MIAIMS INFOSPHERE

The MIDAS Touch

An accident victim is brought into the emergency department of a small hospital in rural Missouri. X-rays are critical in determining how the victim is injured, but because of the hospital's small size, a radiologist is not available locally to read the films. The only option in the past may have been to transport the victim to a larger hospital such as the University Hospital and Clinics, an option expensive in both time and money. Thanks to the MIDAS Project, however, the patient may be able to benefit from the services of the Hospital and Clinics' Department of Radiology without having to travel, as University radiologists read his films online.

While that scenario may seem like something from a telecommunications advertisement, in fact it is a possibility now for people served by the Callaway Community Hospital in Fulton, according to Tom McCord, Computer Project Manager with the University Hospital and Clinics Department of Radiology. "A hospital of any size is working on something like this," McCord said. "But we're out ahead of a lot of people."

The system now allows radiologists to scan x-ray films at one location and view them at a remote location on a personal computer with a good 19- to 21-inch monitor. The scans are of diagnostic quality, with a resolution of 2,048 by 2,560 pixels; a 17-inch computer monitor, in comparison, measures 1,024 by 768 pixels.

"It has very good image quality," Dr. Narenda Khengar, nuclear medicine specialist at Ellis Fischel Cancer Center, said, "and very fast transmission."

One immediate benefit of the system is the time it saves on making films available to the radiologists. Khengar said that he would sometimes have to wait for days for film to arrive by courier, but that with the system created by MIDAS, films can be available in a fraction of the time.

The Missouri Image Display and Archiving System (MIDAS) began life early in 1995 when the Department of Radiology, working with Information Services, installed film scanners and view stations at the Hospital and Clinics, Ellis Fischel Cancer Center and Green Meadows Clinics. Additional view stations have been installed in the homes of Dr. Robert Churchill, chair of the Department of Radiology, and two other radiologists. The service has even been expanded to provide radiology consulting services to Callaway Community Hospital in Fulton, and may soon be available in other communities throughout Mid-Missouri. Over a thousand radiology images were sent from Callaway in the first six months of operation.

McCord said that the focus of the project is currently to expand internally at the Hospital and Clinics, but that it is available to rural communities that may not have the need for a full-time radiologist. "It's not something that's being pushed," McCord said. "But it's something that's available if needed."

Liveware

- **Evan Boote, Ph.D.**
- **Rubin Hakimi**
- **Tom McCord**

Evan Boote laughs at the idea that he is in charge of the MIDAS Project in the Hospital and Clinics' Radiology Department. "I prefer to think there's kind of a multi-headed beast in charge of MIDAS," he says, "that includes me but also includes some key people from Information Services."
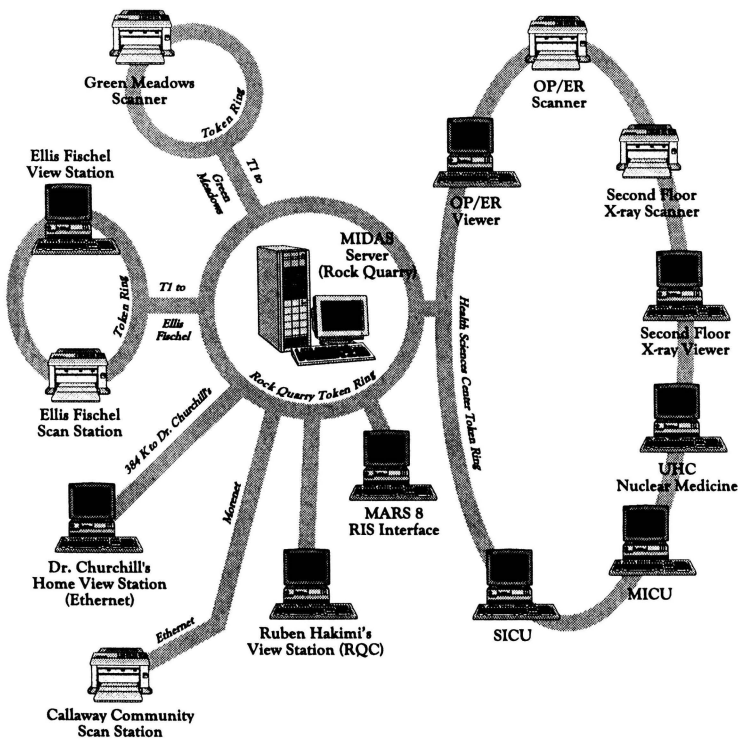
As an assistant professor in Radiology, Dr. Boote heads a variety of clinical services that include, besides MIDAS, radiation safety, image quality control and regulatory aspects of radiographic imaging, in addition to research projects related to radiology. Another important duty is training radiology residents in the physics of medical imaging. Evan earned his doctorate in medical physics from the University of Wisconsin before coming to the University of Missouri Hospital and Clinics in 1988.

Evan says that an important aspect of the MIDAS Project is that it allows the department to take advantage of current personal computer technology to do at a fraction of the cost what a few years ago required high-end dedicated workstations.

"It's a stepping stone to where we're going to be at some point," he

The MIDAS Project Configuration

Green Meadows Scanner

Token Ring

T1 to Green Meadows

OP/ER Scanner

OP/ER Viewer

Second Floor X-ray Scanner

Ellis Fischel View Station

MIDAS Server (Rock Quarry)

Token Ring

T1 to Ellis Fischel

Second Floor X-ray Viewer

Ellis Fischel Scan Station

Rock Quarry Token Ring

Health Science Center Token Ring

UHC Nuclear Medicine

384 K to Dr. Churchill's

MARS 8 RIS Interface

Dr. Churchill's Home View Station (Ethernet)

Internet

MICU

Ethernet

Ruben Hakimi's View Station (RQC)

SICU

Ethernet

Callaway Community Scan Station

The heart of the MIDAS Project is a DICOM 3.0 compliant Picture Archiving and Communication System (PACS) solution from the EMED Company. DICOM (Digital Imaging and Communications in Medicine) is the industry standard for transferral of radiologic images and other medical information between computers. The system consists of three token ring networks, which operate at 16 Mbps, the main network at the University, and the other two at Ellis Fischell Cancer Center and Green Meadows Clinics. The three networks are linked by T1 service (1.544Mbps) using industry-standard routers. The image server, an RS-6000, RISC-based workstation, is based at the University's Rock Quarry Road facility.

Each site is equipped with a 2K by 2K film digitizing scanner. The view stations are Windows-based PCs using 19-inch to 21-inch color monitors.

Liveware

says. "And not a budget-breaking stepping stone."

Ruben Hakimi agrees that MIDAS is a stepping stone in the effort to make medical images more accessible for healthcare providers. "Within five years," he says, "50 to 60 percent of images will be available to view from a doctor's office or nursing station."

Ruben has participated first-hand in the development of digital technology in the field of radiology. After earning his master's degree in applied mathematics in 1971 at MU, he was part of the original team that created MARS— Missouri Automated Radiology System—a system for handling information in the radiology department which is still in use. Today, Ruben is a senior computer programming analyst with Information Services.

The MIDAS Project was the first implementation of a client-server product in the hospital, according to Ruben, and its installation and use have been very successful. Ruben says that before going ahead with the current system, the department looked at some expensive systems such as one created by IBM in partnership with a company named Genesis, which later went bankrupt. If it weren't for the development of MIDAS, Ruben said, "We might have stuck with IBM, and we would have died with IBM."

Tom McCord has the honor of being the person who actually named the MIDAS Project. He says he chose the name to compliment MARS, which had been in use in radiology for years. "I was looking through a book of mythology, and I knew we had 'digital,' and 'archiving system.'" he says. "I just saw 'Midas' and thought we'd be able to crank that out— 'Missouri Image Display and Archiving System. OK, there you are.' And so, we just decided to start calling it MIDAS."

Tom brings more than a talent for acronyms to his job. He was a mathematics instructor at MU for four years after earning his master's degree in mathematics here. A friend suggested he take advantage of an opening for an applications programmer in the radiology department, where he worked under Ruben Hakimi for a number of years. He attended conferences on teleradiology and taught himself what would be needed to make a teleradiology system work.

A major part of the importance of MIDAS according to Tom is the increased service for the department. "The films are mobile, you can get them faster, you can get multiple copies and they shouldn't be lost." Another important component of MIDAS, Tom says, is the ability it gives the University to connect to other hospitals throughout the state. "You can form more partnerships because you've got it."

MIAIMS Progress Notes

The **Policy Committee** met in April. Ralph Caruso discussed his new role as acting Vice Chancellor for Computing. He is working to get a sensible system in place for coordination between all parts of campus. He is led by 2 principles:

- Simplify the technical environment.

- Look at the data network like we do the phone system as a utility and service approach.

Caruso is striving for agreement across the campus and for transparent network services and to manage the data from an enterprise wide perspective.

The **Steering Committee** met in March and May. Tim Patrick, Ph.D., Library and Informational Sciences, presented a demonstration of the Missouri Kidney Program's access to dialysis clinic client information. He highlighted the encryption and security features which will benefit other projects. Andrew Balas, M.D., Ph.D., Health Services Management, provided a timeline for the evaluation of the MIAIMS project. He listed the following three elements: user satisfaction; network access and use; and direct cost of information services.

Dan Longo, ScD, Family and Community Medicine, presented the Clinical Outcomes Measures Report of the Clinical Outcomes, Quality, and Performance Measures Task.

The **Electronic Health Care Record Committee** reviewed the STAR project via a demo by Craig Klimczak, D.V.M., Ph.D., Health Services Managment. The Clinical Outcomes, Quality, and Performance Measures Task Force of this committee presented its report and recommendations. The report identified several needs:

- Need for leadership in the area of clinical outcomes indicators

- Need for physician involvement

- Need to consider reporting issues, especially HEDIS and development of reports that would meet their requirements.

- Need for ongoing effort in this area.

The **Consumer Health Information Committee** is developing a scoring system to evaluate health information web sites.

The **Evaluation Team** is working with the Pilot Project Team to track projects through a database. Team members were given password access to the Web database that houses a list of the MIAIMS accomplishments, pilot projects, and descriptions of both in a hyperlinked format.

The **Web Team** is helping HSC departments/units organize and publish their information on the MIAIMS Web Server. A memo from Weldon Webb, Associate Dean for External Affairs, has asked the units in the School of Medicine and Hospitals & Clinics to publish at least a "top page" of their information on the server to provide a unified view of MU-HSC to the Web user. Using a common server provides the advantage of tracking usage statistics and preventing copyright problems. The Web Team provides this service to all MIAIMS participants—School of Medicine, School of Nursing, College of Veterinary Medicine, Hospitals & Clinics, and the Health Sciences Library.

MIAIMS Pilot Projects

The Pilot Projects focus on the development of "Integrated Advanced Information Management Systems" in accordance with the four priorities outlined in the MIAIMS Strategic Plan: (http://www.hsc.missouri.edu/miaims/strategy/mainscr.html). The following projects are in development:

Area Health Education Center (AHEC) Student Workstation–A computer-based system that allows students in rural practice to use a Web interface to improve the quality of the educational experience and access information resources at the Health Sciences Center.

Community Practice Network–A Web interface with tools to access patient care information, collegial communication, and professional literature.

Configurable Workstation–An enterprise wide single sign-on access to information sources and systems based on user needs.

ECG Reporting System -An Electrocardiographic (ECG) database using WWW technology.

Electronic Document Delivery–A system by which the Health Sciences Library can transmit images of documents via the Internet.

Health Sciences Librarian Distance Education–A Web based course on health sciences librarianship offered by the School of Library and Informational Science.

Image Database–A repository of digitized 35mm film and radiographs for use in the curriculum.

Integration of Department Libraries–A system that makes UMC department collections of digital and/or non digital information World Wide Web accessible and searchable using standard methods.

Lab Data Delivery–A system to test the feasibility of delivering recently completed laboratory data to clinicians via the Web.

Missouri Kidney Program Cost Containment–An Internet or WWW information network providing MoKP treatment facility staff direct access to the MoKP patient database.

OA-Rehab–A computer program that provides information to individuals about medications, assistive devices, and exercise programs.

STAR (System for Text Archive and Retrieval)–A mechanism that provides location independent access to clinical reports using the Web.

MIAIMS Expands HTML Training
Advanced Classes and Workshops Offered

HTML Classes will be offered on a variety of topics throughout the summer. If you're interested in creating your own Web pages but don't know how to begin, attend our Beginning HTML class. Once you've mastered the basics, you may be ready to move on to our more advanced topics, such as Web Page Design, which will cover how to create tables, frames and more, or CGI and Forms, which deals with creating your own interactive forms on the Web. Each class is one hour, and provides a packet of free materials to help you create your Web site.

Also offered are HTML Workshops, in which you can work on either your own projects or practice projects and receive one-on-one instruction. Each Workshop attendee will be seated at a computer with browsing and mark-up software.

Take the classes and workshops together or independently. Take as many classes or come to as many workshops as you like. Both classes and workshops are free, but attendance is limited to eight, so reserve your seat. now.

When

Every other Wednesday throughout the summer, beginning June 5.

Reservations

Seating is limited to eight. For reservations or information, e-mail to Lucia D'Agostino (miglucia@muccmail.missouri.edu) or Sarah Blanton (migsarah@muccmail.missouri.edu) or call the MIAIMS office at 884-6627.

Cost

There is no charge for either the classes or the workshops.

Who May Attend?

Any Health Science Center faculty, staff member or student who wants or needs to learn how to prepare documents for the World Wide Web.

Classes

July 3:	Beginning HTML
July 17:	CGI and Forms
July 31:	Beginning HTML
August 14:	Web Page Design
August 28:	Beginning HTML

Time: 9:00-10:00 AM

Place: HSL 126 Computer Lab.

Workshops

The workshops are an opportunity for you to bring your Web pages or issues and receive individual tutoring. Topics can range from learning how to create hyperlinks to creating Forms and CGI scripts. Each attendee will be seated at a computer with access to the Web and the software required for browsing and marking up documents.

Date: Workshops are held every other Wednesday from June 5 to August 28

Time: 10:00-12:00 Noon

Place: HSL 126 (Student Lab on bottom f l o o r of Health Sciences Library)

Prerequisite: Beginning HTML class or equivalent experience; i.e. familiarity with the Web, hyperlinks, and HTML.

NOTE: Please bring an IBM formatted diskette with you to save your work on. Bring any documents you want to work on in electronic format, saved as .htm or .txt.

See also the announcment at URL: http://www.hsc.missouri.edu/main_ndx/announce/html.html. Any changes to the schedule will be announced here.
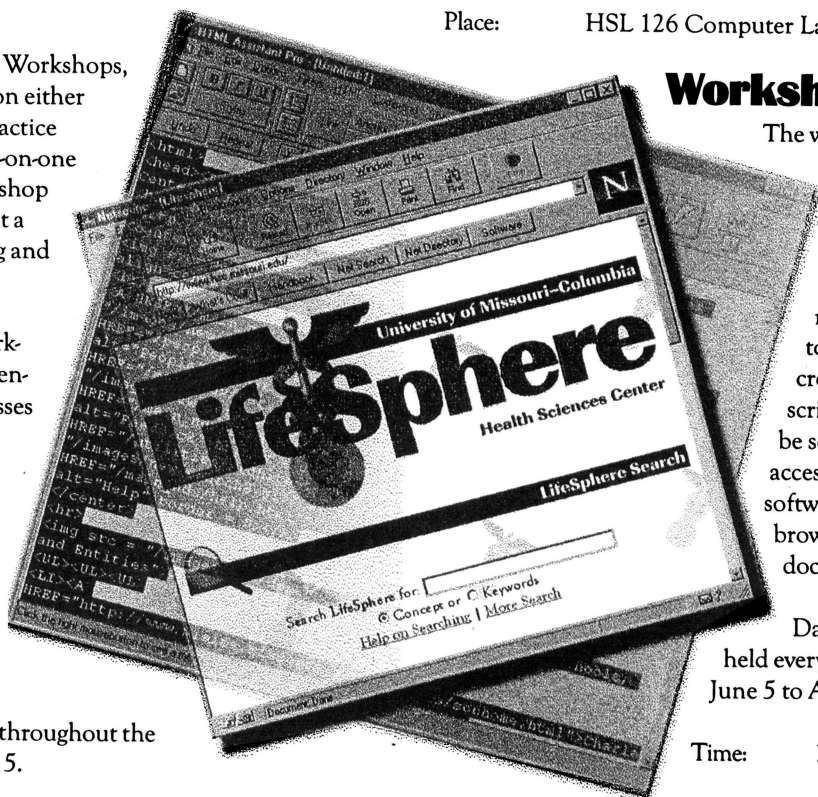
Notes from the J. Otto Lottes Health Sciences Library

For more information about the following, call Health Sciences Library Information Services at **882-6141**, or access the Library's Web page at http://www.hsc.missouri.edu/library/docs/library.html

Mediated Searching—Beyond MEDLINE

Whether pressed for time or in need of specific information unavailable from MEDLINE, keep in mind that the Information Services Department at the J. Otto Lottes Health Sciences Library offers mediated searching of over 100 databases in addition to those on HSLNET. In this day of easy access to information, it is tempting to overlook the hundreds of databases available in favor of the familiar ones at hand. A few examples of health related databases are:

ETOH, the Alcohol and Alcohol Problems Science Database put out by the US National Institute on Alcohol Abuse and Alcoholism (NIAAA), contains citations with abstracts of worldwide literature on alcoholism research in psychology, psychiatry, physiology, biochemistry, epidemiology, sociology, animal studies, treatment and prevention, and education. Covering 1972 to the present, it includes journal articles, books, conference proceedings and dissertations.

CAB Abstracts, by C.A.B. International, covers international literature in fields such as veterinary medicine; animal husbandry, nutrition and breeding; animal health; dairy science and technology; rural development and sociology; parasitology; and; human nutrition. It includes journals and books from 1972 to the present.

Chemical Abstracts (CA File), produced by the Chemical Abstracts Service, covers the worldwide field of chemistry including the following subjects: chemistry and chemical engineering; applied chemistry; biochemistry; macromolecular chemistry; organic chemistry; physical, inorganic and analytical chemistry. Covering 1967 to the present, it includes journal articles, books, conference proceedings, technical reports, dissertations, and patents. The library is able to offer an 80% discount on searches through the CAS Online Academic discount Program.

Health Devices Alerts, by ECRI, contains information on reported medical device problems, recalls, hazards, technology assessments, evaluations and updates. Diagnostic and therapeutic medical equipment, radiological equipments, implanted devices and related accessories, disposable medical products, clinical laboratory reagents, hospital furniture, and sutures, among other items are covered. Reports are from ECRI and the U.S. Food and Drug Administration and cover 1977 to the present.

Some additional databases include:

Ageline
Forensic Science Database
AIDSLINE
HAPI (Health and Psychological Instruments)
AIDSDRUGS
SciSearch (citation searching)
AIDSTRIALS
Social Scisearch
BIOETHICS
Sport Embase
Toxline

While the price of a search on an HSLNET database is $6.00 with additional databases being $2.00 each, the costs for searching non-HSLNET databases varies per database. For information or to request a search call the Information Services Department at 882-6141 or view our homepage at http://www.miaims.missouri.edu/library/ and go to "Online Search" listed under "Request Library Services."

InfoTours

Medical Informatics Group
Monday Noon Seminars
Sinclair School of Nursing, Room S226

July 1   Distributed Virtual Reality Simulation
Michael Prewitt, Ph.D.
Director, Respiratory Therapy

July 8   Cost Analysis in Health Care
Lanis Hicks, Ph.D.
Associate Professor, Health Services
Management

July 15   The MIAIMS Project
Joyce A. Mitchell, Ph.D.
Associate Dean

July 23   Sensitivity Analysis for Modeling and Decision
Making Using Neural Networks
Victor Vargas
Mechanical and Aerospace Engineering

July 29   A Web-Based Journal
Dale R. Musser, Ph.D.
Assistant Professor of Education

MEDLINE, CINAHL and PSYCINFO
The OVID system makes available both DOS and Windows versions for searching journal literature in PsycINFO, MEDLINE and CINAHL. These workshops focus on the Windows version; DOS instruction is available on request. Enrollment is limited to 8 people for each workshop. Classes may be scheduled for individuals or departmental groups for dates other than those listed. All workshops will be held in HSL 126. To reserve a place in any of the classes, call 882-6141, or register on the Health Sciences Library's home page on the World Wide Web; the URL is http://www.miaims.missouri.edu/library/docs/wsreg.html.

MEDLINE
July 10   3:30 - 5:00 pm   August 20   10:00 - 11:30 am

CINAHL (Nursing and Allied Health Database)
July 16   3:30 - 5:00 pm   August 22   10:00 - 11:30 am

PsychINFO
July 23   3:30 - 5:00 pm   August 27   10:00 - 11:30 am

HTML Classes
HyperText Markup Language classes are held every other Wednesday beginning June 3. See the article on page 4 for more information. Call 884-6627 to enroll.

Boyd, Trenton
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