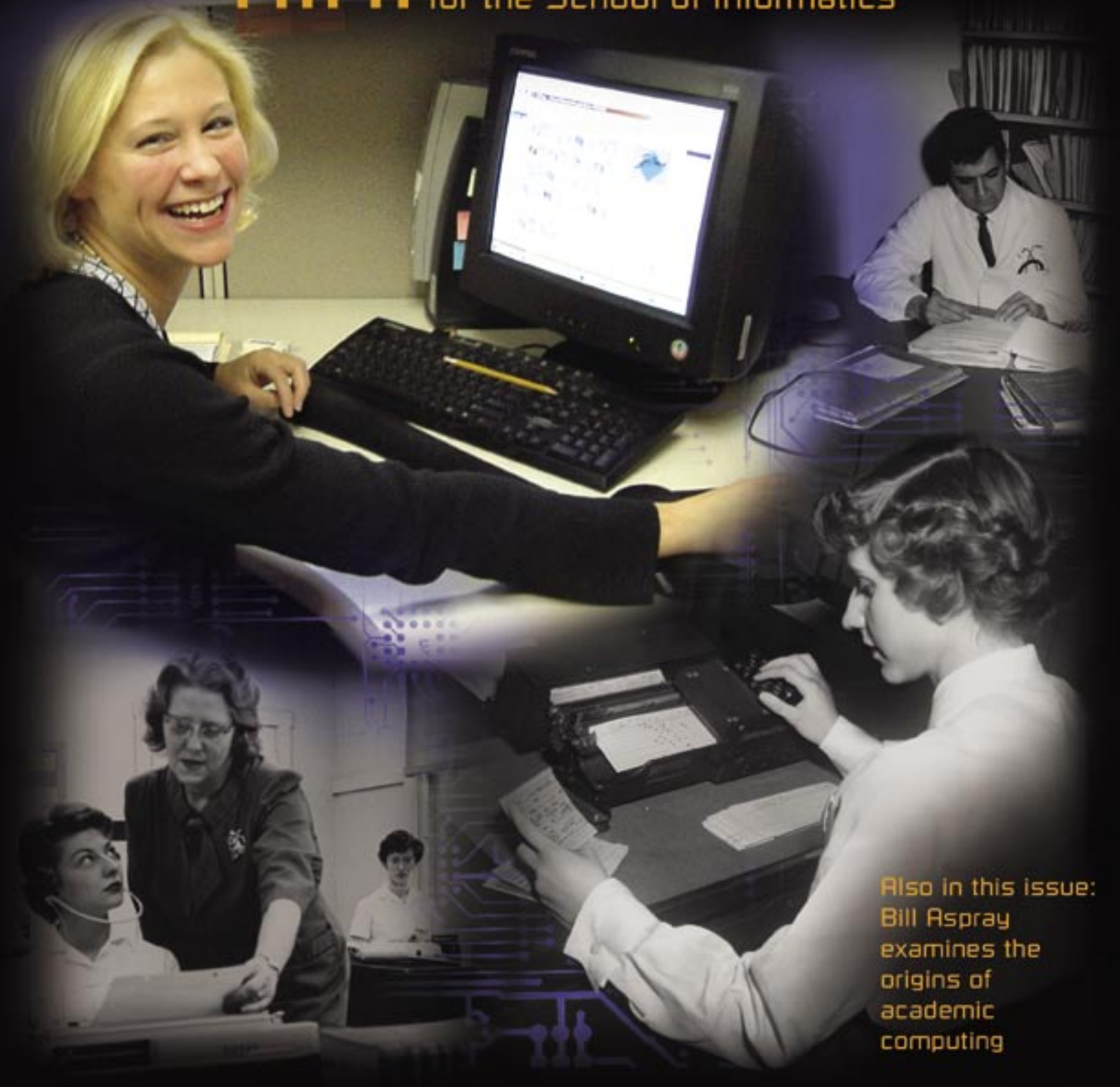


Indiana University School of  
**informatics**

Vol. 1, No. 1 • Fall 2002

**HIA.** A part of the future  
for the School of Informatics



Also in this issue:  
Bill Aspray  
examines the  
origins of  
academic  
computing

# Indiana University School of informatics

Vol. 1, No. 1

FALL 2002

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The IU School of Informatics offers an academic path for students from diverse backgrounds who are seeking a rewarding technology career that combines information technology with another area of study, thus opening varied career opportunities. Just as the discipline of informatics operates in a variety of contexts, the School of Informatics has programs on a growing number of IU campuses. The curriculum focuses on both the technical and human aspects of problem solving and emphasizes innovation and teamwork. The school understands the role of research in building a world-class faculty and in recruiting and educating outstanding students, but also places a primacy on its role in creating new knowledge and technologies for the betterment of people everywhere. The school also is firmly committed to collaboration with industry and government in order to hold up its side of the "three-legged stool" that supports economic growth and progress.

*Informatics* is published by the Indiana University Alumni Association, in cooperation with the School of Informatics, and is mailed to all alumni of the School of Informatics. For information about IUAA membership or activities, call (800) 824-3044 or e-mail [iualumni@indiana.edu](mailto:iualumni@indiana.edu).

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**Cover:** Recent HIA graduate Lena Wilson; historical photos from the early years of the Medical Record Administration program, now the Health Information Administration program. Cover design by Kristina Wood.

# School of Informatics growing rapidly

## *Greetings, Informatics Alumni:*

It's with great pleasure that I use that greeting. It is humbling to think that although the School of Informatics was founded two years ago, we have grown to include more than 735 alumni throughout the state and the world.

The School of Informatics, like the technology at our focus, is dynamic, collaborative, and growing rapidly. Last spring we welcomed our first 23 graduates with a BS in informatics (22 at IUB, one at IUPUI). Our undergraduate and graduate programs in new media at IUPUI have provided Indiana with 118 graduates trained in digital arts. We have a faculty that is growing in size and stature. Our expanding graduate programs in chemical informatics, bioinformatics, human computer interaction, health informatics, and new media will nearly double in size in academic year 2002–03. In the coming year, the Bloomington program will move into the newly renovated Informatics Building. At IUPUI, the state-of-the-art Informatics Complex is taking shape.

Informatics now has the great pleasure of welcoming into our family the alumni, faculty, current students, and friends of the Health Information Administration program. Formerly in the School of Allied Health at IUPUI, the HIA program finds a natural



Michael Dunn

home in the new School of Informatics, where it joins a growing set of programs focused on special uses for information technology. The School of Informatics provides a new context for the HIA's program to produce designers and administrators of health information systems for today's health care industry. So, it is with great pleasure that we devote this inaugural issue of *Informatics* to HIA.

As we enter a new century and even a new millennium, the School of Informatics is a partner with Indiana University to become a leader in absolute terms in the cre-

ative use and application of information technology. Informatics is educating new generations of students in the basic principles of informatics and providing local industry with highly sought-after information technology professionals. Without a doubt, the School of Informatics has an exciting and important role to play in Indiana's future. Informatics alumni, I invite you to join us as we look ahead with great anticipation and optimism.

*Sincerely,*  
*Michael Dunn*  
*Dean, School of Informatics*



## New homes for School of Informatics

### Bloomington's Informatics Building

Once known as the AOPi house, the prairie-style structure at the corner of 10th and Woodlawn has undergone complete renovation, emerging as the new Informatics Building in Bloomington. Near Collins Living Learning Center and facing the Indiana Memorial Union, the Informatics Building joins a number of distinguished neighbors on 10th Street. The four-story structure will provide much-needed facilities for the growing school, including computing labs, a lecture/presentation hall, research space for the Informatics Research Institute, and faculty and administrative offices. Computing facilities are preeminent and include two teaching labs, a usability lab, and custom designed workspaces — dubbed “collaboratories” — for student and faculty research teams.

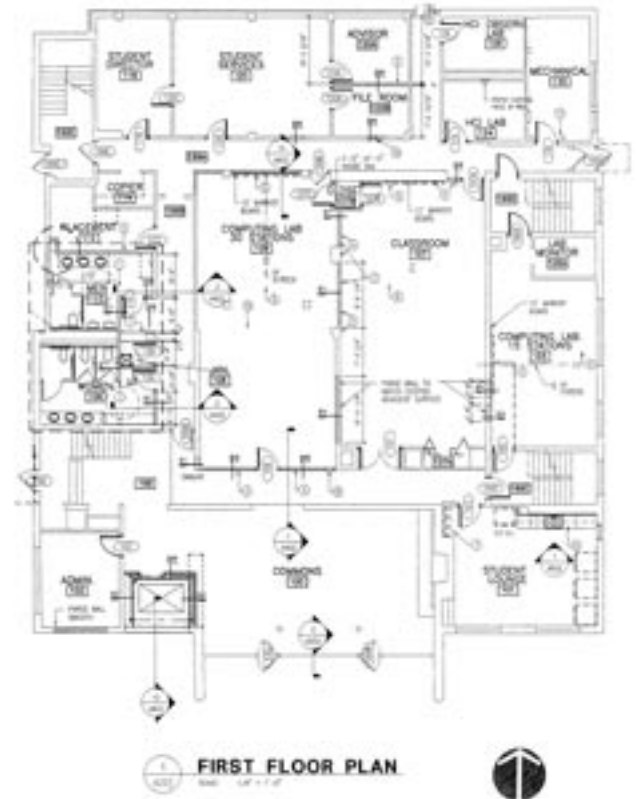
The new building affords the school greater visibility and provides a central meeting place where an already vibrant informatics community of students and faculty can gather, work together, and grow. The school plans a formal dedication of the building early in 2003.

### IUPUI's ICTC

On Oct. 16, 2001, IUPUI held a groundbreaking ceremony for the construction of the new Informatics and Communications Technology Complex (ICTC). The structure will be located at Michigan and West streets and is scheduled for completion in March 2004 (see artist's rendering on opposite page).

The ICTC will be the home for network operations centers for global and national high-speed networks such as the Internet2, the Abilene network, research in pervasive computing, and the development and delivery of IT support services to IUPUI's students, faculty, and staff. The Informatics Complex will be the permanent center for undergraduate and graduate programs in informatics, new media, journalism, and music technology.

The complex is specifically designed with these exciting new fields in mind and will house modern, well-designed learning environments and classrooms. Along with providing an environment for learning the latest in theoretical and technological developments for students at IUPUI, it will also serve as a state-of-the-art facility for innovative work in the fields of



*IUB's Informatics Building consists of four floors. The first two levels, shown here, house classrooms*



information technology for the state of Indiana.

For more information about the ICTC, visit the Web sites for the New Media Program ([newmedia.iupui.edu](http://newmedia.iupui.edu)) and the School of Informatics ([informatics.iupui.edu](http://informatics.iupui.edu)). Views of construction in progress via a webcam, still pictures, and a photo album are available, as is general information about the building itself.



*IUPUI's Informatics and Communications Technology Complex will be located on the corner of West and Michigan streets.*

## School of Informatics, education professor win awards

The Indiana University School of Informatics and educational psychologist Curtis Bonk of the IU School of Education received 2002 Cyberstar awards on May 17 from the Indiana Information Technology Association, a state consortium of high-tech business leaders and professionals.

The two awards in the category Educational Contribution to Information Technology were presented to School of Informatics Dean Michael Dunn and Professor Bonk at a ceremony in Indianapolis. The awards recognize “excellence in the promotion and/or use of technology in the academic realm and success in educational opportunities, research, program growth, student success, or outstanding leadership.” The School of Informatics received the Program and Department Award, and Bonk received the Higher Education Award.

The School of Informatics offers a unique curriculum that combines IT concepts with another area of study, ranging from health care to journalism to biology to economics. IU President Myles Brand, a key force behind the creation of the nation’s first school of informatics, has stated that the school is yet another way in which Indiana University is contributing to Indiana’s future economic growth through development, training, and research in high-tech fields.

Bonk, a member of the IU Center for Research on Learning and Technology and a senior research fellow with the Army Research Insti-

tute, has earned several awards for his contributions to education. He received IU’s Burton Gorman Teaching Award in 1999 and the Wilbert Hites Mentoring Award in 2000. Bonk also founded a company, CourseShare.com, that helps rural Indiana teachers integrate technology into their curriculum.

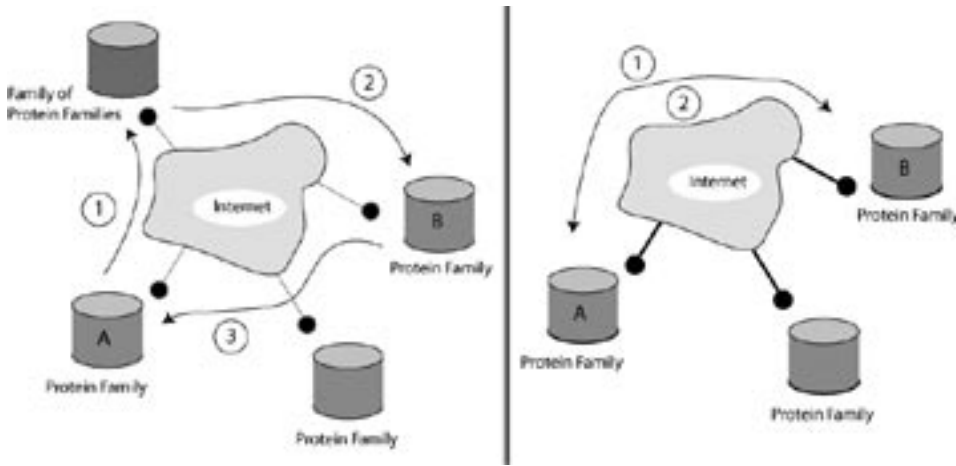


*IU Press release, newsinfo.iu.edu, May 21, 2002*



*IUB Chancellor Sharon Stephens Brehm congratulates Dean Michael Dunn and Professor Curtis Bonk (School of Education) on their Cyberstar awards.*





**Figure 2.** General architecture of PFAP: client-side, stand-alone applications that communicate general information to a repository allowing easy search for any families or applications that communicate using XML and GO.

be Unix-based. Only the “curators” of the information — users with administrative privileges — will have the ability to actually annotate information and choose what portion, if not all, of the information will be viewable on the Web.

The success of this project depends in large part to how “universal” it is — the vocabulary in particular. The Gene Ontology Consortium ([www.geneontology.org](http://www.geneontology.org)) is a concerted, well-supported effort to create a controlled vocabulary — called GO — for biologists who desire to share information. This project will utilize the consortium’s vocabulary, though other sources, e.g., Medline ([www.ncbi.nlm.nih.gov/PubMed](http://www.ncbi.nlm.nih.gov/PubMed)), will be considered too. At this stage, the number of concurrent users, if any, is still being decided. This obviously impacts the architecture.

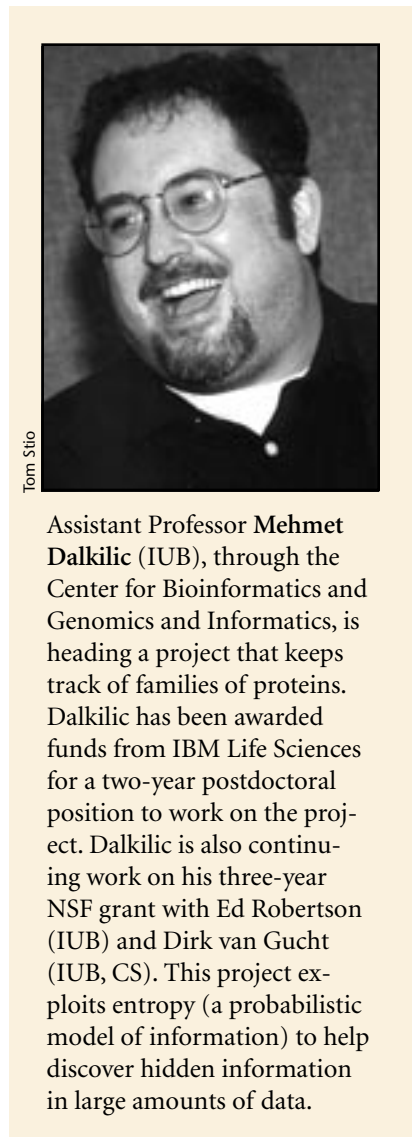
It is clear that the ability to share information among families is desired too. Two approaches have been proposed. The first has a client-side application transparently and periodically conveying general information about the protein family to a server-side information system here at the Center for Genomics and Bioinformatics. The server-side information system functions as a kind of meta database. The second approach utilizes XML and GO to allow direct exchange between applications (see Figure 2).

Some groups may not want to share information at all. Mechanisms for disallowing general viewing via the Web or sharing information will be present.

### Protein Family Annotator (interface)

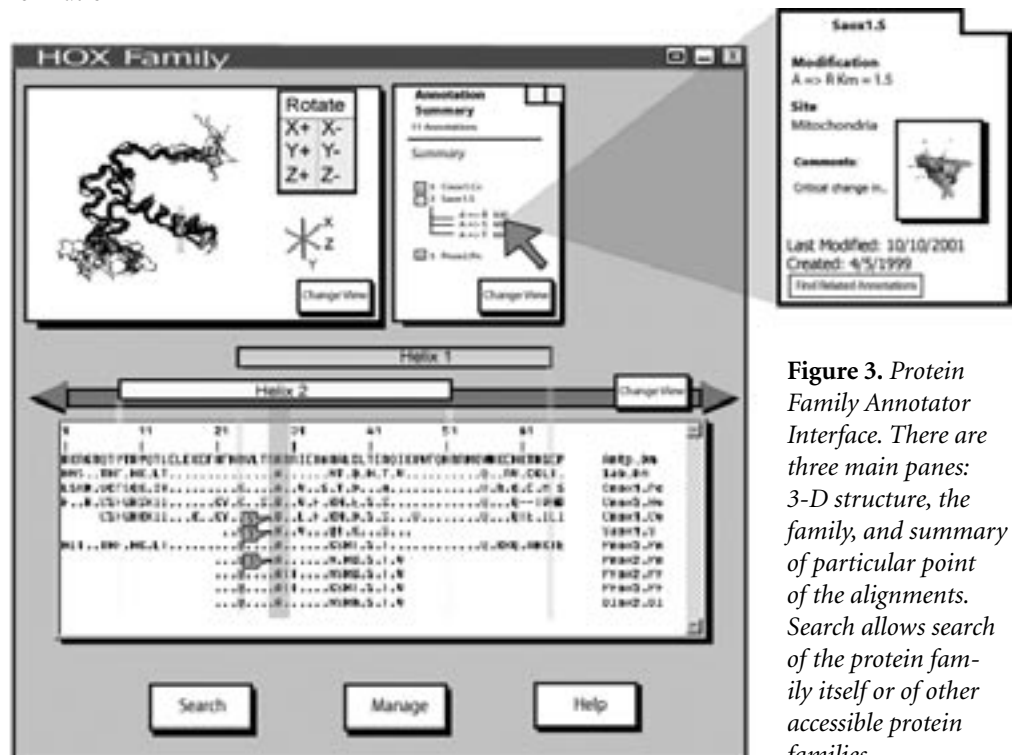
A number of different interfaces to the PFA have been considered. In Figure 3 is a portion of a prototype interface. There are three main panes. The 3-D structure pane gives a 3-D rendering, when possible, of the family — as well as highlighting a residue of interest. The Annotation Summary pane summarizes information along a column of residues in an alignment. The Alignment pane contains an alignment of all the

(continued on page 7)



Tom Stio

Assistant Professor Mehmet Dalkilic (IUB), through the Center for Bioinformatics and Genomics and Informatics, is heading a project that keeps track of families of proteins. Dalkilic has been awarded funds from IBM Life Sciences for a two-year postdoctoral position to work on the project. Dalkilic is also continuing work on his three-year NSF grant with Ed Robertson (IUB) and Dirk van Gucht (IUB, CS). This project exploits entropy (a probabilistic model of information) to help discover hidden information in large amounts of data.



**Figure 3.** Protein Family Annotator Interface. There are three main panes: 3-D structure, the family, and summary of particular point of the alignments. Search allows search of the protein family itself or of other accessible protein families.

## School of Informatics research initiatives

- Assistant Professor **Dan Baldwin** (IUPUI) received a New Faculty Development Grant. The purpose of his research will be to produce a model of convergence art that will explore the combination of traditional media with the latest digital technology.

- Two grants were awarded to Associate Professor **Anthony Faiola** (IUPUI). The first was an IUPUI Summer Research Fellowship Grant for a cross-cultural HCI/usability study, titled “Russian and American Mental Models: A Cross-Cultural Study of Hypermedia and Design and Accessibility.” Faiola was also named as a Fulbright Senior Specialist to Russia, at Moscow State University of the Printing Arts, where he presented lectures and workshops on e-book technologies.

- An initiative from our Informatics Research Institute is “Reciprocal Net, A Distributed Molecular Database.”

This project involves faculty and students from the School of Informatics, the Department of Computer Science, the Department of Chemistry, the School of Education, and UITS in the development of a collection for the National Science Digital Library. **John Huffman**, co-director of the Informatics Research Institute (IUB) is the lead on this project. The data will be collected by research laboratories at a number of major university and government laboratories and will be made available using a database system that can search for — and locate — information from any of the participating laboratories. The central portal for the system will be located at IUB, with additional servers located in laboratories throughout the United States. The project has been funded by NSF for two years.

- The **Informatics Research Institute** has submitted a proposal for the establishment of a “Central Indiana Collaboratory” to the NSF Partnerships for Innovation program. The proposal will establish a collaborative research environment for the major university and industrial research laboratories in the state. This involves an Indianapolis company (BitWise Solutions) and potential collaboration with the Central Indiana Corporate Partnership.

- The IRI is also involved in a proposal to IBM

under their Shared University Research program. This proposal is for a significant upgrade to the university mass-storage facility that would be utilized primarily for research support in the biomedical sciences — focusing on distributed computing and biomedical databases.


- Professor **Sun Kim** (IUB) is partnering with the Center for Genomics and Proteomics in Bloomington to conduct research on DNA sequencing. He continues work on the shotgun sequence assembly problem and the challenges associated with multiple genome comparison. The research of both **Mehmet Dalkilic** and Kim can be formulated as search problems over a huge amount of biological

sequence data. Techniques from string-pattern matching and data mining, if properly used, can significantly reduce the search space.

- The Informatics Research Institute at IUPUI (**Mathew Palakal**, co-director) continues the major project Digital

Cultural Library Indexing Our Heritage. The primary aim of CLIOH is to build a digital archive of endangered and threatened archaeological sites for the use of future scholars. A strong secondary aim is to construct virtual tours of these sites. Work has already been completed on Chizen Itza and Uxmal in Mexico, and work is under way on Angel Mounds in southwest Indiana. The team plans to travel to Cambodia to document Angkor Wat. The project was started with a one-year Leadership Grant from the Institute for Museum and Library Services, and a request is in progress for a two-year continuation.

- **Douglas Perry**, associate dean for graduate studies and research (IUPUI), received an interdisciplinary grant from the Sloan Foundation for the purpose of starting a new master’s program in laboratory informatics.

- Assistant Professor **Susan Tennant** (IUPUI) was awarded an interdisciplinary grant for the purpose of developing interconnected (interdependent) instruction between the Herron School of Art and the School of Informatics. The instruction will focus on the developmental process of creating a professional-quality, digitally photo-documented, interactive portfolio. 





## Dan Baldwin honored for excellence in teaching

In April 2002, Dan Baldwin (IUPUI), assistant professor of Web and multimedia development, School of Informatics, New Media Program, was awarded an IU Trustees' Teaching Award.


The TTA honors individuals who have a positive impact on learning through the direct teaching of students. Recipients of the award must: demonstrate their effectiveness in facilitating student learning, provide leadership on teaching and learning issues, and pursue continuing professional development.

Baldwin has a bachelor of fine arts degree in painting from Indiana University Bloomington and a

master of fine arts degree in illustration from Savannah College of Art and Design, Savannah, Ga.

He has extensive experience in painting, illustration, graphic design, and print layout and design. His professional background includes working as a free-lance illustrator, with a client list of: *Living in Stamford* magazine, *Great Life* magazine, *Charleston* magazine, *House Calls* magazine, Savannah College of Art and Design, and the Indiana University School of Informatics. As a free-lance scenic painter, his client list includes: Allison Transmission, Cisco Systems, Kliptsch, and Argosy Casino. As creative director he has worked with Seeds Sowers, a Christian-based nonprofit organization based in North Salem, Ind., that is dedicated to providing educational and research services. He developed all areas of advertising, including print and Web design, for that organization.

Baldwin's other honors and awards include the Society of Illustrators Los Angeles Bronze Medal (38th Annual Illustration West); Richard G. Rowan Graduate Presidential Fellowship; Harry S. Engle BFA Painting Scholarship; Herman B Wells Matching Grant; and the National Society of Arts and Letters Award.

We feel truly fortunate that Dan Baldwin is a member of the School of Informatics faculty, and we congratulate him on receiving the prestigious Trustees' Teaching Award. 



Assistant Professor Dan Baldwin

## Protein Family Annotator

(continued from page 5)


proteins, the highlighted portion reflecting the residues of interest. Observe the domains above as the highlight moves left or right. If a residue has one or more annotations, the number is displayed to the left of the highlight.

One particular annotation of a residue has been selected, showing a modification and graphic of the mutant type. The Change View button allows some viewer input as to what and how the information is displayed, for example, adding a phylogenetic perspective to the annotation or adding the ability to get to secondary changes that have direct or indirect interaction with the primary mutation; for example, (a) suppressor mutations in a second locus alleviating the primary mutational phenotype (intergenic suppressors) and (b) dominant mutations affecting other loci.

### Conclusion

The Protein Family Annotator Project is a system for managing phenotypic information of a protein family. Though a number of significant challenges exist, the potential benefit to biologists of the PFA is enormous. This is an exciting opportunity for bioinformatics — helping solve problems in biology with information technology.

#### ENDNOTE

<sup>1</sup>For example, even when comparing a small number of family members, say, 10, an evolutionary change in a single residue from the consensus sequence may have been observed in various members and annotated as changing multiple phenotypes. Indeed, experimental studies on the different members probably were performed in laboratories exploring different phenotypic aspects of the protein family. 

# The Origins of Informatics

## Part I

by William Aspray, Professor, School of Informatics

**T**he School of Informatics is one of many academic units related to information technology on IU campuses (computer science, information science in SLIS, information management in the business school, instructional technology in the education school being examples of others). Peter Denning, who chairs the education committee of the Association for Computing Machinery, has identified more than 20 different kinds of information-technology-related academic programs on American university campuses (see table below). Why are there so many different kinds of programs? Why do most research universities have multiple programs and departments devoted to information technology? How did this situation arise?

This two-part history will examine the academic response to the computer and the Internet. It is a complex story, and only a few threads of it can be explored in these pages. This first installment covers the early years, through about 1970, and focuses on computer science, computer engineering, and computing centers. The second installment will include the emergence of other academic computing disciplines and bring the story up to the present time.

The computer — as well as academic interest in it — came primarily as a result of World War II. There had been devices and machines in the universities for doing calculations before the war, but these technologies were regarded merely as tools. Their presence did not lead to the creation of programs to study computing or computers. The world's academic leader in computing in the period between the two world wars was MIT. There, Vannevar Bush and other electrical engineers built specialized calculating devices, primarily for designing electrical power networks and the equipment to operate on these networks in order to help meet the nation's growing demand for electric power.

MIT was not the only university involved with computing in the 1930s. IBM built for Columbia University a specialized calculating machine for educational research that could grade standardized tests. Later in the decade, IBM modified some of its punched-card tabulating equipment (originally designed to tabulate the U.S. 1890 population census) to drive the calculations needed in a national astronomical research laboratory founded at Columbia. A few other universities used less-powerful calculating equipment (typically, standard commercial desk-size accounting machines) for research pur-

poses. For example, Iowa State University opened a calculating laboratory to conduct agricultural research.

In all of these cases, the focus was on using the technology for specific scientific or engineering applications, not on the technology itself. Training in how to build or use these machines was mostly gained through apprenticeship and learning by doing, not by formal course work or the development of any theories of computing. It is doubtful that any course on computing was offered at any U.S. university prior to World War II.

During the war, the Allied Forces, especially the British and Americans, developed high-speed, automatic calculating equipment for a variety of purposes: preparing tables that would tell gunners how to aim newly designed guns and shells, designing the first atomic bomb, plotting optimal strategies to track down and destroy enemy submarines, and optimizing and keeping track of the tangled web of supply lines that fed and clothed the troops — just to give a few examples. Much effort was expended and good progress was made during the war, but the machine that represented the ultimate advance in this area — the computer — was not completed until 1946, a few months after the war ended.

These projects had all been secret during the war, but news of many of them was made public soon after the war ended. As details of the computer became known, academic interest mounted rapidly. Engineers, especially electrical engineers, wanted to know how computers were designed and how to build them. Physicists, biologists, and quantitatively minded social scientists wanted to use these new machines in their research. At that time, the computer was regarded primarily as a giant calculator — as a mathematical computing device — and a number of mathematicians became interested in the numerical methods to be used in making large calculations.

The organizational response to this interest was strikingly quick. The first conference on computing was held in 1945 — at MIT — just a few months

### IT-related Academic Disciplines Offered in the United States

1. Computer Science
2. Information Science
3. Information Systems
4. Management Information Systems
5. Software Architecture
6. Software Engineering
7. Network Engineering
8. Knowledge Engineering
9. Database Engineering
10. System Security and Privacy
11. Performance Analysis (Capacity Planning)
12. Scientific Computing
13. Computational Science
14. Artificial Intelligence
15. Graphics
16. HCI (Human Computer Interface)
17. Web Service Design
18. Multimedia Design
19. System Administration
20. Digital Library Science

Source: Peter Denning, "Information Technology: Developing the Profession," discussion document, Dec. 4, 1998.

# *as an Academic Discipline*

after the war ended. Perhaps a dozen or so major conferences were organized on computing in the late 1940s in the United States and Britain, mostly by universities that had played a major role in the creation of the technology (MIT, Harvard, Pennsylvania, Cambridge, Manchester) or by electrical engineering organizations that were interested in building computers (American Institute of Electrical Engineers, Institute of Radio Engineers). The first professional computing society, the Association of Computing Machinery, was formed in 1947. More than 40 U.S. scientific journals published technical articles about the computer in 1948 or 1949.

The universities soon began their own efforts. By 1947, five U.S. universities had established programs focused on the computer. The electrical engineering school at the University of Pennsylvania, where the machine that is now regarded as the first computer (the ENIAC) was built, established a program to engineer computers. This program did not have

early success because many of the principals from the ENIAC project left to make their fortune building the UNIVAC line of computers.

MIT abandoned its research on (analog) computers for electric power applications after the war in favor of the new digital computing technology that had been premiered at Penn. MIT had a great advantage in doing this work because its faculty could draw heavily on the electronics research that had been conducted during the war in the MIT Radiation Laboratory, where basic radar technology had been developed. In fact, MIT leaped ahead in postwar academic computing through its work on real-time computers. This research was a direct result of the need for computers that could immediately process incoming data from radar tracking stations scattered around the New England countryside as part of a prototype national air defense system.

In Princeton, N.J., at the Institute for Advanced Study, mathematician John von Neumann initiated a project to build

a computer in order to explore how the computer could advance scientific research. The first numerical weather forecasting (now used as part of all major weather forecasting) was one of the results. The institute was a small, independent, elite think tank (Einstein and von Neumann were two of its five professors, and there were no students), but the institute had close ties to the mathematics and physics departments at Princeton University, and these ties led to a university program in computing in the 1950s.

IBM, having had a falling out with Harvard over public credit for a computing machine they had jointly built during the war, decided once again to support Columbia University by building a computing research laboratory there. The laboratory proved to be strong in research on the use of computers in scientific research and on basic research in semiconductor materials that could be used in building switching devices that go into computers. The research was less successful than IBM had hoped in devel-



## Informatics veteran William Aspray joins IU School of Informatics



William Aspray, former executive director of the Computing Research Association, accepted a position as full professor at the IU School of Informatics beginning fall 2002.

As full professor, Aspray will teach and conduct research in the areas of organizational, social, and mathematical foundations of informatics.

Since 1996, Aspray has served as executive director of the Computing Research Association, an educational nonprofit organization that represents the doctoral-granting computing-related academic organizations and industrial and government computing research laboratories in North America. The CRA is the nation's premier organization for

computing research.

Aspray holds an MA in mathematics from Wesleyan University and an MA and a PhD in history of science from the University of Wisconsin–Madison. His previous experience includes teaching at Williams College, Harvard University, and Rutgers University, and research and management positions with two organizations of international standing: the Charles Babbage Institute (a historical research center) and the Institute of Electrical and Electronics Engineers. He has published widely on both historical and contemporary issues facing the computing research community. One recent publication is *The Supply of Information Technology Workers in the United States* (1999, with Peter Freeman), upon which he hopes to build a study of the IT workforce issues in Indiana. Aspray has also published several reports on recruitment and retention of underrepresented groups to graduate school in computer science and engineering.

Aspray is also well-known for his historical writings, which include *John von Neumann and the Origins of Modern Computing* (MIT Press, 1990) and *Computer: A History of the Information Machine* (Basic Books, 1996, with Martin Campbell-Kelly, commissioned by the Sloan Foundation).

Michael Dunn, dean of the School of Informatics, said, "I believe that Bill is a perfect foundational building block for our new school, adding a strong humanities and social science connection, wedded to a deep understanding of the mathematical foundations of IT... It has been said that the School of Informatics bridges the human and the technical. There are few, if any, people better than Bill to support this bridge."

Of the appointment, Aspray said, "I am honored and immensely pleased to be joining this cutting-edge School of Informatics. The state of Indiana, its workers, and the academic community all have much to gain from the interdisciplinary approach of informatics to understand how information technology was applied yesterday and is being applied today, and how it can be more effectively applied in the future."

oping computer systems themselves, and eventually IBM opened its own internal research laboratories and the Columbia lab was closed.

Perhaps the most interesting of the five early academic entrants to the computing field was Harvard, which formed a computing laboratory under the direction of the applied physicist Howard Aiken, within Harvard's small school of

engineering and applied science. Aiken attracted a number of graduate students and postdocs, who were taught not only about building electromechanical and electronic computers, but also about a wide range of applications of computers — from science to business to use in the humanities and social sciences. Aiken insisted that people who studied with him gain a breadth of knowledge; he

would often, for example, assign a student primarily interested in theoretical physics a project on business data processing. The Harvard administration was unwilling to supply adequate resources to a discipline they regarded as less fundamental than physics or philosophy, and Harvard never took full advantage of its early entry into computing.

These were the first five universities to get involved with computing, but they were by no means the only ones. In the first half of the 1950s, more than 20 universities sponsored projects to build computers. Often these projects were set up in the electrical engineering department, where the faculty and students had the interest and expertise to carry out the design. Students could receive their doctorates for developing some part of the computer, and many other graduate students and faculty gained knowledge through the process of design and construction. Because these computers were seen at the time as mathematical machines, computer programs sometimes were established within mathematics departments. The topic of dissertations on computing topics within mathematics tended to be numerical methods associated with the computer rather than the design and construction of the machine itself.

By the mid-1950s, a mainframe computer industry had emerged in the United States, causing rapid transformation in university practice. Except for computers built for special purposes, for example, to explore some novel computer architecture, universities began to acquire computers from the computer manufacturers rather than build their own. This change had several implications. These commercially supplied computers were commonly placed in newly formed academic computing centers, which had a service function for all of the academic departments (and sometimes for the university administration), rather than in the electrical engineering or mathematics department. This service approach may have retarded the development of an academic discipline of computing. Faculty gave new attention to the development of software, such as compilers or operating systems (and to programming languages in the late 1950s and throughout the 1960s), often tuned to the specific educational and research needs of the university. The electrical engineers remained keenly

interested in the digital technologies that were embodied in the computer, but their perspective became slightly more academic once they did not have nuts-and-bolts responsibility for building working machines. The mathematicians continued their interest in numerical methods but also began to explore the theory of computing, adapting techniques and applying results from mathematical logic.

The presence of a computer facility on campus led many other academic units to become interested in computing, such as business schools interested in management of the flow of information in businesses and psychology departments interested in cognitive processes. In these years, Carnegie Mellon organized in the school of industrial relations what soon became one of the strongest U.S. computer science programs, under the direction of Allen Newell and future Nobel Prize winner Herbert Simon. Already by the late 1950s, the University of Michigan had five organizational units across campus with computing programs.

Commercially manufactured computers of the late 1950s and early 1960s tended to be large and expensive, and this placed a serious financial burden on the universities. The National Science Foundation, which had been founded in 1950 before there was much of a computing field, had no programs devoted to computing. NSF made its first grant in the computing field (to John von Neumann) in 1954, to sponsor a conference on the use of computers in meteorology. By this time, various physicists, astronomers, and biologists had started asking NSF for funds to support computing needed in their scientific research. In 1955, a committee led by von Neumann recommended that the NSF supply computers to universities in support of their educational and research missions in science and engineering, in much the same way that NSF paid for large telescopes and other expensive scientific devices that the universities could not themselves afford. The recommendation was accepted, and between 1957 and 1973 the NSF placed the first computer in more than 200 colleges and universities throughout the United States.

In the late 1950s it was not the NSF, however, but the computer manufacturers themselves — IBM especially — that most helped the universities obtain

computers. The industry helped the universities through gifts and deep educational discounts. These programs were not without their downsides, however. By 1959, IBM had supplied its small model 650 computer to about 50 universities, and much larger computers to a few major research universities. IBM required that the schools receiving their computers teach at least one course on computing to their students. A number of schools, in order to qualify for the computer donation, threw just anybody into the classroom — whether the person had the knowledge or interest to do the job right. There was also concern among academics about IBM's impact on university curricula, which seemed to be result-




ing in too much emphasis on practical applications.

Stanford, today one of the world's academic leaders in computing, began its connection to computing when the mathematics department hired numerical analyst George Forsythe in 1956. Frederick Terman, the famous provost of Stanford who helped to build Silicon Valley, had learned about computing from his doctoral thesis adviser, Vannevar Bush. Terman had a strong interest in building a computing program at Stanford, and in 1958 he commissioned a study by a consultant, Louis Fein, on the state of academic computing in America in order to help him better understand

what Stanford should do. The report was eventually published in what was probably the premier professional computing journal of this time, *Communications of the ACM*, and was widely influential in starting a national debate on just what should be taught about computing in universities. Fein emphasized the need for greater emphasis on theory of computers, theory of programming, and theory of applications.

The publication of Fein's report and the interest that it engendered led the ACM to develop a model curriculum, drafted in 1965 and published in final form in 1968. This curriculum was extremely influential in establishing what should be taught in a university computer science curriculum. In 1970, the other main computer professional society, the IEEE Computer Society, published its first model curriculum — directed at a curriculum with a greater engineering emphasis. These curricula were timely. The first doctoral programs in computer science were formed in 1962 at Penn and Purdue, and the first doctorate in computer science was awarded by Penn in 1965 (to Richard Wexelblat). By 1972, almost 100 doctoral programs in computer science and computer engineering existed in the United States — representing half the ones that exist today. Because of the scarcity and expense of computing resources, as well as the perceived difficulty of computing, computer science and engineering was offered at first only at the graduate level. Starting in the late 1960s, universities began to extend these offerings to undergraduates. Thus by the early to mid-1970s, academic computer science and education had achieved a maturity and looked, in many respects, very much the way it looks today.

Other kinds of academic computing programs were developed beginning in the 1960s, and academic innovation in how to package computing-related research, teaching, and workforce development continues to this day. These will be the topics for the next installment of this history. 

# Health Informatics

## A Part of the Future for the School of Informatics

In July 2002, the Health Information Administration Program, formerly a program in the School of Allied Health, became a part of the School of Informatics.

Indiana University's Health Information Administration Program, originally known as Medical Record Administration, was the first in the United States to be established in a state university. More than 500 bachelor's degrees in health information administration have been granted since the first student graduated from the program in 1952.



The program finds a natural home in the new School of Informatics, where it joins a growing set of programs focused on special uses for information technology, including a master's program in health informatics. The School of Informatics provides a new context for the HIA program to produce designers and administrators of health information systems for the state's health care industry.

Michael Dunn, dean of the School of Informatics, described the appropriateness of the inclusion of the new program in the School of Informatics: "Health care has become an information-intensive field. Health care providers must manage an ever-ex-

Health information management, where health care meets the cutting edge of information technology, is listed by the U.S. Department of Labor as one of the 20 fastest-growing occupations in this country. The same agency projects a 44 percent increase in the need for health information professionals through the year 2006.

panding amount of information, from complex billing systems to the need for improved classification, storage, and analysis of medical information. The School of Informatics is the perfect home for the HIA program because the school focuses on training students to find the best technological solutions to the problems of a given profession. The school is proud to have the Health Information Administration program and its distinguished alumni, who have made critical contributions to the success of the health care industry in the state."

The course of study consists of three years (90 hours) of prerequisite work. Once this course work is completed, students may apply for admission to the professional program. Each year, 20 students are admitted to the fourth year, or professional, segment. Selection is based on a review of each applicant's academic achievement and an interview. Students from any accredited university or college who have completed the prerequisites may apply for the professional program.

The professional curriculum focuses on the management of health information systems and utilization of computerized clinical data. The course work integrates lecture and laboratory courses with technical and professional practice experiences in a variety of health care settings. The professional program requires completion of 40 credit hours taken sequentially during the fall, spring, and summer I sessions and is offered only on the Indianapolis campus.

The program is designed to prepare students to assume the responsibilities of health information administration professionals in such settings as hospitals, physicians practices, cancer registries, managed care facilities, consulting companies, and rehabilitation centers. Health information administrators are skilled in the collection, interpretation, analysis, and protection of patient data. Graduates of the program can serve as directors, managers, consultants, and information security officers. They design health information systems to assure that data are accurate and consistent with legal and ethical principles and that patient confidentiality is maintained.

Danita Forgey, who has been associated with the program since 1994, is the director. She earned both a bachelor of science degree in medical record administration and a master of information science degree from Indiana University.



*Danita Forgey, director of the HIA program*

# on Administration

## HIA Alumni Profile: Carol A. Lewis

Carol A. Lewis had two simple goals when she enrolled in the Medical Record Administration program at Indiana University. She was looking for a program that would allow her to graduate in four years, and she was seeking a career that would give her the opportunity to travel. She was able to fulfill both of those aspirations and accomplish much more in her long and distinguished career in the field of health information administration.

Born in Guatemala in 1931, Lewis spent her childhood with her family in that country. After the family returned to the United States, her father accepted an appointment as a Purdue professor in 1946.

Lewis earned a bachelor's degree in medical record library science from Indiana University in 1953 and a master of public health degree from Johns Hopkins University School of Hygiene and Public Health in 1968. She has also done postgraduate work at George Washington University Graduate School, Washington D.C., and the Massachusetts Institute of Technology, Cambridge, Mass.

### Career highlights

Her first job upon graduating from IU was as chief medical record administrator at Larue D. Carter Memorial Hospital, Indianapolis. During her tenure there, Lewis began to develop procedures and assisted in the formulation of standards for medical records. After two years, she joined the U.S. Public Health Service.

During her 20 years as a commissioned officer in the USPHS, Lewis held a variety of positions. Her first position was as deputy chief at the USPHS Hospital in Baltimore, Md. While working there she served as assistant to the chief of the Medical Record Service and director of the School for Medical Record Librarians. She was responsible for the overall supervision and direction of the hospital's medical record program and assisted in the instruction of medical record students. She was then loaned to the Pan American Health Organization, with duty stations first in Buenos Aires, Argentina, and then in the Washington headquarters. Following her return to the USPHS, as a member of multidisciplinary health services

research team, Lewis was specifically responsible for adapting the University of Michigan Medical Record and Admitting Staffing Methodologies to the PHS Hospital System, applying the methodology at six hospitals and evaluating the results.

Following completion of her MPH and an assignment as chief of the Medical Record Branch, Federal Health Programs Service, Public Health Service, she was named director of the Office of Program Planning and Evaluation, FHPS, where she was directly responsible for the development, execution, and coordination of program planning and evaluation for

*(continued on page 17)*



*IU medical records administration graduates from the 1950s*

# *The health information management profession: A retrospective*



Man-**M**ankind has long recognized the need for recording medical information. Prehistoric cave paintings illustrate treatment of the infirm in depictions of amputations and even brain surgery. The oldest surviving examples of actual medical records are papyrus from ancient Egypt that contain details of the successful treatment of ailments.

Some of the earliest records for individual patients can be found in the archives from St. Bartholomew's Hospital in the United Kingdom and date back to A.D. 1123. Both the New York Hospital and the Pennsylvania Hospital began recording individual patient information — name, address, and illness — around 1790.

The Massachusetts General Hospital, founded in 1821, maintained some of the most comprehensive records of the day. They included data complete enough to enable the cataloging of diseases and operations. By the mid-19th century, it was common practice for physicians to keep individualized patient records in the form of narrative descriptions.

As people became more interested in the causes of illness, the importance of detailing medical practice became more evident. A significant influence on the early development of the health information administration profession was the realization that in





order to assess and improve the quality of physician education and patient treatment, data provided by patient records were crucial.

In 1902, the American Hospital Association included medical records as a topic for discussion at its annual meeting. At about the same time, the American College of Surgeons established minimum standards and began to survey hospitals to see if those standards were being met.

The American Health Information Management Association traces its beginning to 1928 when the ACS established the Association of Record Librarians of North America to further improve clinical records standards in hospitals and other medical institutions. In 1938 the association changed its name to the American Association of Medical Record Librarians and continued to improve standards and regulations, establishing its members as experts in medical records. In 1970, the association changed its name to the American Medical Records Association.

Early in the 20th century, members of a voluntary hospital-accreditation body including the ACS, AHA, American College of Physicians, and the American Medical Association established and maintained accreditation activity. In 1952, the member organizations formed the Joint Commission on the Accreditation of Hospitals. As the accreditation process grew to include all types of health care organizations, the accreditation commission became known as the Joint Commission on the Accreditation of Healthcare Organizations. The JCAHO is instrumental in setting standards for quality patient care.

In the second half of the 20th century, improvements in education in many countries led to higher expectations in health care. Medical record keeping must now be responsible for providing more and better patient data, including: health history of the patient and his or her immediate family, information about social issues, information relevant to an individual's psychological well-being, and even a patient's perceptions of illness. Patient information has also become important as a means of communication between physicians, and medical records are used to cross-reference and deliver core data about diseases and the treatment of them.

As the importance of the medical record has evolved, so has the role of the health information administrator. In the last two decades of the 20th century, phenomenal growth in terms of the amount of data available requires increasingly sophisticated methods of retrieving and storing this vital information.

These innovations led the AMRA to change its name again in 1991 to the American Health Information Management Association. This, its current name, is more reflective of the profession as it strives to apply modern technology to and advance best practices in health information management.

Medical records are no longer simple notes kept in a ledger by a physician. The expectations of the health information administration profession now include formation of a set of historical documents for each patient, supporting communication between physicians, clinicians, and financial and administrative staff; providing statistical information to aid in the anticipation of future health problems; describing preventative measures; identifying deviations from expected trends; providing information necessary for legal action; supporting

clinical research; enhancing the efficiency of health professionals; supporting continuing professional assessment and medical education; accessing medical knowledge bases; assisting with audits; and facilitating management tasks.

As recently as the mid-1900s, the profession was largely viewed as a field for women only, whose primary function was to record and file patient records. Most universities with a program in medical records included in the curriculum courses in shorthand and typing. Those classes have been replaced with courses in anatomy, physiology, computer science, accounting, communications, and management.

As paper-based medical records are being converted to computer-based records and systems, health information management professionals are serving in an ever-expanding variety of roles. These professionals are active partners with computer system professionals and health information users in the planning, design, and implementation of computer-based health information systems. The medical record is a key element in patient care, the education of health care providers, and in critical decision making on many levels. The health information administration profession has and will continue to be essential to quality health care.



# Health Informatics at IUPUI

The master of science degree, offered by the School of Informatics on the Indianapolis campus, is helping to meet the needs of a rapidly changing health care environment. Currently, there is a critical need for health information professionals prepared at the graduate level to meet the increasing breadth and depth in the areas of computerized patient records, cost reimbursement, and integrated health information systems. Research and educational programs in medical, nursing, and health informatics are growing at an astounding rate nationally due, in large part, to the ever-increasing complexity of all aspects of the health care industry.

Users of health information include clinicians, researchers, health care educators, health organization administrators, health policy analysts, health information administrators, quality improvement directors, chief information officers, and almost anyone involved in the health care industry. Those who are professionally involved in health informatics work in a variety of settings, including acute care hospitals, managed care organizations, consulting firms, claims and reimbursement organizations, accounting firms, home health care agencies, long-term care facilities, corrections facilities, pharmaceutical companies, behavioral health organizations, insurance companies, state and federal health care agencies, and health computing industries.

The IUPUI campus is uniquely suited to conduct graduate education in health informatics through its health schools, research centers, and affiliated academic units:

- The School of Medicine has a long history of fellowship

training and research in medical informatics.

- The internationally recognized Regenstrief Institute for Health Care conducts health services and medical informatics research.

- The School of Nursing, which is the largest in the country, is at the forefront nationally in the development of nursing informatics. Recently, the School of Nursing established the CIC Clinical Nursing and Health Information Consortium with three world-class research institutions to stimulate collaborative research and education.

- The School of Library and Information Science offers, among others, master's and doctoral degrees in information science. SLIS also has a broad research thrust exploring the interconnection of social, behavioral, and technological issues associated with the use of information and communication technologies.

- The Department of Computer and Information Science offers an MS in computer science. Through this program, the department has faculty and research resources that support critical computer science requirements of the MS in health informatics. Moreover, faculty in the department are externally funded to conduct research in medical informatics and bioinformatics.

- The Health Information Administration program, offered through the School of Informatics, is a baccalaureate program that prepares professionals to plan and manage health information systems. The curriculum is grounded in computer systems, health law, medical documentation, and organizational management.

In addition to the offerings listed above, academic programs at Indianapolis in public health, applied health sciences, and hospital administration offer important supporting course work.

This strong interdisciplinary approach to the program is also evident in the work of Anna McDaniel, director of the Health Informatics program in the School of Informatics and associate professor at the School of Nursing. McDaniel received both her bachelor's and master's degrees in nursing from Ball State University and earned her doctor of nursing science degree from Indiana University in 1991.

With her clinical background in critical care nursing and more than 20 years of experience in teaching undergraduate and graduate nursing students, McDaniel brings a strong teaching and research background to her role in the School of Informatics.

*(continued on page 17)*



*Associate Professor Anna McDaniel is director of the Health Informatics program.*

## Alumni profile

(continued from page 13)

the PHS Hospital and Clinic System. She also served as a project officer for one of the original Experimental Health Services Delivery System projects funded by the National Center for Health Services Research and Development. Following this position she was reassigned to PAHO.

Lewis served as the regional adviser in health records, PAHO, in Washington, D.C., from 1964 to 1966 and from 1973 to 1979, where she advised national health services and hospital authorities in more than 30 countries of Latin America and the Caribbean on the development and evaluation of health record systems and health information systems. She also promoted the organization and development of courses for health record personnel and served as an instructor.


Lewis has served as a consultant to the World Health Organization in Geneva, Pan American Health Organization, United Nations Fund for Population Activities, and for private consulting firms. In this capacity she has provided guidance on the design of the medical record component of the national health information system, design, implementation, and evaluation of primary health care records and design implementation, as well as evaluation of health information systems in general. She has collaborated in the preparation of guidelines for medical record practice and medical record evaluation, in the evaluation of national disease control programs and immunization programs and has served as instructor on the International Classification of Diseases and courses on hospital cancer registries and on supervisory skills for primary health care.

Inspired by the example set by Gertrude Gunn, founder of the Medical Records Administration program at Indiana University, Lewis has been involved in the work of the health information administration profession on both the national and international levels throughout her career. She has been an elected board member, educator, trainer, author, forecaster, accreditation reviewer, and speaker. She was a member of the editorial review boards of the *Journal of the American Medical Record Association* and has served on the editorial review board of *Topics in Health Information Management* since the journal was established.

From 1974 to 1981, Lewis served as a member of the American Medical Record Association's Panel of Accreditation Surveyors, providing valuable advice and counsel to a large number of developing and continuing educational programs.

In 1980, having been appointed by the AHIMA board of directors to serve as AHIMA's representative on the IFHRO Grand Council, Lewis was elected vice president of the International Federation of Health Record Organizations, and in 1984 was elected president of that same organization. She presided over the IFHRO's meeting in October 1988, when the United States was the host country for this international congress. She has been a longtime member of the IFHRO Education Committee and has helped organize and conduct workshops held in conjunction with international health record conferences and also in the People's Republic of China, including one to be held in Guangzhou in November 2002.

Lewis received the Distinguished Member Award of the American Medical Record Association in October 1987 in Baltimore, Md. This is the highest award given to a member of the American Medical Record Association (now the American Health Information Management Association). She continues to serve the association and currently is a member of the Foundation of Research and Education board of directors and of the IFHRO 2004 Congress Organizing Committee.

Carol Lewis has had a highly productive and distinguished career in the health record field. She has been a guiding force in activities that led to the restructuring of AHIMA and the institution of competencies for today's health record practitioner. Lewis is responsible for the establishment and continuing development of health record practice in more than 30 countries in the Western Hemisphere and has devoted dedicated service to the enhancement of health records in the Americas. She is respected by her colleagues and the health information administration community at large for her contributions to the development and enrichment of the profession. Carol Lewis is internationally recognized as a professional whose pioneering efforts have influenced and improved the quality of life for countless people in many countries. 

## Health Informatics at IUPUI

(continued from page 16)

The focus of her research is on the use of technology to support smoking cessation and nicotine-dependence treatment. She has received external funding to support her research, the results of which have been published in national and international scientific journals.

One of McDaniel's projects involved a team of five undergraduate students in new media and led to the development of an interactive, multimedia computer program to promote smoking cessation in low-income women. The focus of a more recent intervention study is smoking prevention for pre-adolescent girls. With grants from the Indiana State Department of Health and the Indiana Women's Commission, McDaniel developed and tested an interactive computer program that was based on gaming technology and aimed

at empowering girls ages 8–14 to resist taking up smoking behaviors.

According to McDaniel, there has been a high degree of interest in the program, including people without the typical background in health care. These students enter the program from a wide variety of work and educational environments, which enhance the educational experience for all students. They also bring with them different learning needs — the program is specifically designed with the flexibility necessary to meet those needs.

The commitment of the School of Informatics is to continue to strengthen the curriculum and build partnerships with businesses and organizations. This will enable the program to provide high-quality learning opportunities for students and be responsive to both the needs of the students and the health information field as a whole.

## Student Council presents 'Power of Three' seminars

This spring, the IU School of Informatics at IUPUI and the Informatics Student Council presented three workshops aimed at career enhancement. The first, on March 22, addressed copyright law and was conducted by Professor Kenneth Crews. Copyright law is having an increasing effect on almost every aspect of informatics, particularly new media. Crews addressed questions of ownership and fair use of copyrighted works, offered updates on the latest developments, and answered a wide variety of questions about copyright law as it relates to multimedia, video, music, and art.

Professor Stephen Hundley covered the area of résumés and interviews on March 29. This session centered on identifying the knowledge, skills, abilities, and other characteristics that individuals possess and learning how to market that skill set to employers. Hundley spoke specifically about the types of information that should be included in résumés and cover letters and shared important networking and interviewing techniques.

The last workshop in the session, held on April 5, was conducted by Professor Dan Baldwin. Baldwin, who has an extensive background in painting, illustration, graphic design, and print layout and design, shared his expertise with students on the topic of portfolio development. A portfolio will be an important part of the job application process for most of the graduates of this program, and Baldwin was able to give those in attendance some very valuable information and direction on this important subject.

Attendees included graduate students, undergraduate students, faculty, and staff from various schools at IUPUI. Their comments confirmed that all of the sessions were interesting, relevant, and informative. The Student Council hopes to be able to provide



*Informatics Student Council members, from left, Rich Anderson, Becca Paul, and Lori Shuck helped organize the "Power of Three" seminars. Not pictured: Bryan Martin.*

more opportunities like this in the near future. The School of Informatics extends thanks to the IUPUI Student Council leaders — Rich Anderson, Bryan Martin, Becca Paul, and Lori Shuck, — for developing and facilitating these workshops.



## IUB Commencement, May 2002



Tom Stio

The IU School of Informatics congratulates the first graduating class in Bloomington, the state's first recipients of the BS in Informatics, including: front row, from left, Jeremy Shermak, Aaron Holloway, Joshua Froelich, Susanti Kuswardani, and Megan Lewis; second row, Laura Baker, John Marburger, Michael Railing, Matthew La Master, and Michael Hunsaker; and third row, Sean Ellis, Jon Ziemer, Heechun Yoon, and Nicolas Smith. Graduates not shown are Seth Brown, Brian DeKemper, John Fox, Nicholas Harpe, Nicki Kie, Yong Jun Kim, Aaron La Sota, Jennifer Todhunter, and Michael Turoff.

## IU Informatics Club



Tom Stio

Graduating founders of the IU Informatics Club (IUB) were recognized at a reception honoring Bloomington's first graduating class of informatics majors. Officers are, from left, John Marburger, founder and co-president, 2000–01; Matthew La Master, founder and co-president, 2000–01; Nicolas Smith, treasurer, 2000–01; Laura Baker, secretary, 2000–01; Sean Ellis, president, 2001–02; and Megan Lewis, vice president, 2001–02. Faculty adviser Mehmet Dalkilic is in front.

## Informatics students team with WFYI

Five students from the IU School of Informatics on the IUPUI campus recently completed a project that will save WFYI thousands of dollars.

As a semester-long project for an interactive media applications course, they chose to develop a CD-ROM to help WFYI raise funds for their capital campaign. The CD-ROM provides information about the station and describes how contributions will be used to transfer the station from analog to digital. The students also solicited several donations to cover much of the cost of the software they used and the salary of a professional voice-over artist. The station plans to give the finished product to prospective donors and use it in presentations about the campaign.

"The students were able to take a complex subject and explain it through visual effects, making a strong case for support and saving WFYI thousands of dollars," said Jeanelle Adamak, executive vice president of WFYI.

According to the students' professor, Dan Baldwin, professional companies would normally charge about \$35,000 to \$50,000 to produce a similar product.

Professor Baldwin believes working with real clients has benefits for everyone involved. "Having an understanding of the software is one thing, but having an understanding of the client relationship is a totally different idea. That's something you really can't teach in class," he says. "It's also a great way for the community to see what kind of great work is coming out of IUPUI and the new media program, especially."

IUPUI graduate student Joe Boda, senior Mike Sharp, and juniors Jason Yavor and Jeremy Spurgeon, participated in the project.



## A note from the director of development

*Dear Informatics Alumni and Friends,*

In the past century, the rise of the computer age was marked by innovation, risk-taking, and immense reward. So many great inventions, which we now take for granted, were once only dreams in the minds of a few who dared to look for new applications of technology and take risks to make them a reality.

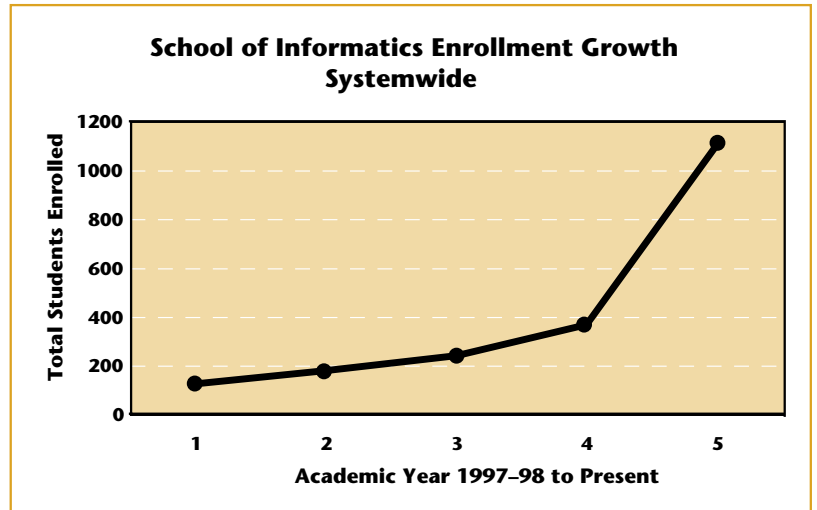
The School of Informatics, owing much to this tradition, began as a daring idea at Indiana University. Though it is still in its fledging stage, already, the great idea of a school that studies the application of information technologies is beginning to show significant success.

The graph of our enrollment in the School Informatics begins in 1997 with the forward-thinking students who gambled on a new program at IUPUI called New Media. Now widely respected and producing successful graduates, that program is the foundation of informatics at IUPUI. By the time the School of Informatics received official approval from the Higher Education Commission in 2000, a new cohort of visionary students had joined the ranks. System wide, nearly 400 students, seeing the value of a major unfamiliar to many employers, became informatics majors. These first informatics majors took the risk, and many are now poised to become leaders in their professions.

2002 brought the Health Information Administration (HIA) program into the School of Informatics, reminding us all that the spirit of innovating and embracing the new is an established part of the IT culture. Including HIA, the School of Informatics currently numbers around 1,000 majors, and it con-

tinues to grow.

Of course, the future success of the School of Informatics will be shaped by three groups of people: great students, world-class faculty, and devoted alumni and friends. As the director of development, I



hope to assist these friends of the School of Informatics in their ongoing efforts to build a solid foundation and future of support for the school.

Our school is off to a great start! Our thanks go to alumni and student donors: Brian De Kemper (IUB) and Jill Goodwin (IUPUI) for being the first on their respective campuses to donate \$20.02. Thanks also go to other early donors: Matt La Master, Sean Ellis, and Michael Hunsaker. They set the standard for devoted and involved alumni. In the near future, more of you will have the opportunity to join them.

Welcome!

— Diane Ward  
Director of Development

Stay connected to IU  
with membership in your  
Alumni Association.  
We're just a click away.



[www.alumni.indiana.edu](http://www.alumni.indiana.edu)

### Enjoy member benefits:

- Alumni online directory
- Alumni online career center
- INDIANA ALUMNI MAGAZINE
- Network of 100 alumni clubs worldwide
- 26 school and campus alumni associations
- Discounts on hotels, rental cars, and IU merchandise

### Membership supports:

- Programs that provide scholarships
- Commencement ceremonies
- Student recruiting and student organizations

## Visions become realities for informatics graduates

### Josh Froelich

Last May, Joshua Froelich participated in history when he became one of IU's first recipients of the bachelor of science in informatics. As one of the state's first informatics graduates, Froelich is employed at Megaputer, a small business that specializes in selling analytical software with applications that range from data mining to search engines. He's found that his informatics degree has helped him along the way, providing him with solid skills and tools for problem solving.

Like anyone who works for a small tech company, Froelich is covering a lot of bases. A systems analyst, Froelich's current project is an information portal geared towards all of Megaputer's sales staff and business managers. Froelich says that most of his day involves "solving problems on the fly, creative planning and brainstorming, aiding in communication and understanding of things between people." He jokes, "If you ever come up with a great job title for me, that would be great. I still don't know what to call myself."

Perhaps the best title is *informaticist*.

Froelich's education in informatics and his work experience at Megaputer have given him breadth, flexibility, and the ability to blend technology with his professional interests. He's worked in advanced Web development and design, exhibited Megaputer at conventions, and worked directly in sales. Froelich has participated in the planning, documentation, and execution of large custom software projects, and handled product support. He's worked with initial distributor agreements and aided new distributors in coordinat-

ing sales and marketing approaches. Froelich has also prepared competitive intelligence reports, including basic SWOT analyses (strengths, weaknesses, opportunities, threats).

In the near future, he hopes to be working more closely with the research and development department to help sales, working with a specific system called WebAnalyst (read more about it at the company Web site, [www.megaputer.com](http://www.megaputer.com)). This system serves many functions, and is on the forefront of modern applicable data analysis. One of its features is the cross-selling of associated products from a Web site — you may have noticed this sort of thing at Amazon.com when you buy a book. Another feature is dynamic personalization, where the software actually alters the available paths on a site to try and sell more to visitors or just better their experience.

Froelich says that while he has excellent technical skills, it never seems to be enough. "I literally use some of the informatics textbooks as reference guides, for things like product usability, information systems design, innovation diffusion, and so on."

### Michelle Hamblen

Michelle Hamblen, who received her bachelor of science in media arts and science from IUPUI in December 2001, is the recipient of the Gov. Bob Orr Entrepreneurial Fellowship.

The purpose of the fellowship is to retain some of our state's best and brightest college graduates. Currently, six entrepreneurial companies are represented by a group of executive leaders whose goal is to find

and train the next generation of Indiana entrepreneurs.

This is the first year the fellowships have been awarded, and the response has been overwhelming. Applications from 850 students were received during the first phase of the process. That number was narrowed to 13 by the committee, and each of the 13 finalists interviewed with four of the participating companies. Hamblen was one of nine selected from the 13 to be offered a full-time, two-year position in one of six companies.

Hamblen began working at Angie's List on May 15. She is responsible for  
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Michael Dunn, dean of the School of Informatics, congratulates new Bloomington graduate Joshua Froelich during the May 2002 commencement ceremonies.

Tom Stio

# IUPUI Teacher's Resource Center thrives under leadership from School of Informatics graduate

Debra Robertson graduated with the first master's class in the New Media Program at IUPUI. She received her MS in media arts and science in December 1999. Currently, she serves as the project manager for the Community Learning Network's Teacher's Resource Center at IUPUI.

Prior to becoming a student in the New Media Program, Robertson was working in the field of medical technology and had started pursuing a degree in engineering at IUPUI. In summer 1998, while she was in the process of enrolling her daughter in a summer computer class at IUPUI, she

was introduced to the New Media Program. As the result of a meeting with Assistant Dean Mark McCreary, Robertson, her daughter, and her husband all registered for a Web-authoring class that summer.

Once she started in the class, Robertson knew this was the degree she had been looking for. When she began her study, the program was still in its infancy; in fact, it was then a program in the School of Engineering and Technology. Robertson was aware that this was a new field where changes were constantly taking place. One of the most exciting things about this area of study was the opportunity to be

involved in a cutting-edge technology at its inception. Because of this, Robertson learned how to complete tasks using novel methods. She developed problem-solving, networking, communications, and team-building skills. Through her work on class projects, she learned to analyze the assigned task, organize the approach, evaluate and modify the work while in process, and create a complete product. She quickly realized that innovative thinking was required for success in the program.

The Teacher's Resource Center was originally the brain-child of Raytheon Corporation. In 1997, when Raytheon came to Indianapolis to privatize the Naval Air Warfare Center, it agreed to give a portion of its sales back to the community. Raytheon designed the Teacher's Resource Center in an effort to assist teachers with hands-on math and science projects in their classrooms. During summer 2000, plans were made for Raytheon to partner with the IUPUI Community Learning Network for this project, and it was at this point that Robertson became an integral part of the endeavor.

As Robertson stepped in to oversee the TRC, student learning kits (which had already been assembled by Raytheon) were moved to IUPUI. There were some problems that needed to be addressed immediately,

including the cost and time required in collecting supplies and marketing and distributing the kits.

Robertson began reorganizing materials and creating forms, particularly for tracking materials. The initial design of the ordering process was extremely cumbersome because it required that teachers complete a form (either hard copy or on the Web) with no knowledge of the availability of learning kits. Robertson improved the Web site through the implementation of a database. Teachers can now access an online calendar for the kits and place their orders accordingly.

The project moved forward quickly and Deb realized how invaluable the computer, programming, and presentation skills she had learned in the New Media Program were. She created marketing materials and promoted the center to schools and local businesses. Robertson has also successfully written numerous grants to help underwrite both the entire program and to develop specific training modules designed to aid classroom instructors in the effective use of the materials.

When Robertson started, the program was reaching approximately 150 students each month. By July 2001, the program was reaching 1,000 students per month on a regular basis. Currently, the program provides Marion County and seven surrounding counties with kits for 2,000 students each month. The resources are now available to public, private, charter, and home schools as well as youth organizations.

Most of the kits are based on the Great Explorations in Math and Science guides and the Outdoor Biology Instructional Strategies from the Lawrence Hall of Science at the University of California at Berkeley. These activities have been field tested and proven to provide exciting and effective ways of teaching concepts that are often difficult for students. The kits are correlated with the Indiana Academic Standards, which are becoming more and more important to teachers. Beginning in 2003, science will be added as a category in the ISTEP tests.

The Teacher's Resource Center is a nonprofit 501(C)3 organization that receives support from local businesses. Raytheon supplied the original kits plus annual funding. That funding has been increased based on the expansion of the program. In 2000, IUPUI Community Learning Network partnered with Raytheon to provide in-kind support. Several attorneys from Baker & Daniels will volunteer some of their time in the coming months to assist us in grant-writing endeavors. Another sponsor is CVS, who has developed and funded a kit about poison control, designed for children in grades two through six. Local Optimist clubs have also contributed monetarily, and the National Starch and Chemical Co. provides all the corn starch for the Oobleck kits. The



*Debra Robertson*



Teacher's Resource Center is listed as a charity with Marsh Supermarkets. Anyone with a Marsh card can go to the company Web site and designate the TRC as their charity of choice. Subsequently, 1 percent of purchases of Marsh products made using that card will be donated to the program.

The mission of the Teacher's Resource Center, now a division of the Community Learning Network at IUPUI, is to provide educational opportunities to meet the needs of learners, employers, and the community. The CLN serves as the campus's learning agent, delivering education and training at times and places most convenient to learners.

The staff at the Teacher's Resource Center guide teachers in learning about new principles and choosing classroom kits that are appropriate to their curriculum, and they can also arrange for professional development workshops. The center is designed to

be a place where teachers can go to learn and explore different ways of teaching mathematics, science, and technology.

For more information about this and other projects, please visit the Community Learning Network's Web site at [www.cln.iupui.edu](http://www.cln.iupui.edu). Click on Community Outreach for specific information about the Teacher's Resource Center.

Recently, Deb Robertson was nominated for the Women and Hi Tech's 2002 Leading Light Awards. She was named in the Outstanding Science, Technology, or Engineering Educator category and was invited to attend the awards celebration sponsored by the organization on Sept. 20, 2002. Congratulations go to Deb Robertson on this nomination and her many accomplishments.



## Visions become realities

(continued from page 21)

redesigning and maintaining their Web site, [www.angieslist.com](http://www.angieslist.com). Hamblen has also designed a Web site for the fellowship, which can be found at [www.orr-fellowship.org](http://www.orr-fellowship.org).

### Jason Zickler

After graduating from IUPUI with a master of science in media arts and science in December 2000, Jason Zickler formed his own consulting firm, Versomedia Inc. Versomedia ([www.versomedia.com](http://www.versomedia.com)) is an interactive media firm specializing in digital communication

development. The firm has worked on a variety of advertising applications, including online newsletters, CD-ROMs, 3-D animation/digital video, and Web site development, and is involved in corporate identity and branding, human computer interaction, studies, and analyzing user trends in communications.

Zickler recently collaborated with Learfield Sports to produce *The Indiana Basketball Story*, the first in a series of interactive CD-ROMs for McDonald's of Indiana. The CD-ROM contains a widely varied assortment of film, video, graphics, images, and audio, documenting basketball in Indiana from its beginnings.

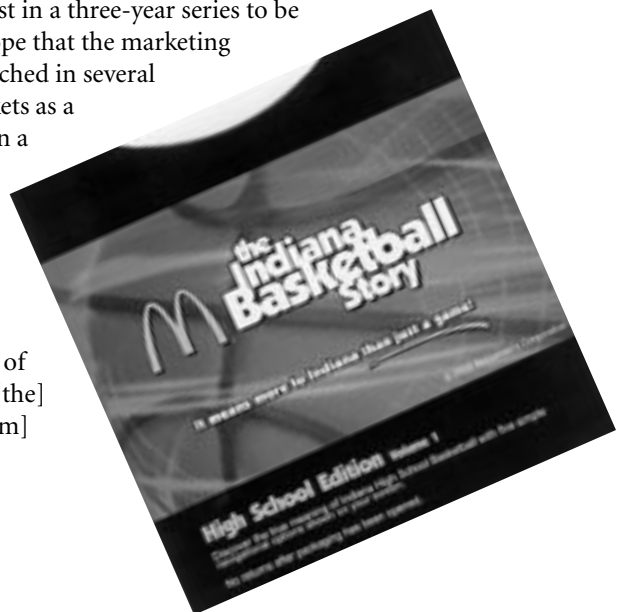
The initial release was in mid-February 2002 and included more than 150 Indiana McDonald's restaurants. It is the first in a three-year series to be released with the hope that the marketing venture will be launched in several other regional markets as a national program. In a note to Darrell Bailey, executive associate dean of the School of Informatics, Zickler stated that this "... is a perfect example of what a graduate of [the] New Media [Program] can accomplish."



Jason Zickler



Michelle Hamblen received a fellowship in May.



# Vision

Informatics studies the application of information technology to the arts, sciences, and professions, and its use in organizations and in society at large. The Indiana University School of Informatics has set as its goal to be nationally recognized as the foremost in the country for excellence and leadership in informatics programs, including undergraduate and graduate education, research, placement, and outreach.

# Mission

We believe there is great need and opportunity for professionals trained in state-of-the-art information technology and science with an emphasis on creative human applications. There is an urgent need in our society for graduates with education and experience in informatics, particularly with interdisciplinary skills. The School of Informatics will be foremost in the country to graduate professionals with formal preparation in information technology with subject area expertise. To this end, we will:

- Lead the nation in the development of an innovative and successful new curriculum for information technology and its applications;
- Educate students, including those who might not traditionally consider an educational path in technology, especially women and minorities;
- Encourage interdisciplinary research projects in the field of Informatics, focusing on distributed systems technology, information theory and information management, human factors and Human Computer Interaction, and study of the social impacts of information technology;
- Serve the state of Indiana by way of education, community participation, and collaborative research partnerships, thereby participating in the growth of an IT culture in the state and encouraging continued economic development;
- Produce graduates who become leaders in the growing information economy of Indiana and the world; and
- Develop synergistic relationships with industry to develop and advance research in information technology and its applications.



## What's new with you?

*Please print in as much of the following information as you wish. Its purpose, in addition to providing us with your class note, is to keep IU's alumni records accurate and up to date.*

Publication carrying this form: School of Informatics Date \_\_\_\_\_

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Preferred name \_\_\_\_\_

Last name at IU \_\_\_\_\_ IU Degree(s)/Yr(s) \_\_\_\_\_

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Mailing address preference:  Home  Business

Spouse name \_\_\_\_\_

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*Please mail to the address above, or fax to (812) 855-8266.*



Tom Stio

# Matthew La Master: Alumni news from 'down under'

*BS in informatics, May 2002*

*Cognate: computer science*

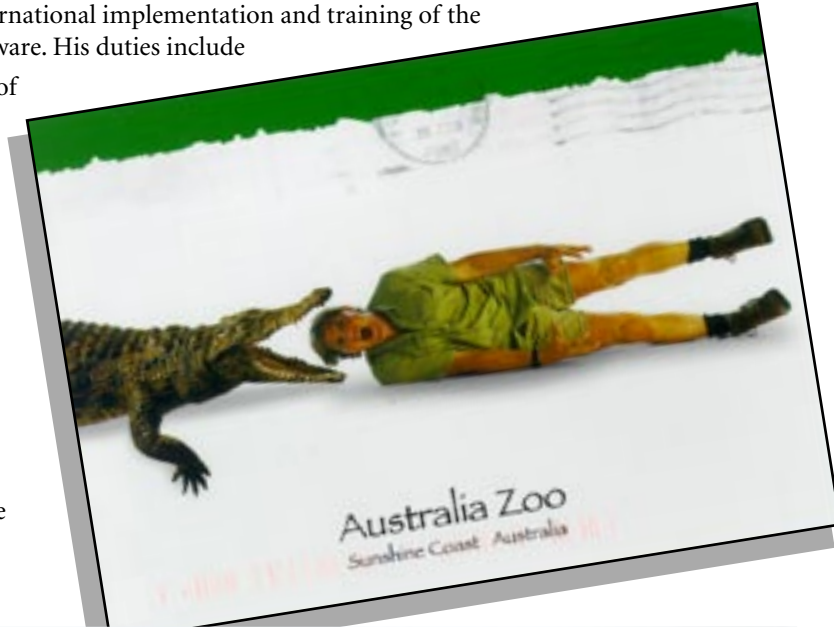
*Founder and past co-president, IU Informatics Club*

A member of Bloomington's first informatics graduating class, **Matt La Master** is now employed as a user services consultant for Pioneer Hi-Bred International Inc. La Master works with the Customer Relations Information Management group to support their international implementation and training of the

Microsoft Great Plains systems software. His duties include

- end-user support standardization of reports throughout the international offices;
- identifying, analyzing, and resolving problems with the application; and
- participating and making recommendations for international training and implementation strategies.

His position will require extensive travel to regional offices in the Asia-Pacific, Africa, and Latin America areas. La Master began his first assignment at the end of May when he traveled to Australia.





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