Chicago and 65 miles northeast of Indianapolis. West Lafayette and Lafayette, situated along the scenic Wabash River in Tippecanoe County, are home to a total population of just over 150,000 people who enjoy a strong economic base, historic architecture, excellent schools, well-maintained parks, biking, and hiking trails, and several fine restaurants. The local arts scene, including performances by international artists presented throughout the year at Purdue, is thriving. Residents enjoy the changes of four seasons with an average mean temperature in January of 23 degrees and 73 degrees in July. For more information, visit http://www.lafayette-in.com.
The Department of Computer Sciences at Purdue was the first degree program in Computer Science in the nation. Computer Science offers challenging BS, MS, and Ph.D. programs for over 900 undergraduate and 200 graduate students.

The 37 faculty members (34 full-time equivalents) are involved with teaching and research interests that span most of Computer Science, and include analysis of algorithms and theory of computation; compilers and programming languages; databases; geometric modeling and scientific visualization; information security; networking and operating systems; scientific computing; and software engineering. For more information, see http://www.cs.purdue.edu/faculty.

Computer Science Department Facilities
The department is dedicated to providing high-quality computing facilities for use by computer science faculty, students, and administrative personnel. The facilities are operated by a technical staff who are not only responsible for the installation and maintenance of the systems, but who also assist faculty and students in the development of software systems for research projects. The staff includes a director, facilities manager, administrative assistant, one network engineer, one hardware engineer, six system administrators, and several student assistants.

General Facilities
General computing facilities are available for both administrative activities (such as the preparation of research reports and technical publications) and research needs that are not supported by other dedicated equipment. The main systems each have 512 MB to 4 GB of main memory and a total of over 500 GB of disk storage. All faculty and many graduate students have a Sun, Intel, or Silicon Graphics workstation on their desk.

Educational Facilities
Computing systems used by students enrolled in both undergraduate and graduate computer science courses include over 100 Intel PCs running either Sun Solaris x86 or Windows XP. Four rooms in the Computer Science Building, two rooms in the Physics Building and a room in the Recitation Building are dedicated to laboratory-based instruction using these facilities. A later section lists equipment owned and maintained by ITaP but used by computer science students.

I/O Equipment
The department operates both special-purpose output devices as well as general output equipment, including about 70 laser printers, color printers, color scanners, video projectors, digital video editing capabilities, and video conferencing equipment.

Networking Services
The department is strongly committed to state-of-the-art networking technology to provide access to and communication among its systems, as well as to those elsewhere on campus and throughout the world. Over twenty-five 10 Mbps and 100 Mbps Ethernet hubs and switches included in the Computer Science Building connect the workstations to the departmental computing facilities. Experimental wireless networks are also used in the building. A fiber-optic ATM link connects departmental systems to other systems on campus, as well as to the Internet community via both “commodity” and Internet2/Abrilene connections. ISDN and ADSL services are in use for remote access from a number of nearby sites.

Information Technology at Purdue (ITaP)
In addition to the facilities described above, students and faculty have access to computing systems owned and operated by ITaP. General instructional facilities operated by ITaP include large Sun SPARC servers and several Sun and Intel workstation laboratories. In addition, ITaP provides systems for use in courses taught by the CS Department. These systems include UNIX-based Sun SPARC stations for undergraduate computer science courses and Microsoft Windows-based Intel personal computers for use in an introductory course for non-majors (CS 110). Departmental research projects make use of other facilities provided by ITaP, including a large IBM SP cluster.
Courses

110 Introduction to Computers
152 FORTRAN Programming for Engineers
154 FORTRAN Programming
156 C Programming for Engineers
158 C Programming
178 Introduction to Computer Science
180 Programming I
181 Programming II
184 Foundations of Computer Science
195W Introduction to the Internet and the World Wide Web
192 Freshman Resources Seminar
197 Freshman Honors Seminar
235 Introduction to Organizational Computing
240 Programming Laboratory (C)
250 Computer Architecture
251 Data Structures
314 Numerical Methods
316 Numerical Methods
328 Information Systems
352 Compilers: Principles and Practice
354 Operating Systems
381 Introduction to the Analysis of Algorithms
397 Honors Seminar
406 Software Engineering I
422 Computer Networks
426 Computer Security
435 Interactive Computer Graphics
438 Introduction to Relational Database Systems
490B Introduction to Bioinformatics
491 Senior Resources Seminar
492 Introduction to Computational Science
500 Compiling and Programming Systems
503 Operating Systems
510 Software Engineering
514 Numerical Analysis
530 Introduction to Scientific Visualization
535 Interactive Computer Graphics
536 Data Communication and Computer Networks
541 Database Systems
542 Distributed Database Systems
543 Introduction to Simulation and Modeling of Computer Systems
550 Cryptography
555 Programming Languages
580 Algorithm Design, Analysis, and Implementation
590C Topics in Computational Molecular Biology
590D Advanced Topics in Parallel and Distributed Computing
590E Recent Trends in Database Systems
590F Topical Lectures in Information Security
590G Image-Based 3D Computer Graphics
590H Security Issues in Data Mining
590I Network Processor Systems
590J Topics in QoS-Sensitive Networked Services
590K Computer Graphics Frontiers
590L Analysis of Algorithms on Sequences
601 Advanced Topics in Distributed Systems
616 InterNetworking
621 Formal Computing Methods
690 Handheld Devices and Embedded Systems
Purdue's plan for preeminence in science and engineering

Purdue University stands at the door of unparalleled promise. Building on its great tradition of excellence, Purdue has launched strategic initiatives that, when fully implemented, will create a truly exceptional, multi-disciplinary research and learning setting for the sciences and engineering, an environment that will be celebrated as preeminent among researchers, scientists, and scholars around the world.

In September 2002, Purdue announced a campaign to raise $1.3 billion to provide the resources to finance these strategic initiatives in learning, discovery, engagement, and facilities. Included in the University’s campaign is the important effort to fund and construct Phases I and II of a $36 million building for Computer Science.

The critical challenge facing Computer Science today is space

In concert with Purdue’s goal of preeminence, Computer Science has set out on a path to become a top ten CS program.

Now ranked at #20, Purdue Computer Science – the first degree program in Computer Science in the nation – is already a first class program. The objective is to build on its strengths to become even better. To accomplish this strategic goal, the essential first step is to increase faculty size – to attract, hire, and retain additional faculty who have achieved international distinction and provide them with computing facilities, space, and administrative staff that support a superlative research and learning environment.

However, making significant, measurable progress toward accomplishing the goal of hiring more faculty is problematical because, quite simply, Computer Science has run out of space. Thirty-four (34) CS faculty have research, instructional, and office space in five (5) separate buildings on the West Lafayette campus, teaching and doing research with over one thousand (1,000) students. This situation must change. Purdue understands that the time has come to build a facility that reflects its quest for preeminence in Computer Science.

Impact of a new Computer Science building

The impact of a new Computer Science building will be immediate and far-reaching. First, in its new home, Computer Science will be a magnet for the world's brightest minds in the field and achieve a competitive advantage in growing its faculty.

Second, outstanding students will follow great faculty and continue to be drawn to Purdue Computer Science. In a new building, students will gain by taking coursework in smaller, state-of-the-art classrooms. They will be taught more often by faculty, and less often by teaching assistants. And they will interact in team environments, completing projects and solving inter-disciplinary problems in larger, well-equipped research labs and breakout spaces.

Third, and of utmost importance, a new Computer Science facility will help Purdue attain the preeminent multi-disciplinary teaching and research milieu it is striving to achieve, a setting in which students – the scientists and engineers of the future – come together alongside exceptional professors to learn, discover, and ultimately find solutions that can lead to applications of immense benefit for the world. Emerging technology research with potential for important applications is already underway at Purdue, and will accelerate with a new Computer Science building.

In a year of continuing turmoil in world financial markets, alumni and friends of the department made building campaign commitments that totaled $2 million by year end. Phase I of the new CS facility at Purdue will cost $20 million – to be funded with $7 million in contributions from individuals, and $13 million from the state of Indiana. Groundbreaking for the project will be set when the remaining $5 million in private support is secured.
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Laura & Daniel Niepeier

Continued on page 11

Development of Private Support
Gifts from individual and corporate friends in 2001-02 provided the critical edge,

enabling the department to meet and expand its learning and research goals. By June 30, 2002, contributions totaling $1,520,291 were received from these generous donors.

Donor Honor Roll

Continued on page 11
The Corporate Partners Program (CPP) is a program encouraging corporate involvement in the Department of Computer Sciences. Companies, which participate at membership tiers by making unrestricted donations, are involved in the everyday activity of the department. They have opportunities to speak in classes, sponsor student projects, and otherwise make contact with CS students and faculty. Members of the CPP include giants of the IT industry as well as smaller, specialized companies. Partner members represent companies in Indiana as well as across the United States. The diverse membership offers information and guidance about the vast career opportunities available to computer science students.

The Corporate Partners meet twice each year to provide input and feedback to departmental and school leadership. Recent contributions of the council include assistance in revising the undergraduate and graduate curriculums, insight in drafting the departmental strategic plan, ideas regarding retention and enrollment issues, collaborative efforts with faculty and student research, as well as alerting the department to industry areas of concern.

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- Guidant Corporation » Jim Mapel
- IBM » Ko-Yang Wang
- Intel Corporation » Kevin Kahn
- Lockheed Martin » Richard Schubert
- Microsoft Corporation » John Spencer
- Motorola » John Kinyon

Partners
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- The Boeing Company » Bob Byrne
- Cottico » Don Shaffner
- Cisco Systems » Dale Miller
- Harris Corporation » Jim Clamons
- Hewlett Packard » Janice Zolkus
- Lucent Technologies » Jack Kozak
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- Raytheon Systems Company » Jerry Slater
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- Kimberly-Clark Corporation » Rick Grayske
- Procter & Gamble » Tom Nylen
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<tr>
<th>Date</th>
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<tr>
<td>FALL 2001</td>
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<tr>
<td>Aug. 30</td>
<td>Dennis Antonioli</td>
<td>Canoo Engineering</td>
<td>Compact Wire-Formats for Java Programs</td>
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<td>Sep. 10</td>
<td>Urs Holide</td>
<td>Google Inc.</td>
<td>Google – Linux-Casting for Fun and Profit</td>
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<td>Suresh R. Das</td>
<td>Ohio University</td>
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<td>John Grifith</td>
<td>NITE Corporation</td>
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<td>IC IRS</td>
<td>Sensitive Mobility in the GMC-Lution</td>
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<td>Sep. 24</td>
<td>Matt Mason</td>
<td>Carnegie-Mellon University</td>
<td>Automated Manufacturing and Robotics Juggling</td>
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<td>Sep. 28</td>
<td>Matthew Pratt</td>
<td>University of Utah</td>
<td>Programming Language Support for Software Components</td>
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<td>Kariem Sherif</td>
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<td>IBM TJ Watson Research Lab</td>
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<td>Nankai Institute of Technology</td>
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<td>Guy Germaine</td>
<td>EPFL, Lausanne</td>
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<td>Aviel D. Rubin</td>
<td>AT&amp;T Labs</td>
<td>Public: A Robust, Tamper-Evident, Censorship-Resistant Web Publishing System</td>
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<td>Nov. 29</td>
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<td>QoS Routing for Next Generation High Speed Network Challenges and Solutions</td>
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<td>Jan. 28</td>
<td>Larry Smarr</td>
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<td>Feb. 7</td>
<td>Maria Papadopoulou</td>
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<td>Information Dissemination and Resource Sharing in Mobile, Ad Hoc Networks</td>
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<td>Marian (Tanya) Rietveld</td>
<td>Rutgers University</td>
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<td>Feb. 26</td>
<td>Gary T. Leavens</td>
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<td>A Java Modeling Language and Simulation Framework for Inheritance</td>
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<td>Mar. 7</td>
<td>Michael Honeck</td>
<td>Univ. of IL Urbana-Champaign</td>
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<td>David M. Reed</td>
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<td>Mar. 18</td>
<td>Andrew Bland</td>
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<td>Mar. 21</td>
<td>Steve Zilberstein</td>
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<td>Mar. 21</td>
<td>Stephen Schloss</td>
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<td>Mar. 25</td>
<td>Saroj Mathia</td>
<td>Univ. of Missouri – Rolla</td>
<td>Multi-version Transaction Model to Improve Data Availability in Mobile Computing</td>
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<td>Martin Karsten</td>
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<td>Quality of Service in Networks – From Passive to Reactive Resource Allocation</td>
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<td>Mar. 29</td>
<td>Young Kim</td>
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<td>Distributed Edge-to-Edge Throughput Monitoring Methods to Manage Bandwidth Usage in Distributed Service Networks</td>
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<td>Rudi Kellera</td>
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<td>Apr. 4</td>
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<td>Apr. 8</td>
<td>Ekaterina Ska</td>
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<td>David Holmes</td>
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<td>Gopal Prabhakaran</td>
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<td>Suhas Kaveri</td>
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<td>Philip E. Alkire</td>
<td>Michigan State Univ.</td>
<td>Design and Use of Adaptive Components in RPA Software</td>
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<td>Suresh Jagannathan</td>
<td>Storage Networks, Inc.</td>
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<td>Armand M. Nakiboun</td>
<td>University of Maryland</td>
<td>Queue Dynamics at RED Gateways Under a Large Number of Flows</td>
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<td>Apr. 27</td>
<td>Fabrizio A. Santuccio</td>
<td>Georgia Institute of Technology</td>
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<td>Apr. 29</td>
<td>Laszlo G.</td>
<td>Signum Consulting</td>
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<tr>
<td>Apr. 30</td>
<td>Michel Dugnain</td>
<td>University of Montreal</td>
<td>Performance Evaluation on Linux</td>
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</tbody>
</table>
Department
Susanne Hambrusch » Department Head
Jens Palsberg » Associate Head
John T. (Tim) Korb » Assistant Head
Paula Perkins » Administrative Assistant

Business Office
Mary Bell » Business Manager
Linda Byfield » Account Clerk
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Mary Jo Bartolacci » Director of Development
Jean Jackson » Corporate Relations
Pat Morgan » Secretary

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Brian Board » Hardware
Ron Castonga » Facilities Manager
Charles Fultz » UNIX Software
Kip Granson » Windows Software
Nathan Heck » Windows Software
Nick Hirschberg » Webmaster and DBA
Mike Motuliak » Hardware
Steve Plite » UNIX Software
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K. C. VanZandt » Instructor
Connie Wilson » Department Secretary
Bill White » Instructor

Undergraduate Office
Patricia Giordano » Advisor
Mary-Ann Neel » Advisor
Janice Thomaz » Advisor
Professor Abhyankar is a fellow of the Indian Academy of Science and an editorial board member of the Indian Journal of Pure and Applied Mathematics. He has won numerous awards and honors. Before coming to Purdue, he was an associate professor of mathematics at Johns Hopkins University and came to Purdue as a full professor. In 1987, he was appointed the Marshall Distinguished Professor of Mathematics.

His research areas of interest included algebraic geometry, commutative algebra, local algebra, theory of functions of several complex variables, quantum electrodynamics, circuit theory, invariant theory, combinatorics, computer-aided design, and robotics. His current research is in the area of computational geometry and algorithmic algebraic geometry.

**SELECTED PUBLICATIONS**


A. Apostolico and S. Lonardi, "Reconstructing Digital Images from Partial Information", Theoretical Computer Science, Journal of Computational Biology, Chaos Theory and Applications, and was guest editor for a special issue of Algorithms on string algorithms and their applications.

He also serves on the steering committee of the International Symposium on Combinatorial Pattern Matching, the proceedings of which he co-edited in 1993, 1994, and 1997 on the executive committees of the Fibonacci Institute for the Foundations of Computer Science and of the MSE Program in Software Engineering. He has served on the program committees of many international conferences, most recently, the International Colloquium on Automata, Languages, and Programming, the IEEE Data Compression Conference, the IFIP Conference on Parallel Algorithms for Irregularly Structured Problems, the Workshop on Algorithms and Data Structures, Research in Computational Biology (RECOMB), and as an invited speaker at various international conferences and advanced schools.

**David C. Anderson**

> Professor of Mechanical Engineering and Computer Science (1972)
> Ph.D., Purdue University, 1974

Professor Anderson conducts research and teaches in the areas of computer-aided design, computer graphics and mechanical engineering design. His research focuses on problems in intelligent manufacturing systems, computer-aided engineering, design environments, high level shape representation, geometric modeling, and geometric reasoning.

He is currently deputy director and co-principal investigator of the National Science Foundation Engineering Research Center (ERC) for Collaborative Manufacturing, and chairman of the Mechanical Engineering Design Area. He is a member of the editorial boards of the Journal of Research in Engineering Design and the Journal of Design and Manufacturing.

Dr. Anderson is a Fellow of the ASME.

Professor Apostolico’s research interests are in the areas of algorithmic analysis and design and parallel computation. His recent work deals with algorithms and data structures for combinatorial pattern matching problem as arising in text editing, data compression, picture processing, biomolecular sequence analysis, etc. He is a co-editor (with Z. Galil) of the books Combinatorial Algorithms on Words (Springer-Verlag) and Pattern-Matching Algorithms (Oxford Univ. Press), serves on the editorial boards of Parallel Processing Letters, Theoretical Computer Science, Journal of Computational Biology, Chaos Theory and Applications, and was guest editor for a special issue of Algorithms on string algorithms and their applications.

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**SELECTED PUBLICATIONS**


Professor Atallah’s research involves both theoretical and experimental studies in distributed systems. His research group has implemented a robust and adaptable distributed database system called RAID, an adaptable video conferencing system and is involved in networking research using ideas of active routers, diffusors, and mobiles. Prof. Bhargava has conducted experiments in large scale distributed systems, communications, authentication, key management, fault-tolerance and Quality of Service. He is conducting experiments with large scale communication networks to support emerging applications such as digital library and multimedia databases. His current interests are in secure mobile systems, multimedia security and QoS as a security parameter.

Chris Bailey-Kellogg’s research focuses on intelligent systems in computational science and engineering. In the area of computational biology, he is pursuing a mixed computational-experimental approach to the structural and functional understanding of and control over the molecular machinery of the cell. He is developing algorithms and systems to automatically plan experiments, predict outcomes, interpret data, revise models, and so forth. In the area of qualitative reasoning about physical systems, he is focusing on analysis of spatially distributed data, for example, in phase portrait representations and for decentralized control design. He is developing and applying a general framework that navigates a hierarchy from input data to abstract description and back, using a mixture of numeric, symbolic, and geometric reasoning.

**SELECTED PUBLICATIONS**

SELECTED PUBLICATIONS
Bharat Bhargava, "Concurrency Control in Database Systems", IEEE Transactions on Knowledge and Data Engineering (TKDE), Vol. 11, No. 1, pages 3-16, January 1999.

Chris Clifton
- Associate Professor of Computer Science (2001)
- B.S. in Computer Science and Engineering, M.I.T., 1986
- M.A. in Computer Science, Princeton, 1988
- M.S. in Electrical Engineering and Computer Science, M.I.T., 1986
- Ph.D. in Computer Science, Princeton, 1991

Dr. Clifton works on challenges posed by novel uses of data mining technology, including data mining of text; data mining techniques applied to interoperupon of heterogeneous information sources, and security and privacy issues raised by data mining. Fundamental data mining challenges posed by these applications, include extracting knowledge from noisy data, identifying knowledge in highly skewed data (few examples of "interesting" behavior), and limits on learning. He also works on database support for widely distributed and autonomously controlled information, particularly information administration issues such as supporting fine-grained access control.

Prior to joining Purdue, Dr. Clifton was a Principal Scientist in the Information Technology Division at the MITRE Corporation. He has a Ph.D. from Princeton University, and Bachelor’s and Master’s degrees from the Massachusetts Institute of Technology. Before joining MITRE in 1995, he was an Assistant Professor of Computer Science at Northwestern University.

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Prior to joining Purdue, Dr. Clifton was a Principal Scientist in the Information Technology Division at the MITRE Corporation. He has a Ph.D. from Princeton University, and Bachelor’s and Master’s degrees from the Massachusetts Institute of Technology. Before joining MITRE in 1995, he was an Assistant Professor of Computer Science at Northwestern University.
Dr. Dunsmore is a 1996 recipient of the Charles B. Murphy Outstanding Undergraduate Teacher Award for Purdue University. He was selected in 1996 as a member of the Purdue University chapter of Mortar Board (national honor society that recognizes college students and faculty for their achievements in scholarship, leadership, and service). He was nominated in 1996 by Purdue University for the Carnegie Foundation U.S. Professor of the Year program. He was chosen as a Founding Fellow of the Purdue University Teaching Academy in 1997. He was selected Outstanding Teacher in the School of Science at Purdue University in 1996. Dr. Dunsmore was selected one of the Top Ten Teachers in the School of Science in 1994, 1995, and 2000. He is a member of the Phi Beta Kappa and Upsilon Pi Epsilon (honor society for the computing sciences). On May 8, 2001, Dr. Dunsmore was selected as one of three Outstanding Indiana Information Technology Educators by the Indiana Information Technology Association (INITA).

Dr. Dunsmore has extensive legal and industrial consulting experience. He has written over 40 technical articles. He is coauthor of the books Software Engineering Metrics and Models (with Sam Conte and Vincent Shen) and Internet Resources for Tourism and Leisure (with William Theobald).


SELECTED PUBLICATIONS

Ahmed Elmagarmid
- Professor of Computer Science (1988)
- B.S., Computer Science, University of Dayton, 1977
- M.S., Computer and Information Science, The Ohio State University, 1981
- Ph.D., 1985

Professor Elmagarmid is the Director of the Indiana Center for Database Systems and the Indiana Telemedicine Incubator. He received a Presidential Young Investigator award from the National Science Foundation, and distinguished alumini awards from The Ohio State University and the University of Dayton in 1993 and 1995, respectively. Professor Elmagarmid is the editor-in-chief of Distributed and Parallel Databases: An International Journal, editor of IEEE Transactions on Knowledge and Data Engineering, Information Sciences Journal, Journal of Communication Systems, and editor of an international series on Advances in Database Systems. He has chaired and served on several program committees and served on several editorial boards.

Professor Elmagarmid’s research interests focus on applications of database technology to teledicine, digital government, and electric power management. He has done work in video databases, data quality and confidentiality, and multidatabase systems. He has over 50 active grants from state and federal government agencies as well as several grants from industry.

Professor Elmagarmid serves as an industry consultant in the areas of database systems. He has consulted with Tericordia Technology, Bellcore, IBM, CSC, Harris, D. R. Brown and Associates, NCC, Bell Northern Research, Molecular Design Labs, and UniGp to name a few. He is the owner of a recent patent on workflow database technology.

SELECTED PUBLICATIONS

Sonia Fahmy’s research interests are in sensor networks, and network security. She has been very active in the Traffic Management working group of the ATM Forum, and has participated in several IRTF and IETF working groups. Her work is published in over 40 papers, including publications in IEEE/ACM Transactions on Networking, Computer Networks, IEEE INFOCOM, IEEE ICNP, and ACM NOSSDAV. Some of the results of her work were incorporated in the ATM Forum traffic management specifications 4.0 and 4.1, and a patent has been awarded for her work on the ERICA algorithm for network congestion control. She is a member of the ACM, IEEE, Phi Kappa Phi, Sigma Xi, and Upsilon Pi Epsilon. She received the Schlumberger foundation technical merit award in 2000 and 2001, and the OSU presidential fellowship for dissertation research in 1998. She has served on the technical program committees of IEEE INFOCOM, ICM, ICC, ICDCS, and GLIEBEA, chaired the tutorials for IEEE Hot Interconnects, and co-chaired the first SPIE conference on scalability and traffic control in IP networks in 2005.

SELECTED PUBLICATIONS

Greg Frederickson

> Professor of Computer Science (1982)
> A.B., Economics, Harvard University, 1969
> M.S., Computer Science, University of Maryland, 1976
> Ph.D., Computer Science, University of Maryland, 1977

Professor Frederickson’s areas of interest include the analysis of algorithms, with special emphases on data structures, and graph and network algorithms. His recent work has focused on designing data structures to dynamically maintain information about graphs, on designing optimal algorithms for parametric search problems on trees, and on discovering graph decompositions that facilitate fast algorithms for shortest path problems. Professor Frederickson has served on the editorial boards of SIAM Journal on Computing, SIAM Journal on Discrete Mathematics, and IEEE Transactions on Computers, and he currently serves on the editorial board of Algorithmica. He has published two books, Dissections Plane & Fancy, Cambridge University Press, 1997, and Hinged Dissections: Swinging & Twisting, Cambridge University Press, 2002.

SELECTED PUBLICATIONS
An Introduction, published by Morgan Kaufmann, Inc.
He is on the editorial boards of
- Journal for Symbolic Computation
- Journal for Applicable Algebra
- International Journal of Computational Geometry and Applications
- Computer-Aided Geometric Design
- Computer Aided Design
- ACM Transactions on Graphics
- Computer Graphics, Vision and Image Processing
- SIAM Monographs in Science and Engineering
- Computer Graphics Forum

SELECTED PUBLICATIONS

Chris Hoffmann

- Professor of Computer Science (1974)
- Ph.D., University of Wisconsin, 1974

Before joining the Purdue faculty, Professor Hoffmann taught at the University of Waterloo, Canada. He has also been visiting professor at the Christian-Albrechts University in Kiel, West Germany (1980), and at Cornell University (1984-1986). His research focuses on geometric and solid modeling, its applications to manufacturing and science, and the simulation of physical systems. The research includes, in particular, research on geometric constraint solving and the semantics of generative, feature-based design. Professor Hoffmann is the author of Group-Theoretic Algorithms and Graph Isomorphism, Lecture Notes in Computer Science, 136, Springer-Verlag and of Geometric and Solid Modeling:

SELECTED PUBLICATIONS

Susanne Hambrusch

- Department Head
- Professor of Computer Science (1982)
- M.S., Computer Science, Technical University of Vienna, 1977
- Ph.D., Computer Science, The Pennsylvania State University, 1982

Professor Hambrusch’s research interests are in the area of parallel and distributed computation, data management and data dissemination in wireless environments, and analysis of algorithms. Her research contributions include parallel algorithms for image processing and graph problems, communication and data dissemination routines for distributed applications, and data management techniques for query processing in wireless, mobile environments. Professor Hambrusch’s research has been supported by NSF, ONR, DARPA, DoD, and Microsoft Corp. Professor Hambrusch is a member of the Editorial Boards of Parallel Computing and Information Processing Letters and a member of the IEEE Technical Committee on Parallel Processing (TCPP). She has held visiting positions at the International Computer Science Institute, Berkeley, and at the Technical University of Graz, Austria. Professor Hambrusch is an inaugural member in Purdue University Book of Great Teachers and was selected in 1999 as one of the Ten Best Teachers of Undergraduates. Since July 2002, she serves as the head of the Department of Computer Sciences.

SELECTED PUBLICATIONS

Tony Hosking

- Associate Professor of Computer Science (1995)
- B.Sc., Mathematical Sciences, University of Adelaide, 1985
- M.Sc., Computer Science, University of Waikato, 1987
- Ph.D., Computer Science, University of Massachusetts, 1995

Dr. Hosking’s research lies at the intersection between programming languages and database systems, focusing on the integration of language and database functionality for efficient data management. Particular topics of interest include interpretation, compilation, and optimization of object-oriented persistent /database programming languages, and empirical performance evaluation of experimental prototype systems. His current research explores language and compiler support for run-time object management (e.g., garbage collection, persistence, resilience, distribution and security) in the context of the Smalltalk, Modula-3, and Java programming languages.

SELECTED PUBLICATIONS
E.N. Houstis served as acting and associate head of the Department of Computer Sciences for several years. Houstis is on the editorial board of Neural, Parallel and Scientific Computation, Computational Engineering Science, and HPC Users Web-Based Journals and a member of the IFIP WG 2.5 Working Group in Numerical Software. Houstis’s current research interests are in the areas of problem solving environments (PSE), parallel computation, performance evaluation and modeling, computational intelligence, computational finance, and on-line learning. He is one of the principal designers of several domain specific PSEs (e.g., Parallel ELLPACK, PDELab) and numerous performance evaluation studies of PSE software and parallel architectures. He is leading the Parallel ELLPACK group which is developing infrastructure and implementing methodologies for reusing “legacy” PDE software on a variety of physical and virtual parallel machines and designing a Web Parallel ELLPACK server. Houstis has been involved in the designing of a knowledge based framework (known as PYTHIA) to support the selection of algorithms and machine pairs for a given class of PDE problems based on performance knowledge. This framework has been applied to a simulation system for designing HPC systems (known as POEMS project), a virtual laboratory environment, and recommender system for mathematical software. He has published several books and over 120 technical articles. He has supervised 14 Ph.D. students and several MS students. His research has been supported by the Air Force Office of Scientific Research, the Army Research Office, DARPA, DOE, ESPIIT, IBM, AT&T, Kozo-Japan, Purdue University, National Science Foundation, Greek Research Foundation, DOE, ESPRIT, INTEL, IBM, AT&T, Kozo-Japan, Purdue University, National Science Foundation, Greek Research Foundation.

Suresh Jagannathan
» Associate Professor of Computer Science (2002)
» B.S., Electrical Engineering (1980)
» Ph.D., Computer Science (1985)

Prof. Jagannathan is interested in the semantics and implementation of high-level programming languages like SML, Scheme, or Java. More specifically, his interests lie in formal methods for describing and implementing such languages, e.g., type theory, flow analysis, abstract interpretation, etc. Building optimizing compilers using formal systems derived from types or control flow analysis is a main goal of this research.

Besides work on compiler design and implementation, he also has an active interest in coordination and distributed languages. More specifically, his research studies the application of language abstractions and implementation techniques successfully developed for functional languages like SML to coordination and distributed languages.

More recently, he has been actively involved in applying formal methods and software engineering principles to the design, specification, and implementation of large-scale storage systems. This work includes research on advanced communication infrastructure and management of distributed storage architectures for database systems. His current work expands upon this experience to develop next-generation storage applications focused on transparent archival and versioning services for SAN environments.

SELECTED PUBLICATIONS


Zhiyuan Li
» Associate Professor of Computer Science (1999)
» B.S., Mathematics, Xiamen University, China, 1982
» M.S., Computer Sciences, University of Illinois, Urbana, 1985
» Ph.D., Computer Sciences, University of Illinois, Urbana, 1989

Zhiyuan Li has led a group to design and implement an interprocedural parallelizing Fortran compiler, called Panorama, which performs highly efficient array data flow analysis to enable aggressive loop parallelization and locality-enhancement program transformations. Li collaborates with a group at the University of Minnesota to build the Agassip C compiler to perform similar task-level programs.

Li received a National Science Foundation Research Initiation Award and a National Science Foundation Career Award in 1992 and 1995 respectively. In 1998, he co-edited with P.C. Yeung a special issue on Compilers and Languages for Parallel and Distributed Computers for IEEE Transaction on Parallel and Distributed Systems and two special issues on Compilers and Languages for Parallel Computing for the International Journal on Parallel Programming. Li, with P.C. Yeung, co-chaired the sixth International Workshop on Languages and Compilers for Parallel Computing in 1997. He has served a program committee member for several international conferences, including IEEE/ACM International Parallel Processing Symposium (IPPS/SPDS), ACM International Conference on Supercomputing and International Conference on Parallel Processing.

SELECTED PUBLICATIONS


Robert Lynch

» Professor Emeritus of Computer Science and Mathematics (1967)
» B.S., Engineering Physics, Cornell University, 1954
» M.A., Mathematics, Harvard University, 1961
» Ph.D., Applied Mathematics, Harvard University, 1963

Professor Lynch has held positions at Brookhaven National Laboratory, Los Alamos Laboratories, Wright-Patterson Air Force Base, the University of Texas, and General Motors Research Laboratories. Areas of his research include differential equations, linear algebra, software for solving elliptic partial differential equations, and computational biology. He and G. Birkhoff have written the monograph Numerical Solutions of Elliptic Problems, SIAM Publications, 1985.

Aditya Mathur

» Professor of Computer Science (1987)
» B.E., Electrical Engineering, BITS, Pilani, India, 1970
» M.S., Electrical Engineering, BITS, Pilani, India, 1972
» Ph.D., Computer Science, BITS, Pilani, India, 1977

Aditya Mathur conducts research in the areas of software testing, reliability, formal approaches for software process control, and the management of smart spaces. (a) Mathur has been a crusader for the use of code coverage criteria in the estimation of software reliability or as an orthogonal metric to assess confidence in the reliability estimates. He has proposed the “Saturation Effect” as a motivating device for quantitative test assessment using an increasingly powerful suite of criteria. This device is often used by vendors to enhance marketing of their test tools. (b) His research group has developed Home Wabash, a tool for the monitoring and control of Smart Spaces and for ensuring the safety of people within such spaces. (c) In collaboration with Raymond DeCarlo, Mathur investigates the use of the theory of automatic control for control of software development processes. (d) Also active now is the long suspended work on the Listen project to explore the use of sound in a variety of monitoring tasks.

SELECTED PUBLICATIONS


Bradley Lucier

» Professor of Mathematics and Computer Science (1981)
» B.Sc. (Hon.), Mathematics, University of Windsor, 1976
» S.M., Applied Mathematics, University of Chicago, 1978
» Ph.D., Applied Mathematics, University of Chicago, 1981

Professor Lucier has worked for over ten years on wavelet and multiresolution methods for image processing and other applications. He has a particular interest in applications in medical imaging (image compression for telemedicine, tomographic and MRI reconstruction, etc.).

The selected publications indicate some of these interests. The first paper relates variational problems to wavelet shrinkage, as introduced by David Donoho and Iain Johnstone. The second paper gives an interpretation of translation-invariant wavelet shrinkage, introduced by Donoho and Ronald Coifman, as gradient descent along a convex functional; Gaussian smoothing can be interpreted in the same way (with a different functional).

Finally, the third paper introduces several results about wavelet methods for medical tomography, especially for Positron Emission Tomography (PET) imaging. Basically, it again puts into a variational framework the wavelet-vaguelette method of Donoho; it shows that wide classes of computationally efficient wavelet transforms can be used for tomography; and it gives examples that show that wavelet techniques are much more effective than the usual filtered back-projection method for PET imaging.

This work has been supported continuously by the Office of Naval Research since 1990.

SELECTED PUBLICATIONS

Jens Palsberg

- Associate Department Head
- Professor of Computer Science (1996)
- Ph.D., Computer Science, University of Aarhus, 1992

Jens Palsberg received a Ph.D. in Computer Science from University of Aarhus, Denmark in 1992. In 1992-1996 he was a visiting scientist at various institutions, including IBM. In 1996 he joined the faculty at Purdue University where he is Associate Head and Professor of Computer Science. His research interests span the areas of programming languages, compilers, software engineering, embedded software, and information security. He has authored over 60 technical papers, and his 1994 book with Michael Schwartzbach is entitled Object-Oriented Type Systems. He is a co-author of the revised version of Appel’s textbook on Modern Compiler Implementation in Java. In 1998 he received a National Science Foundation CAREER award, in 1999 he received a Purdue University Faculty Scholar award, and in 2000 he received a National Science Foundation TR program. Dr. Palsberg’s research has also been supported by DARPA, IBM, and British Telecom. Dr. Palsberg is a former member of the editorial board of IEEE Transactions on Software Engineering, he has served as a program chair for the Static Analysis Symposium, the Symposium on Requirements Engineering for Information Security, and the ACM Workshop on Program Analysis for Software Tools and Engineering, and he has served as a chair of the Compilers and Operating Systems program subcommittee for the International Conference on Compilers, Architectures and Synthesis for Embedded Systems.

SELECTED PUBLICATIONS


Professor Palsberg’s research interests are broadly in design and analysis of algorithms (both theoretical and experimental). He is especially interested in stochastic analysis of dynamic computer phenomena and associated algorithmic problems and in probabilistic analysis of algorithms.

Professor Palsberg has worked recently in the following application areas: Peer-to-Peer (P2P) Computing, Communication Networks, Internet Algorithmics, Web Measurement and Modeling, Computational Biology, and Computational Finance.

Kihong Park

- Associate Professor of Computer Science (1996)
- B.A., School of Management, Seoul National University, 1988
- M.S., Computer Science, University of South Carolina, 1990
- Ph.D., Computer Science, Boston University, 1996

Kihong Park works on Internet and distributed systems, with an emphasis on congestion control, distributed scheduling, and the facilitation of adaptive, fault-tolerant computing on large-scale distributed systems.

Professor Park’s research centers on design and control issues in high-speed multimedia networks including quality of service provisioning architectures, congestion control, distributed scheduling, and the facilitation of adaptive, fault-tolerant computing on large-scale distributed systems. He has over 40 technical publications, and has edited a book “Self-Similar Network Traffic and Performance Evaluation” (co-editor: Dr. Walter Willinger) published by Wiley-Interscience, 2000. His thesis, entitled “Ergodicity and Mixing Rate of One-Dimensional Cellular Automata” (advisor: Dr. Peter Gacs), was on a problem in theoretical probability going back to von Neumann, with applications to fault-tolerance and reliability in large scale systems such as the Internet.

Dr. Park was a Presidential University Fellow at Boston University, is a recipient of the NSF CAREER Award, is a Fellow-at-Large of the Santa Fe Institute, has served on several international program committees, NSF panels, and is a member of ACM and IEEE. He serves on the editorial boards of IEEE Communications Letters and Computer Networks as associate editor.

In 2001, he is organizing an ACM Workshop titled “The Internet as a Large-Scale Complex System” (co-chair: Dr. Walter Willinger), March 29-31, to be held at the Santa Fe Institute, and a SPIE Conference titled “Scalability and Traffic Control in IP Networks” (co-chair: Dr. Sonia Fahmy), August 20-24, at the Colorado Convention Center in Denver.
structured (e.g. XML) data. Prior to joining Purdue, Dr. Prabhakar held a position with Tata Unisys Ltd. from 1990 to 1994.

SELECTED PUBLICATIONS


Vernon Rego directs research in the Parallel Computation and Simulation Laboratory (Pacslab) in Purdue’s computer sciences department. His research interests include software systems for high-performance distributed computation, network protocols, thread systems, parallel stochastic simulation, computational probability and performance, and software engineering. His current projects include the ACES software architecture for multi-threaded distributed computing and parallel simulation, including the EcliPse replicated simulation system (for which he was awarded an IEEE/Gordon Bell Prize), the ParaSol process-oriented distributed simulation system, the Ariadne thread system and the CLAM protocol suite. He was also awarded a German Research Council Award for Computer Networking Research. He has been an invited researcher at the Oak Ridge National Laboratories and an ACM National Lecturer. He is an Editor of the IEEE Transactions on Computers and an advisory board member of The DoD Advanced Distributed Simulation Research Consortium.

Professor Rice is founder of the ACM Transactions on Mathematical Software and is on several other editorial boards. He is the past chair of the Computing Research Association, a fellow of the AAAS, of the ACM, and a member of the National Academy of Engineering. For the past 15 years, Professor Rice has been analyzing numerical methods and problem
solving environments for scientific computing. He has created a general methodology for performance evaluation of mathematical software and developed the ELLPACK system for elliptic problems. It is now being extended to Parallel ELLPACK and PDELab. Professor Rice has published 21 books. Among recent ones are Solving Elliptic Problems with ELLPACK (Springer-Verlag, 1986), Mathematical Aspects of Scientific Software (Springer-Verlag, 1988), Expert Systems for Scientific Computing (North Holland, 1991), Enabling Technologies for Computational Science (Kluwer, 2000). He has also published about 300 scientific articles. The twenty-five or so articles of the past two years were in the areas of agent based computing, computational science, computer security, mathematical software, problem solving environments, recommender systems, simulating gas turbines, and web based computing.

Dr. Sacks’s research area is geometric reasoning in science and engineering. He is a problem solver who couples domain knowledge, mathematics, and computer science to solve real-world problems. He worked on qualitative analysis of nonlinear dynamical systems for his Ph.D. and for the next few years. He has worked on mechanical design since then and plans to continue for a while. He is also working with Matt Mason of Carnegie Mellon University on robot path planning with obstacles and steering constraints and with Victor Milenkovic of University of Miami on robust computational geometry. His unique skill is in combining (often esoteric) mathematics with (often inarticulated) domain knowledge with (often idealized) computational methods to solve real-world problems.

The mechanical design research addresses kinematic analysis and the related tasks of simulation, tolerancing, and parametric design. Kinematic analysis means computing the ways that mechanical parts interact: how gears mesh, how linkages transform motion, how robots grip. Kinematic analysis is central to mechanical design because part contacts largely determine mechanical function and because other forms of analysis (dynamical simulation, stress, tolerance) presuppose it. Prior to his research, a general, practical kinematic analysis algorithm was deemed impossible. He has developed and implemented such an algorithm based on configuration space computation. He is working with academic and industrial collaborators to develop practical mechanical design software based on his research, notably with Ford Motors on transmission design and with Sandia National laboratory on micro-mechanism design. Dr. Sacks is also the Director of the Visualization Center.

SELECTED PUBLICATIONS
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John Steele

- Associate Professor of Computer Science (1993)
- Associate Vice President – Emerging Technologies (1993)

John Steele's research interests are in the areas of computer data communications and computer circuits and systems.

Wojciech Szpankowski

- Professor of Computer Science (1985)
- M.S., Electrical Engineering and Computer Science, Technical University of Gdańsk, 1976
- Ph.D., Electrical Engineering and Computer Science, Technical University of Gdańsk, 1980

Before coming to Purdue, W. Szpankowski was Assistant Professor at the Technical University of Gdańsk, and in 1984 he was Assistant Professor at the McGill University, Montreal. During 1992/1993 he was Professor Invité at INRIA, Rocquencourt, France. His research interests cover analysis of algorithms, data compression, information theory, analytic combinatorics, random structures, networking, stability problems in distributed systems, modeling of computer systems and computer communication networks, queueing theory, and operations research. His recent work is devoted

Yinlong Sun

- Assistant Professor of Computer Science (2004)
- B.S., Physics, Beijing University, China, 1989
- Ph.D., Physics, Simon Fraser University, Canada, 1996
- Ph.D., Computer Science, Simon Fraser University, Canada, 2000

Dr. Yinlong Sun is an assistant professor in the Department of Computer Sciences at Purdue University. His research interests lie in computer graphics, scientific visualization, computer vision, color science, computational nanotechnology, and neuroimaging. He is taking on projects on spectral modeling and rendering, statistical local illumination, graphics standard and quality metrics, spectral vision, physical and chemical visualization, nanoscale simulation and visualization, and neural source imaging. He is particularly interested in combining analytical, numerical, and experimental approaches to solve complex, cross-disciplinary problems. Recently he has initiated the Photometric Graphics and Vision Lab, which involves spectral measurement of lights and objects for graphics and vision applications. Yinlong received his B.S. from Beijing University of China in 1989, and a Ph.D. in Condensed Matter Physics and a Ph.D. in Computer Science from Simon Fraser University of Canada in 1996 and 2000. He is a member of ACM, ACM SIGGRAPH, IEEE, IEEE Computer, and IS&T.

SELECTED PUBLICATIONS

to the probabilistic analysis of algorithms on words, analytic information theory, and designing efficient multimedia data compression schemes based on approximate pattern matching.

He is a recipient of the Humboldt fellowship. He has been guest editors for special issues in IEEE Transactions on Automatic Control, Theoretical Computer Science, Random Structures & Algorithms, and Algorithmica. Currently, he is editing a special issue on “Analysis of Algorithms” in Algorithmica. He serves on the editorial boards of Theoretical Computer Science, Discrete Mathematics and Theoretical Computer Science, and book series Advances in the Theory of Computation and Computational Mathematics.

SELECTED PUBLICATIONS


Professor Vitek is working in foundations and implementation of computer programming languages and has interest in program analysis, real time languages, object-oriented software engineering and information security. He is leading the Open Virtual Machines project to develop a framework for configurable and secure virtual machines for object-oriented languages. This research is being conducted in the Secure Software Systems Lab (S3) Lab founded in early 2000 by Professors Vitek, Hosking, and Paldburg.

Dr. Vitek was born in Czechoslovakia and educated in Switzerland. He earned a MSc in Computer Science from the University of Victoria, Canada, and a Ph.D. from the University of Geneva, Switzerland. He has authored over 30 papers and has edited two books on mobile objects and secure Internet programming. He has served on program committees for international conferences such as PLDI, OOPSLA, ECOOP, POPL, ESOP, ICALP, and SACMAT. Dr. Vitek is a member of CERIAS, Research Areas: Programming Languages, Security, Compilers

Research Lab: Secure Software Systems Lab

SELECTED PUBLICATIONS


In his research, Professor Jeff Vitter investigates how to manage and process very large amounts of data. He has helped popularize the field of external memory algorithms, where the goal is to develop I/O-efficient algorithms that alleviate the bottleneck between fast internal memory and slow external storage. His work melds theory and practice to span a number of application areas, including geographic information systems (GIS), databases, computational geometry, data mining, and text indexing. For example, Professor Vitter and colleagues designed an I/O-efficient algorithm to help researchers in the Nicholas School of Environment at Duke compute how water flows and accumulates, based on satellite elevation data. The computation time for processing data from the Appalachian Mountain region was reduced from several days to just a few hours.

Honors & Awards: Fellow, John Simon Guggenheim Foundation, 1986; Fellow, Institute of Electrical and Electronics Engineers (IEEE), 1993; Fellow, Association for Computing Machinery (ACM), 1996; National Science Foundation Presidential Young Investigator Award 1985; Fulbright Scholar, 1998; Recognition of Service Award, ACM, 1998 and 2001.

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Research Lab: Secure Software Systems Lab

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analysis of algorithms, especially number theoretic algorithms. He and J. W. Smith of the University of Georgia have built a special processor with parallel capability for factoring large integers. He is the author of Factorizations of bn ± 1, b = 2, 3, 5, 6, 7, 10, 11, 12 up to high powers, Contemporary Mathematics series, v. 22, Third edition, American Mathematical Society, 2002 (with John Brillhart, D. H. Lehmer, J. L. Selfridge and Bryant Tuckerman) (See http://www.ams.org/online_bks/conm22) and Cryptanalysis of Number Theoretic Ciphers, CRC Press, 2002.

SELECTED PUBLICATIONS

Dongyan Xu
» Assistant Professor of Computer Science (2001)
» B.S. Computer Science, Zhongshan University, China, 1994
» Ph.D. Computer Science, University of Illinois at Urbana-Champaign, 2001

Professor Xu’s research focuses on service provisioning in next generation distributed systems (such as overlay/peer-to-peer networks, utility/autonomic computing systems). He has conducted research in multimedia computing and networking, mobile computing and networking, and distributed OS and middleware, all with a focus on Quality of Service (QoS) provisioning issues. He is the Year 2000 recipient of the C.L. and Jane W-S. Liu Award in the Department of Computer Science at UIUC. He is a member of ACM, IEEE, IEEE Communications Society and e-Enterprise Center at Discovery Park.

SELECTED PUBLICATIONS

David Yau
» Assistant Professor of Computer Science (1997)
» B.S., Computer Sciences, Chinese University of Hong Kong, Hong Kong, 1989
» M.S., Computer Sciences, University of Texas at Austin, 1992
» Ph.D., Computer Sciences, University of Texas at Austin, 1997

David Yau was born in Hong Kong. After getting his Bachelor's degree in computer science from the Chinese University, he spent one year with the Systems and Technology group of Citibank, NA, as assistant manager. He then entered graduate school at the University of Texas at Austin. During that time, he worked on a video server project at IBM, and completed his Ph.D. as a member of the Networking Research Lab. David is interested in network and operating system architectures and algorithms for quality of service (QoS) provisioning. He is also interested in multimedia communication and software-programmable router technologies. He and his students prototype OS and router services on experimental network platforms, and measure their performance impact on benchmark applications. He was the recipient of an IBM graduate fellowship at Texas. In 1999 he received an NSF Career award for OS and network research on QoS.

David is a member of ACM and IEEE. He has served on the program committees of many IEEE and ACM conferences in networking, multimedia, and real-time systems.

SELECTED PUBLICATIONS
Apostolico, Alberto


Walid Aref


Walid Aref » Research and Development of Database Technologies for Modern Applications (Career Award). National Science Foundation. 9/15/2000-9/30/2006, $150,000.


Bhargava, Bharat


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Atallah, Mikhail J.


Bhargava, Bharat


Bharat Bhargava » CERIAS/Lilly Endowment. CERIAS. 8/1/2002-7/31/2002, $65,000.

Fahmy, Sonia


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Grama, Ananth Y.

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Ananth Y. Grama » Dominant and Deviant Pattern Detection in Event Traces for Intrusion Detection Analyzing Event Sequences for Dominant and Deviants. CERIAS.

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8/1/2000-12/31/2005, $3,000.


Christoph M. Hoffmann, Ahmed Sameh, Ananth Y. Grama, Voicu Popescu, J. Bottom, David Ebert, and J. Paul » MRI: Acquisition of Equipment for Purdue Envision Center for Data Perceptionalization. National Science Foundation.


**Hambusch, Susanne E.**


**Hoffmann, Christoph M.**


**Hosking, Tony**


Palsberg, Jens


Park, Kihong


Prabhakar, Sunil K.


Rego, Vernon


Rice, John R.


Popescu, Voicu

Sacks, Elisha P.


Sameh, Ahmed


Spafford, Eugene


Eugene Spafford » Forensic Evidence Capture and Analysis. MITRE Corp. 1/2/2001-12/31/2003, $15,000.


Eugene Spafford » A Summer Workshop for Beginning Infosec Educators. National Science Foundation. 1/1/2002-12/31/2003, $158,207.

Szpankowski, Wojciech


Vitek, Jan


Wagstaff, Samuel S.


Yau, David


