

INTER CONNECTIONS

A Report on Interdisciplinary Computing at the
University of Maryland Institute for Advanced Computer Studies

Summer 2000

Keck Laboratory for the Analysis of Visual Movement Established

Imagine a suite of cameras collecting synchronized videos of a patient undergoing physical rehabilitation after a serious accident. The process allows a therapist to view a three-dimensional, dynamic computerized reconstruction of the patient's movements and compare them to movements of other patients at similar stages of therapy (or to the same patient at previous therapy sessions). The same technology records and analyzes a skilled technician assembling a product and lets teachers and students see these actions from almost any viewpoint they choose, even ones different from any of the cameras.

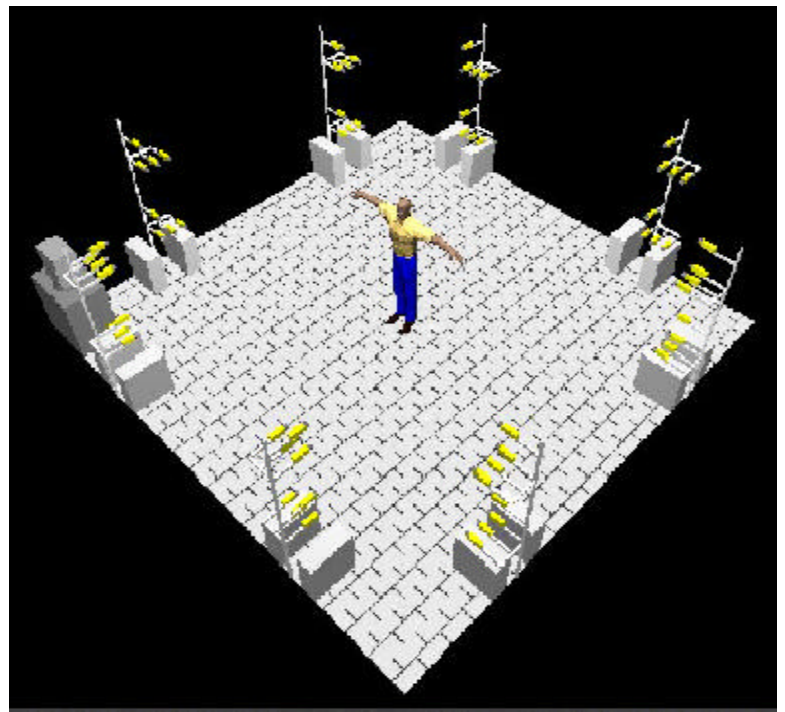
The Keck Laboratory for the Analysis of Visual Movement was established in 1999 with a generous gift from the W.M. Keck Foundation, and matching support from the University of Maryland to support basic research in computer vision that will make such applications feasible. The laboratory is being used to study problems related to human movement and action.

It is a multi-perspective imaging laboratory, containing sixty-four digital, progressive scan cameras organized as sixteen short baseline stereo rigs. In each quadrangular rig, there are three monochromatic and one color camera. The cameras are connected to a network of sixteen PCs (dual processor PCs running Windows NT) that can collect imagery from all of the cameras at speeds of up to 85 frames per second.

In addition to their use in video data collection, the networked PCs also form a state of the art parallel

processing system with 32 Intel Pentium II processors, 16 GB of RAM and 160 GB of fast disk space. Research on parallel real time computational vision algorithms is also being conducted at the Keck lab.

The head of the laboratory is Prof. Larry Davis (UMIACS and Computer Science) and the affiliated



Sixty-four digital video cameras provide synchronized video.

faculty include Professors Yiannis Aloimonos (CS and UMIACS), Rama Chellappa (ECE and UMIACS), and Aziel Rosenfeld (CfAR/UMIACS). The laboratory was primarily designed by Ross Cutler, a Faculty Research Assistant working under Prof. Davis.

Several research groups are already using the laboratory for different computer vision projects. For more information, see <http://www.umiacs.umd.edu/users/lsd/kecklab.html>.

William Myron Keck was an oilman who made his money in the first half of the twentieth century. His foundation is among the ten largest in the U.S. supporting research. Keck foundation grants support acquisition of equipment and facilities by non-profit organizations (see <http://www.wmkeck.org> for information).



Welcome to UMIACS' inaugural issue of INTERCONNECTIONS

Since its inception almost 15 years ago, UMIACS has played a major role at the University of Maryland in building strong interdisciplinary research programs in computing. During this time, we have been fortunate to attract distinguished researchers to the Institute, many of whom hold joint appointments in outstanding academic units such as Computer Science, Electrical and Computer Engineering, Linguistics, Geography, Philosophy, Business, Education, and Library and Information Services. Since computing is at the core of all our research activities,



UMIACS has a very unique relationship with the Department of Computer Science whose graduate program is 11th in the latest *US News & World Report* rankings of the

computer science graduate programs in the nation. The synergistic environment provided by UMIACS enables innovative collaborations between the Computer Science faculty and other faculty on campus.

Recently, the Institute has experienced a substantial growth in its research programs. Last year's research expenditures exceeded \$15M, almost 80% of which came from external sources. This growth is due to the development of:

◆ **Research programs addressing fundamental issues at the interface between computer science and other disciplines.** Major programs include: (1) computer vision with a recent focus on the computational modeling of humans in action; (2) parallel and distributed computing with a particular emphasis on Earth Science applications; (3) natural language processing and computational linguistics; (4) multimedia and interactive systems focusing on information visualization, multimedia databases, and educational

technologies; (5) software engineering concentrating on the software process; and (6) design and management of heterogeneous networks and real-time systems. Included in this issue of **INTERCONNECTIONS** are progress reports on two of our projects. The first, led by Prof. V.S. Subrahmanian, revolves around foundational work for deploying and managing collaborating intelligent agents in a distributed, heterogeneous environment. The second, led by Prof. J. Townshend and me, describes some of the research themes underlying our NASA-funded Land Cover Earth Science Information Partnership (ESIP). Also, included in this issue, are summaries of three new exciting projects – multi-lingual and multimedia information retrieval funded by DARPA, digital libraries for children funded by NSF, and distributed collaboration and mediation funded by NSF.

◆ **An advanced computing infrastructure.** This infrastructure currently supports a number of state-of-the-art laboratories including the Laboratory for Parallel and Distributed Computation (LPDC), the Keck Laboratory for the Analysis of Visual Movement, the Human-Computer Interaction Laboratory (HCIL), the Language and Media Lab (LAMP), and the Computational Linguistics and Information Processing (CLIP) Laboratory. UMIACS has deployed an ATM infrastructure supporting high-speed connections to our laboratories. In particular, we routinely achieve 50Mbps on average to NASA Goddard for data transfers related to our ESIP project. We are also scheduling significant improvements to incorporate gigabit Ethernet and OC-12 connectivity into our infrastructure. The Keck Laboratory led by Prof. Larry Davis is featured in this issue.

◆ **Long-term partnerships with national and international research centers.** Some of our current major partners include the National Partnership for Advanced Computa-

tional Infrastructure (NPACI) led by the San Diego Supercomputer Center – one of the two NSF funded national supercomputer centers, the Laboratory for Telecommunications Sciences – a new major collaborative center between DoD, industry, and academia focusing on advanced research in networking and telecommunications, and the Fraunhofer Gesellschaft – a joint government-corporate sponsored applied research and technology transfer organization in Germany. Some of these partnerships will be discussed in future issues of **INTERCONNECTIONS**.

Many new exciting research activities and initiatives are currently underway. In particular, I am delighted to report that the campus has just approved the establishment of the *Center for Bioinformatics and Computational Biology* to be housed in UMIACS, which will initially focus on computational genomics. We will be actively recruiting new faculty in biological sciences, computer science, and mathematics to lead the Center. Another exciting new development is the establishment of the *Center for Scientific Computing and Mathematical Modeling* in which UMIACS will be a major participant. We will discuss some of these new activities in the next issue of **INTERCONNECTIONS**.

UMIACS is a truly vibrant place that promotes excellence in interdisciplinary research and education in computing across the College Park campus. It has been my privilege to serve as the Director during the past five and a half years, and I am eager to continue to work with the faculty, staff, and our partners to achieve even higher prominence of our research programs.

Please feel free to contact me about any issue regarding UMIACS at joseph@umiacs.umd.edu.

Joseph JaJa

Ben Bederson Interviewed on Java Site

Ben Bederson (Computer Science and UMIACS) was interviewed by Sun Microsystems for its series *Face to Face – visits with Java™ Technology Heroes*. The interview begins with a discussion on how computers are designed to be used by one person at a time although people often work best together if they are in close proximity to each other and interacting through a common interface. “There might be two people debugging, or two people writing something, or one person showing someone else how to use something, or several people being creative together, brainstorming, searching. That’s how people work together. And computers don’t support that type of collaboration with more than one user.”

To solve this problem and to address the limitations of the now dominant WIMP (windows/icons/menus/pointers) interface design style, Bederson develops a novel approach based on zoomable interfaces and tools to support multiple input devices instead of a single mouse. And, he uses Java 2 technology to do it. Bederson and his team have developed *Jazz*, a toolkit for creating graphical applications with features such as zooming and multiple representations; *MID*, a toolkit that supports multiple input devices; and *KidPad*, a storytelling tool for children that builds on Jazz and MID.

The Sun Microsystems interview may be found at <http://java.sun.com/features/1999/09/bederson.html>.

Allison Druin on High-Tech Toys

A recent article in USA Today (Feb. 7, 2000) discusses how toys are going high-tech. While earlier tech toys tended to be more technology than toys and often inhibited a child’s imagination, today the emphasis is on developing tech toys that are interactive and can be manipulated by the child in a way that fosters development. These toys utilize artificial intelligence, camera technology, robotics, etc. and are often plugged into a computer and the Internet.

Allison Druin (College of Education and UMIACS) is one of the researchers in the field interviewed for the article. “If they [the kids] can dream it, mostly we can come up with it,” she says. What they are trying to come up with in the Human-Computer Interaction Lab goes beyond computerized toys. The goal is to create a “full-room environment.”

For more information, contact Allison Druin at druin@umiacs.umd.edu.

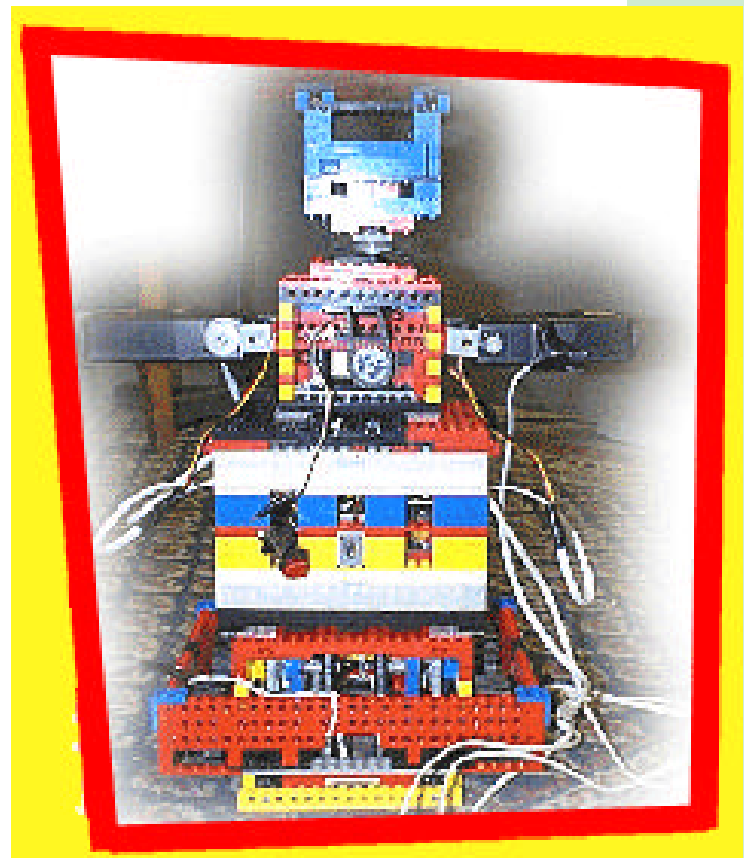
Jim Hendler Predicts the Future

On CNN.com’s new millenium page, Jim Hendler (Computer Science and UMIACS) is one of 14 experts exploring what the future will hold in their areas of expertise ranging from food to space.

Hendler predicts that the trends in artificial intelligence in the near future will be related to the Internet. “I think the biggest change in artificial intelligence will be scaling it to the Internet and solving some of the big problems the net has” resulting in “much smarter Web searches, much better Web agents.”

In the area of robotics, Hendler foresees the robot moving out of the lab and into our homes. “Your microwave will be smarter, your dishwasher will do a much better job, maybe even help to load, but certainly to position things and do a better job of washing.”

For Hendler’s appraisal of whether robots will have awareness and whether artificial intelligence will change our perception of the world, go to <http://www.cnn.com/SPECIALS/1999/future/flash.html>.



Development of a “robotic skeleton” in the HCIL Lab.

Negotiation and Cooperation in Multi-Agent Environments

One of the challenges in computer science today is to build the software infrastructure for negotiation and cooperation over the Internet. Prof. Sarit Kraus (UMIACS and Bar-Ilan University) has recently received two National Science Foundation awards to consider several aspects of this challenge.

The first award, entitled “Reaching Agreements More Effectively: Strategies and Learning Techniques” is a joint project with Prof. Jon Wilkenfeld (Dept. of Government and Politics and UMIACS). The objective of the project is to identify strategies and learning techniques for the development of automated agents that will be able to participate

successfully in auctions and negotiations.

The main application domain of the project is the buying and selling of items in electronic commerce, a medium which is becoming extensively widespread. The domain of document allocation in distributed information servers such as NASA’s Earth Observing System’s Data and Information System is also considered.

The second award, entitled “Decision-making in the Context of Commitments to Team Activity,” is a joint project with Prof. Barbara Grosz of Harvard University. It aims to provide the scientific and technological base for constructing collaboration-capable software agents, i.e.

systems able to participate effectively in multi-agent collaborations with people and other software agents.

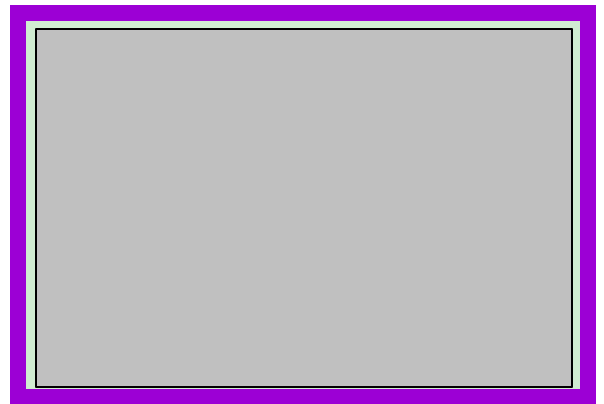
The research comprises three activities: an empirical investigation of different policies governing commitment to group activities and their influence on individual and group behavior and outcomes; development of a formal theory that may be used to abstractly address questions of intention reconciliation and to identify stable strategies and effective policies; and construction of collaboration-capable software agents.

Related papers are available at www.umiacs.umd.edu/users/sarit.

It’s not the English-Wide Web Anymore

Ever wonder why we call it the “World-Wide” Web if so many of us can only use the parts that are in English? Professors Doug Oard, Bonnie Dorr and Philip Resnik recently received a new \$1.9 Million DARPA grant for research on technology to search collections that contain foreign languages. The new project builds on the group’s recent work using Lexical Conceptual Structures for query and document translation. The new project adds an additional focus on reducing the complexity of adapting existing systems to search documents written in a new language. Other researchers involved in the project include Dr. Tapas Kanungo (document image processing) and Dr. Gina Levow (speech retrieval) in collaboration with the Johns Hopkins University Center for Language and Speech Processing.

This work will be conducted through the UMIACS Computational Linguistics and Information Processing Lab (CLIP) that has major projects in machine translation, information retrieval, federated databases, and foreign language tutoring. For more information visit <http://www.umiacs.umd.edu/research/CLIP/>.



Children's Digital Libraries



Allison Druin, Assistant Professor in UMIACS and the College of Education, recently received a National Science Foundation award for the creation of new technologies for children's digital libraries. Over the next three years, Druin will

collaborate with Professors Ben Bederson (Computer Science/UMIACS), Ben Shneiderman (Computer Science/UMIACS), and John Guthrey (College of Education) in developing a digital library with multimedia materials from the Discovery Channel and the Patuxent Wildlife Research Center.

When asked why digital library research is important for children, Druin explains "The majority of today's digital libraries were not created for young children." To access these libraries, children commonly need to negotiate complex boolean text keyword searches. Few libraries offer visual browsing in addition to querying, so that young children can explore freely as a part of their learning experience. In addition, children differ from adults in the way they choose to organize and present their research information once it has been found. "One critical

difference is in the way young children enjoy collaboration in their learning environment," Druin says.

To address these challenges, Druin will lead an interdisciplinary team of researchers at the University of Maryland that will partner with elementary school children and teachers.

Throughout this research, Druin expects diverse points of view and a wide range of experiences to be important ingredients in bringing together children and adults in



intergenerational, interdisciplinary research teams. Children and teachers will be an integral part of the design process as full partners and stakeholders in research. Not only will the team examine

how children can have an impact on the design and development of new digital libraries, but the team will also look to understand how these new technologies can have an impact on children as learners. To learn more go to <http://www.cs.umd.edu/projects/hcil/>.



A prototype sketch for the Digital Library interface for children, v.01. Children can use this interactive sketch to browse and search for digital data (movies, images, audio and text) about animals.

There are three main areas: In the zoo at the top left, children can find the animals they are interested in. At the bottom left, they can use the globe to find animals that live in a particular part of the world. At the top right, they can make customized searches by giving visual search parameters to their "search friends" Kyle and Dana.

IMPACT: Interactive Maryland Platform for Agents Collaborating Together

The principal goal of the IMPACT project, led by Prof. V.S. Subrahmanian (Computer Science and UMIACS), is to develop the foundation for building the software infrastructure that will facilitate the creation, deployment, interaction, and collaboration of software agents in a heterogeneous, distributed environment. The project will provide techniques and tools to

- ◆ Build agents on top of existing legacy code
- ◆ Enable agent interoperability
- ◆ Organize many services offered by a large number of networked agents
- ◆ Facilitate collaborations between the agents

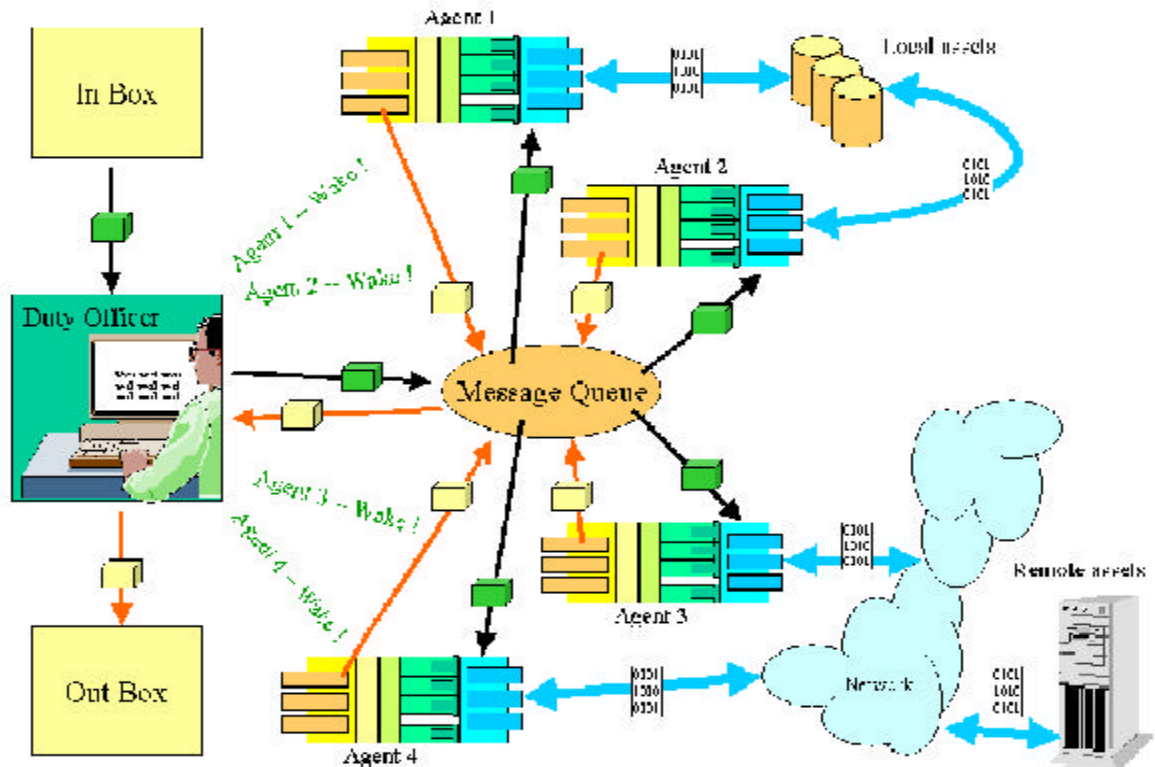
The current IMPACT prototype includes several components. First, we have an IMPACT Server that provides lookup services based on name or attributes, and also includes approximate matching and type services. Humans and other agents can describe services needed. Second is the agent itself. An agent consists of a set of data types, a set of API functions, a set of actions, action and integrity constraints, and an agent program. Third is the Agent Development Environment, used to develop and test agents before deployment. Fourth are Agent Roost(s), where deployed agents execute. The Agent Roost supports waking, messaging,

replication and mobility of agents. Lastly, is the Agent Log, which is useful for tracking messages between agents, and debugging.

IMPACT agents have many advantages. They are based on a rich mathematical foundation. The agents themselves are intelligent (reasoning about time and uncertainty), can collaborate with other agents, and are autonomous, reactive and mobile. Legacy data/code and specialized data can be “agentized” in this system; there is no need to start from scratch. IMPACT is open, that is, it can interact with other agent platforms. It is dynamic; arbitrary actions can be created and coupled to changes in an agent’s environment. Also, IMPACT agents can be rapidly created and deployed with the IMPACT agent development environment

In the future, we plan to implement “smart agents,” based on theoretical results with temporal, spatial and planning agents. These include probabilistic agents (reasoning with uncertainty), and meta-agent programs (agents reasoning about other agents). We will optimize some of the internal algorithms, extend the existing agent library, add security features, and create more applications to demonstrate the feasibility and capability of the IMPACT system. For more details, see <http://www.cs.umd.edu/projects/impact/>.

IMPACT Agent Roost -- Internal work and data activity...



Bobby Bhattacharjee

Bobby Bhattacharjee is a new faculty member holding a joint appointment in the Department of Computer Science and UMIACS. He received his Ph.D. in Computer Science from Georgia Tech in 1999.

At Georgia Tech, Bobby designed and co-implemented the Odyssey Active Network including the CANEs active networking environment and the Bowman Node Operating System. This work helped develop an architecture for active networks; this architecture supports multiple simultaneous user-network interfaces and is being standardized by the DARPA community.

As a pre-cursor to the DARPA active networking architecture, he designed and implemented the Control-on-Demand active networking platform at AT&T Labs. He also worked on Internet Topology



Modeling (GT-ITM) and Application-Layer Anycasting projects.

Bobby's research interests are Wide-area Networking, Network Protocol Design, Distributed Systems and Algorithms, and Operating Systems. He is currently working on the project

“Support for service differentiation in the Internet Active Networking: Architectures and Applications.”

Bobby's research vision is to develop the underpinnings for building a “utopian” network infrastructure - one that is highly scalable, yet highly configurable and secure. Along with his work in scalability and configurability, he also works on issues in network security. “Eventually,” Bobby says, “my hope is to build systems that produce mechanisms and techniques that *can* be incorporated back into the very non-utopian real world.”

His hobbies are watching old movies and all manners of sports and hiking. Bobby can be reached at bobby@cs.umd.edu, 4147 AVW and 301-405-1658.

Doug Szajda

Doug Szajda received a B.S. in mathematics from Lafayette College in Easton, Pennsylvania in May of 1984. Following two years of high school teaching (physics, computer science, math), he enrolled at the University of Virginia, where he received a M.S. (1988) and a Ph.D. (1992) degree in mathematics. In July of 1992, Doug accepted an assistant professorship in the Mathematics Department at Washington and Lee University in Lexington, Virginia. He remained there until June of 1997, at which time he returned to graduate school in the Department of Computer Science at the University of Virginia.

At UMIACS, Doug is working primarily with Ashok Agrawala on real-time systems, networks, and complex system integration.

Doug can be reached at szajda@umiacs.umd.edu and 301-405-1753.



Glenda Revelle

Glenda Revelle is a new research scientist in the HCI laboratory at UMIACS. She comes to UMD from 16 years at

Children's Television Workshop, where she oversaw research and product development in Interactive Technologies. Glenda did her Ph.D. work in Developmental Psychology at the University of Michigan. Glenda notes that Gary Olson, who nowadays is known for his HCI work, was her dissertation advisor at Michigan. At that time (in the early 80's), however, they were both doing infant cognition work! Glenda's research at Michigan focused on language and cognition in infants and preschoolers, and her dissertation examined preverbal infants' conceptual understanding of language-relevant object categories.

Glenda joins the UMIACS research program as a half-time Research Scientist. Initially she'll be working with Allison Druin on her NSF-funded Digital Libraries project as well as working with other faculty in the HCIL to expand the laboratory's teaching and research programs.

On the personal side, Glenda reports that her life is dominated, enriched and energized by her “fabulous 6-year-old,” Andrew, and that she is a huge fan of folk/blues/rock/roots music. She can be reached at glenda@umiacs.umd.edu.



Antonios Deligiannakis Junrui (Hench) Qian

Antonios Deligiannakis, (also known as Antonis, Tony or Anthony), is a graduate student in Computer Science and a first year UMIACS Fellow. Tony graduated from the National Technical University of Athens (NTUA) and received a B.S. in Electrical Engineering and Computer Science.

A special interest of Tony's is the field of databases. His research interests include Data Warehouses, OLAP (On Line Analytical Processing) and distributed databases. His diploma thesis in NTUA involved designing and implementing the storage manager for a database system developed there.

Tony may be reached at adeli@cs.umd.edu.



Junrui Hench Qian (known as Hench), a 2nd year UMIACS Fellow, was born in Shanghai, China in 1981.

Hench is quite unusual in that he entered Mississippi State University in 1995 at the age of 13 after finishing grades 5-12 in a span of 4 years. He completed both a B.S. in computer science and a B.S. in mathematics in three years. As a senior in college, he was named the most outstanding senior in both computer science and mathematics.

To UMIACS' delight, Hench decided, at the age of 16, to continue his graduate education in computer science at the University of Maryland. His current interests are in the visual aspects of computing, including computer vision and user interfaces.

Hench can be contacted at qian@cs.umd.edu.



Bill Shapiro

William (Bill) Shapiro is a second-year graduate student in the Computer Science Department and a second year Minker Fellow. Bill received a B.A. in Economics and a B.S. in Computer Science from Washington University in St. Louis. As an undergraduate, he worked as a research assistant in the Distributed Programming Environments Group where he focused on simplifying the construction of distributed applications.

At Maryland, Bill's primary research interests are databases and computer networks. Last year he worked with Mike Franklin and presented a demonstration of a toolkit for disseminating at the SIGMOD database conference in June 1999. Last summer Bill was an intern at a startup company called InterTrust in Silicon Valley.

Bill's contact information is billshap@cs.umd.edu, AVW 3228, telephone 405-2717.

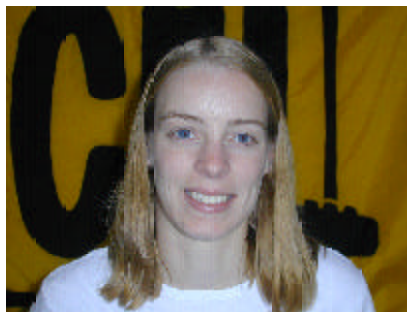


Hilary Browne

Hilary Browne is a new Ph.D. student in Computer Science and a first year recipient of a Minker fellowship. She received a B.A. in Computer Science and Mathematics in 1997 from Williams College. Prior to coming to Maryland, Hilary was a member of the technical staff at GTE Laboratories.

The main reason Hilary chose Maryland over other schools was the Human Computer Interaction Laboratory, HCIL, one of the premier HCI labs in the nation.

In her spare time Hilary runs, hikes, sails and plays lacrosse. She can be contacted at hbrowne@cs.umd.edu.



Stephen Halperin, CMPS Dean



Dr. Stephen Halperin is the new Dean of the College of Computer, Mathematical and Physical Sciences at the

University of Maryland, College Park. He oversees the activities of over 500 faculty, 2,500 undergraduates and 750 graduate students in six academic departments, three multi-disciplinary centers, and three research-based institutes, including UMIACS.

Larry Davis, Chair of Computer Science



Professor Larry Davis has agreed to take on the position of Chair of the Department of Computer Science for a five-

year term beginning July 1, 2000. He sees as his greatest challenge growing the Department back to the level of 45-50 faculty while maintaining the very high standards for faculty hiring

that has made computer science at Maryland the 11th ranked program in the nation. The Department just completed its most aggressive recruiting season in history, bringing over 20 faculty candidates to the campus during March and April. "We're hoping to attract 4-6 of these candidates to the campus," Prof. Davis says, "and offering these candidates joint appointments with UMIACS will hopefully give us a competitive edge."

Faculty News

Victor Basili

- ☺ 2000 SIGSOFT Outstanding Research Award
- ☺ Keynote speaker: International Conference on Software Engineering & Knowledge Engineering, SEKE'99, Germany, June 1999.

Larry Davis

- ☺ Invited talk: 3rd International Conference on Distributed Video, Kyoto, Japan, November 1999.

Bonnie Dorr

- ☺ Book chapter: Dorr, Bonnie J., Pamela W. Jordan, and John W. Benoit, "A Survey of Current Research in Machine Translation," *Advances in Computers*, Vol 49, M. Zelkowitz (Ed), Academic Press, London, 1999.
- ☺ Book chapter: Dorr, Bonnie J. and Douglas Jones, "Acquisition of Semantic Lexicons: Using Word Sense Disambiguation to Improve Precision," in Evelyn Viegas (Ed), *Breadth and Depth of Semantic Lexicons*, Kluwer Academic Publishers, Norwell, MA, 1999.

Samir Khuller

- ☺ Editor: *Journal of Graph Algorithms and Applications*.
- ☺ Associate Editor: *Networks*.
- ☺ Program Committee Chair: 2000 workshop on Approximation Algorithms to be held in Germany in Sep. 2000.

Top 10 Algorithms of the Century

Professors J. JaJa (UMIACS and ECE) and G.W. Stewart (UMIACS and CS) were among the few researchers invited to contribute an article to the special issue (January/February 2000) of the *IEEE Computing in Science and Engineering* covering the top 10 most influential algorithms of the century. JaJa's article gave a perspective on the quicksort algorithm while Stewart's article outlined the decompositional approach to matrix computation. Other algorithms covered include the simplex method, the QR algorithms, FFT, the Metropolis algorithm, the Fortran I compiler, Krylov subspace iteration, the fast multipole algorithm, and the integer relation detection.

Jack Minker

- ☺ Founding editor-in-chief: *Theory and Practice of Logic Programming*.
- ☺ Invited lecture: Brooklyn College, October 1999.
- ☺ Invited talk: Washington College, Maryland, October 1999.

Dave Mount

- ☺ Invited talk: International Workshop on Similarity Search (IWOSS'99) in Florence, Italy, September 1999.

Dianne O'Leary

- ☺ Book: George Cybenko, Dianne P. O'Leary, and Jorma Rissanen, eds., *Mathematics of Information Coding, Extraction and Distribution*, IMA Volumes in Math. and Its Applics., Springer-Verlag, New York, 1999.
- ☺ Organizer: Householder XIV Meeting on Numerical Algebra, Whistler, British Columbia, June 1999 and Olga Taussky Todd Celebration of Careers for Women in Mathematics, University of California, Berkeley, July 1999.

Louiqa Raschid

- ☺ Keynote speaker: First (Russian) National Conference on Digital

Libraries, St. Petersburg, Russia, October 1999.

Jim Reggia

- ☺ Book: J. Reggia, E. Ruppin, D. Glanzman (eds.) *Disorders of Brain, Behavior and Cognition: The Neurocomputational Perspective*, Elsevier, 1999.

Philip Resnik

- ☺ Editorial Board Member: *Computational Linguistics; Cognition; and Computers and the Humanities*.
- ☺ Executive Board Member: North American Association for Computational Linguistics (NAACL).

Azriel Rosenfeld

- ☺ Book: B. Perry, S.D. Chang, J. Dinsmore, D. Doermann, A. Rosenfeld, and S. Stevens, "Content-Based Access to Multimedia Information - From Technology Trends to State of the Art," Kluwer, Boston, 1999.

Marv Zelkowitz

- ☺ 2000 SIGSOFT Outstanding Research Award
- ☺ Editor: *Advances in Computers*, Volumes 48 and 49, 1999, Academic Press, London.

Workshop on Logic-Based Artificial Intelligence

The Workshop on Logic-Based Artificial Intelligence (LBAI), sponsored by the National Science Foundation and the American Association for Artificial Intelligence, was held in Washington, D.C., June 13-15, 1999. The workshop was organized by Jack Minker and John McCarthy.

The purpose of the workshop was to bring together researchers who use logic as a fundamental tool in AI so as to permit them to review accomplishments, assess future directions, and share their research in LBAI.

A brief report on the Workshop appeared in AI Magazine (J. Minker, "The Workshop on Logic-Based Artificial Intelligence," AI Magazine, 20/4 Winter 1999, 97—102). A book that consists of papers from the Workshop is being edited by Jack Minker.

Workshop on Modeling of Heterogeneous Networks

The Workshop on Modeling of Heterogeneous Networks, sponsored by UMIACS and the Laboratory for Telecommunications Sciences, was held at the University of Maryland Inn & Conference Center on October 25, 1999. Over 100 researchers attended the workshop. The invited speakers were M. Satyanarayanan, William Sanders, David Nicol, Richard Fujimoto, Donald Towsley, and Kishor Trivedi.

For more information, contact Joseph JaJa, joseph@umiacs.umd.edu

Theory Day

The 18th Maryland Theoretical Computer Science Day, organized by UMIACS, was held March 31, 2000. Over the years, Theory Day has provided an opportunity for practitioners and students in the field to discuss their research and network with colleagues. The speakers this year were: Vijay Vazirani, Georgia Tech; Lenny Pitt, University of Illinois; and Herbert Edelsbrunner, Duke University.



Samir Khuller, CS and UMIACS and Herbert Edelsbrunner, Duke University, during the Theory Day luncheon.

ACL '99

The University of Maryland hosted the very successful 1999 meeting of the Association for Computational Linguistics (ACL), the premier international conference in the field of natural language processing, in June at the Inn and Conference Center.

Over 500 computational linguists from industry, academia, and government attended ACL. Workshops, demonstrations, tutorials and more than 80 paper presentations were featured.

Bonnie Dorr (CS and UMIACS) serves on the ACL Executive board and was the local arrangements chair for the conference. Many UMIACS researchers participated in the conference including Mari Broman Olsen, Philip Resnik, Doug Oard, David Traum, and Amy Weinberg.

Photos of the event are now available at <http://www.umiacs.umd.edu/research/CLIP/acl99pictures/>.



Gina Levow, Priscilla Rasmussen, and Bonnie Dorr at the ACL '99 registration desk.

5th Annual Research Review Day



The Fifth Annual Electrical Engineering, Computing and Systems Research Review Day was held Friday, May 12, 2000 and was attended by participants from local industry and government research labs. The event was a collaborative effort by the Department of Electrical and Computer Engineering, the Department of Computer Science, the Institute for Systems Research, and UMIACS to highlight some of the current research activities conducted in the four units.

For a sample of the projects presented, visit <http://www.ece.umd.edu/RRD/>.

Awards

Over \$6 million in Awards July 1999 – April 2000

V. Basili, M. Zelkowitz	Collaborative Research - Brazil – NSF
B. Bederson	Context Based Temporal Reasoning – ARL
R. Chellappa	Model Based Recognition of Targets – ARL
L. Davis	Crew Performance Analysis – Foster Miller
L. Davis	High Performance Systems for Shape Modeling – NSF
L. Davis, R. Chellappa	Real Time Computer Surveillance –NIJ
L. Davis, V. Subrahmanian	Real Time Distributed Algorithms – AF
L. Davis, Y. Yacoob	Gesture Driven Control – ONR
D. Doermann, D. Dementhon	Task Specific Evaluation of Technology for Digital Libraries – LUCITE
D. Doermann, A. Weinberg, B. Dorr	Language and Media Processing Lab – DoD
B. Dorr, J. Hendler, D. Oard	Scalable Translingual Document Detection – ONR
A. Druin	Digital Libraries for Children – NSF
C. Fermueller	Enhanced Vision – NSF
J. JaJa	Modeling and Performance of Heterogeneous Networks – LTS/DoD
J.JaJa, L. Davis	Collaborative Education & Reseach Initiative (with Bowie State) – NSF
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J. Saltz, J. JaJa	National Partnership for Advanced Computational Infrastructure (NPACI) – NSF
H. Samet	Collaborative Research - Brazil – NSF
H. Samet	Real Time Urban Management System – NSF
B. Shneiderman, C. Plaisant K. Norman	Human Computer Interface Design – Census
B. Shneiderman, C. Plaisant	Citizen Access to Government Statistical Data – UNC
V. Subrahmanian, D.Nau	Scalable Intelligent Agent Architecture – ARL
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