Taking a Second Look

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In an environment as diverse as a major research university, what do the associate dean of medicine, a film professor, the head of the library's special collection, the university president, an emeritus professor of education and an undergraduate social work major have in common?

They all congregate at Second Look Computing to develop computer-based multimedia for instruction, research or presentation. The head-turning level of multimedia integration on the University of Iowa campus resulted from a concerted effort to provide access, expertise, commitment and last, but certainly not least, enthusiasm.

What is Second Look?
Second Look Computing, part of the Weeg Computing Center, the University of Iowa's center for academic computing, began computer-based multimedia development in 1978 with one of the first interactive videodisc projects in the world. Since then it has continued its goal of research, development and training in multimedia computing.

The name "Second Look" reflects our approach toward computing: that what we're doing is worth taking a second look at—it's new, exciting, creative and useful. Our primary goal is to give students, faculty and staff the access, ability and confidence to use multimedia tools and new technologies in teaching and learning. Some projects are large scale; many more are day-to-day responses to student needs, substituting dynamic media for traditional lectures and print handouts.

Boosting Awareness, Expertise
Despite the widespread media attention that multimedia computing has been accorded, it's often difficult to initiate those first steps that lead to comfort and skill. We've implemented a five-prong strategy to raise awareness and increase expertise among administrators, faculty, students and staff. These include short courses, seminars, circuit riding, hand holding and committee support.

We offer over 20 short courses, which are taught each month in two-hour blocks. These courses typically change from semester to semester to keep up with new products and currently include:

Media Acquisition / Creation
- Introduction to image scanning
- Advanced scanning: Tips and tricks
- Intro to digital audio: Sound Edit Pro
- Advanced digital audio: AudioMedia
- Capturing video: VideoVision and Premiere
- Introduction to 3D: Alias Sketch

Media Manipulation
- Photoshop, Part 1
- Photoshop, Part 2
- Digital video editing on Mac: Premiere
- Video special effects: COSA After Effects

Media Integration
- Introduction to Aldus Persuasion
- Introduction to Passport Producer Pro
- Introduction to Macromedia Director
- Advanced Macromedia Director
- Introduction to interText
- Introduction to Apple Media Tool
- Introduction to Macromedia Authorware Professional
- Introduction to HyperTalk

New Technologies
- Introduction to Apple Newton
- Intro to CD-ROM mastering services

We are considering offering a Second Look certificate in multimedia development, which would be earned by not only taking the short courses, but by demonstrating competency in each. Would this certificate yield academic credit? No. Would it provide real-world source credibility? Yes.

Our students and staff are widely sought after—and occasionally raided—based on our reputation. We believe it would be a service to...
Getting media into the computer in a usable form requires a fairly sophisticated set of tools.

our community to provide a more responsive means of training than can be accommodated by traditional academic course restructuring.

Given their frequency, short courses offer just-in-time training. Once interested in a process or product, or to help determine interests and needs, one can pinpoint his or her needs by attending a short course. But the 20 short courses are taught over an entire month. Even if motivated by a need to get a project done, few people can take the time to attend all of them. How then, can we increase awareness more efficiently?

Our answer has been a four-year series of one-day seminars on multimedia computing. Each seminar presents technology overviews as well as insights into current projects under development and are highlighted by special presentations from vendors. They assume a festival flavor; their purpose is to inform and inspire rather than to teach, and the 85-person auditorium sells out immediately. Many attendees return year after year, yet the seminars also serve those new on campus.

Interests often arise at a departmental, as well as an individual, level. Captivated by the desire to create, we needed an efficient means of training several people within a department or group. To accomplish this, we’ve taken a circuit-rider approach. We go to the department and provide intensive teaching to a number of people; for example, this fall we offered a one-week course for the Department of English where six multimedia projects are underway. Not only is this more efficient than having a dozen people attend our short courses, but often participants feel more comfortable learning with their peers. Furthermore, departments tend to have unique needs and insights that are nicely addressed in the informal courses on their own turf.

Having been introduced through short courses, seminars or circuit riding, once faculty, students or staff are into project development, they come to Second Look to use the hardware and software resources available. As they move beyond introductory use of software, they receive focused problem solving through a certain level of hand-holding by our staff. In addition to full-time staff, several part-time members are always on duty to circulate among users and circumvent any problems they may be having.

Finally, but equally importantly, we raise awareness and expertise by serving on many university committees. For example, our staff currently provides support for the University Library’s Information Arcade, a new million-dollar electronic scholarship center as well as the College of Medicine’s planning committee for their new computer-based education facility. This activity furthers our goal of establishing satellite multimedia development locations across the campus.

Sources of Support

Second Look does not charge for its services, not even for mastering CD-ROMs. We have been fortunate to have enthusiastic support from the administration of the Weeg Computing Center, in line with Weeg’s historical commitment to academic computing.

Recently we received a two-year, $400,000 grant from the Roy J. Carver Charitable Trust in Muscatine, Iowa, which not only dramatically expanded our hardware and software base, but provided three staff members to create instructional medical software. These members are designated to be hired by the College of Medicine when the grant ends, providing a highly experienced staff in that satellite facility.

As more departments become active, they have succeeded in acquiring development grants in the $5,000 to $5,000 range, which helps support additional staff as needed. Finally, we received a $27,000 grant from the university’s student computing fees to support CD-ROM mastering.

Development Team Make-up

Staff versatility is essential to our clients’ success. Our professional staff of six includes people with expertise in instructional design, video, audio, graphics and software engineering. Undergraduate and graduate students, as well as student interns, are also invaluable. The combination of full-time and student staff provides continuity and infuses new skills and perspectives. Typically a subset of our staff is assigned to a project, but more often than not, every member contributes to every project because of constant inter-staff sharing and evaluation.

The final key ingredient to a development team is the faculty or staff member with content expertise. We have been impressed with the amount of time that many of our faculty members have contributed to their projects. For example, Brenda Farrell, Anthropology, has devoted approximately 25 hours per week for the past seven months completing a CD-ROM companion for her book Do You See
What I Mean, a book on Plains Indians sign talk and the embodiment of action. Next semester, Dr. Ronald Lauer, Department Chair in Pediatric Cardiology, is devoting a majority of his time to learn more about multimedia development to extend the CD-ROM courseware we are developing with him.

What We’re Capable of Doing and Why We Can Do It

You can’t have multimedia without media; and getting media into the computer in a usable form requires a fairly sophisticated set of hardware and software tools. At Second Look, we’ve worked long and hard to put together multimedia workstations that empower users to tackle the tough job of media collection, media creation, media editing and media integration. We give faculty and staff members access to Macintosh computers and other multimedia hardware, including 1/2”, 3/4”, and Hi8 VCRs; videodisc players; video digitizers; flatbed and slide scanners; audio digitizers; analog and digital audio decks; and a CD-ROM mastering station.

Mary Flanagan, Second Look video consultant, works with Bob Boynton, professor of political science, to create digital movies of political ads.

1. Image Scanning and Editing — Most multimedia projects rely heavily on still images, either original images created specifically for the project or repurposed from an existing library of slides or photographs. That’s why we’ve put into place two high-quality slide scanners and two excellent flatbed scanners. In addition, one of the flatbed scanners, our Agfa Arcus, is equipped with a transparency option to let us scan large-format photographic negatives, microfilm and microfiches, and even 35mm motion picture film!

We’ve found over the years that it’s best not to try to economize when it comes to scanners; good education materials require high-quality images. Our first slide scanner was a relatively inexpensive model and a breeze to use, but the resulting images were never crisp and sharp. In addition, the scanning process introduced a lot of strange color artifacts into the image. As educators, we really can’t afford bad image quality.

For example, the most important media in an interactive pediatric cardiology textbook we’re working on with Dr. Lauer are the diagnostic components. We need to present the user with the highest quality representation of diagnostic materials, such as X-rays, angiograms, sonograms and pathology specimens. Making sure that these materials are reproduced on the computer screen with the highest quality possible is literally a matter of life and death; any potential inaccuracies introduced by the scanning process could confuse the user, causing him or her to misdiagnose a case in the real world. In addition to having high-quality scanners, two pieces of software have really helped make our life easier when it comes to scanning and retouching images; LightsSource’s OFOTO and Adobe Photoshop.

OFOTO is a dedicated scanning package that takes a lot of the hard work out of scanning. It will automatically straighten your image in case you accidentally put it on the scanner crooked. It will automatically adjust the brightness and contrast to an optimal level. It will automatically optimize the color of images for your targeted delivery platform. It also does a great job of minimizing “moire patterns,” those swirling patterned artifacts you get when you scan previously half-toned images. And of course, you can override any of these automatic functions.
Adobe Photoshop is a sophisticated image-editing package that can also help you create original artwork and interface elements. Photoshop is an extremely useful tool for cleaning up scanned images from less-than-stellar-quality originals. For example, in The Rebecca Project, an interactive encyclopedia dealing with Alfred Hitchcock’s film “Rebecca,” Professor Lauren Rabinovitz wanted to include a section on how the film was advertised in six cities during its original release. Movie ads tell us how we ought to watch a film, what kind of movie it is, and what we should expect when we enter the theater. Lauren felt that access to these ads was essential for students to understand how original audiences viewed Rebecca. While the professor had to use badly worn and scratched microfilms of the newspapers as her source, she was, however, able to use Photoshop to restore the ads to a legible and educationally viable quality by retouching and removing the scratches and flaws.

2. Video Digitizing— The two things that have made the recent explosion in educational multimedia possible are Apple’s QuickTime and cheap double-speed CD-ROM drives. QuickTime makes it pretty easy to include motion video in educational multimedia projects, and the existence of inexpensive CD-ROM drives lets one deliver these video-laden projects to users. With QuickTime software and a CD-ROM drive, you can deliver video on a Macintosh Color Classic and above-class computer without additional peripherals. Users don’t need a videodisc player or a TV monitor; the video plays right on the computer screen, right off the CD-ROM.

Getting high-quality video into the computer can be painful if you don’t have the right tools. Right now we’re using the Radius VideoVision Studio, a QuickTime digitizing board that combines excellent image capture with JPEG-based hardware video compression and decompression. VideoVision Studio is capable of recording full screen, 640-by-480-resolution QuickTime movies to a hard drive at 30 frames per second.

Before we got our VideoVision Studio, we used an inexpensive QuickTime capture board with some pretty bad results: movies that didn’t hold sync between video and audio, and movies with pretty marginal video quality.

We seldom actually use the VideoVision Studio to capture full-screen video; normally we’ll capture in either at 320 by 240 or 480 by 280, depending on the size of the video window we’re going to deliver in the finished multimedia product. But the VideoVision Studio’s hardware compression and decompression guarantees that we capture all the video information we need. We can then recompress the video with one of the QuickTime software-only compressors so that our movies can play back on any color-capable Macintosh.

The VideoVision Studio also offers our users high-quality, flicker-free NTSC output, or “print to videotape” capability for computer-based materials. They can easily make a videotape of their presentations or animations for playback on any VCR.

3. Audio Digitizing and Editing— Sound is often the most overlooked component in educational multimedia. That’s too bad because sound can powerfully affect the user. Music and sound effects can evoke mood and dictate
how a user interprets your material; well-designed interface sounds (button clicks, warning sounds, etc.) can go a long way towards making a multimedia production easy to navigate.

We’re currently using Digidesign’s Audio-Card II and the sound inputs of our Macintosh 840AV to digitize production-quality audio. Both of these solutions offer CD-quality audio, 16-bit resolution and a 44.1 Khz sampling rate. While we deliver most of our audio currently at 8-bit, 22Khz (the Macintosh audio standard before the CD-quality AV machines), the higher quality digitizing allows us more flexibility when it comes to editing and archiving for future revisions. We use Digidesign’s Sound Designer II, osc’s Deck II and Macromedia’s SoundEdit to manipulate, mix and edit the sound.

4. 3D Modeling— There is more and more interest in 3D modeling and animation as a powerful way of visualizing processes that can’t be easily observed or of places that no longer or never did exist. We support a number of 3D packages on the Mac, including Alias Sketch!, a very capable spline-based modeler and Virtus WalkThrough, an architectural 3D package.

A student working with a faculty member from the English department recently used Virtus WalkThrough to accurately recreate England’s Globe Theater. The finished product isn’t just a static animation: the user can actually tour the Globe at his or her own pace, moving through the imaginary space in any direction he or she chooses.

We’re helping Dr. Rex Montgomery with an interactive teaching tool for covering advanced topics in biochemistry. This project, as well as Dr. Lauer’s pediatric cardiology project, rely heavily on 3D visualization as a teaching tool. Chemical reactions are hard to directly observe, and it is hard for students to understand exactly what is happening to a child with a ventricular septal defect. In these projects, we’re using a Silicon Graphics computer, the Indigo Elan, to generate complex 3D animations that we’ll deliver on the Mac as QuickTime movies.

What People Are Actually Doing

interText. In addition to creating interactive multimedia projects for end users, a significant portion of Second Look’s time and energy is devoted toward creating development tools that can be used on campus and elsewhere to produce new multimedia products. Second Look is dedicated to making multimedia resources accessible to faculty, staff and students regardless of their expertise, and toward that end, has developed a tool, now available commercially, called interText. Written in HyperCard, interText allows novice and experienced users to create BookStacks, electronic books annotated with words, images, sounds, movies and hypermedia links to other text. interText is currently being distributed by Intelimation.

Governor’s Presentation. This presentation was developed by Second Look for University President Hunter Rawlings’ annual budget meeting with Iowa Governor Branstad. Faced with the challenge of accurately representing the concerns of the faculty and students, Rawlings sought a way to “bring the university to the governor.” Second Look responded by creating a multimedia presentation, complete with text, charts, scanned images and video-taped interviews with students and faculty.

Wiyuta: Assiniboine Storytelling with Signs. The Native American Assiniboine are one of the only people whose spoken language combines words and hand signals, and Brenda Farrell (Anthropology) is currently working with Second Look to develop an interactive CD-ROM to accompany her book on this language. Centered on the telling of three folk tales, the multimedia project combines QuickTime movies of the storytellers with sound, music, written words in Nakota and translated into English, plus “labanotation,” a written form of the body movements. The book and accompanying CD-ROM will soon be published by University of Texas Press.

The Rebecca Project. Developed under the direction of Lauren Rabinovitz (Communication Studies and American Studies Program), this multimedia project is an interactive encyclopedia about the Hitchcock movie, “Rebecca.” It incorporates QuickTime movie clips from the film, as well as critical analyses and primary materials, such as scanned images from the original advertising campaign. Presented in an interactive environment, the project allows students to study the film from a variety of perspectives, focusing on production techniques and screenplay adaptation, as well as critical and historical issues. The Rebecca Project was funded with university support through a computer-based education grant, and will be published soon by Rutgers University Press.
Find Out About 4-H. Janet Martin, from the Johnson County Extension Service, has worked with Second Look to develop a multimedia project to teach children about the 4-H club. Funded by community support through a grant from Hills Bank and Trust Co., the interactive program contains information about the history of 4-H, types of 4-H projects and a directory of state extension service offices. It's been used at the Johnson County Fair and the Iowa State Fair, as well as at a number of elementary schools throughout the state. Part of the project includes actual images from the fair—movies of fairgoers, images of farm animals and a photo gallery of 4-H projects.

Hyperkarte. Using Second Look as a resource, Marc Armstrong (Geography) has received federal funding through a grant from the National Science Foundation to develop a prototype instructional program to teach students cartography theory. Designed as a supplement to introductory cartography courses, the software includes a large database of maps collected from the university's map library, government publications and Marc's personal collection. This database then provides a source of maps to present principles of cartography theory with examples of good and bad map design.

How May We Help You? Several years ago, Second Look, then the CAI Lab, worked closely with the University of Iowa Hospitals and Clinics to develop an interactive kiosk for patients and visitors of the UIHC. With the advent of QuickTime movies and low-cost hardware, the technology became readily available to update the information in these kiosks quickly and easily, as well as to develop kiosks that were more responsive to the needs and interests of patients in the individual clinics. As a result, Second Look is developing a series of new kiosks with the assistance of Ron Lauer (UIHC Information Systems). Our first kiosk was completed with the assistance of Pat Connolly (Otolaryngology Clinic) and is currently installed in the Oto Clinic's waiting room. A Neurology kiosk, undertaken with the help of Mary Hensley, is underway.

Cardiac Rhythm Analysis and Interpretation. Faced with a desire to teach students more effectively how to analyze and interpret single-lead EKGs, Renee Crisman (Nursing) is working with Second Look to develop a computer-assisted instructional program on this topic. Set in an interactive learning environ-

ment, students are presented with an EKG strip and provided with detailed instructions and opportunities for guided practice in analyzing and interpreting the script. Making use of the technology, students are allowed to work at their own pace, shown assistance when required, and provided with instant feedback for their responses. The project has received university funding through a computer-based education grant.

BarKeeper. Another development tool in creation at Second Look is a family of applications for creating and managing barcodes for use in a multimedia project. Realizing that a computer will never replace the user-friendliness of the printed word, multimedia developers have struggled with trying to integrate printed text with video and audio elements. Still in development, BarKeeper is a simple but powerful program that meets this demand. An author can easily add barcodes in the margins of a printed document, and a user simply swipes the barcode with a hand-held reader to display an image, play a sound or show a movie.

Pediatric Cardiology. With funding from the Carver Computing Initiative, Second Look is developing an interactive computer-based instructional program on heart defects in babies under the direction of Ron Lauer (Pediatrics). The program is designed to teach medical students as well as pediatric residents and fellows about ventricular septal defects using archival sonograms, angiograms and pathological specimens. Part of the program presents two case studies and allows a student the opportunity to make decisions in a realistic simulation.

The Biochemistry Project. Also funded by the Carver Computing Initiative is an interactive program for teaching biochemistry students about biochemical reactions. Led by Rex Montgomery (Biochemistry), the program consists of 2D and 3D animations of biochemical reactions where one or more molecules dock into an enzyme, parts of the molecules interact with parts of the enzyme, and then one or more molecules leave. These animations are then incorporated into case studies with which the students interact.
and students alike—as both creators and active participants in an education that is of their own making.

As Professor Brooks Landon, Department of English, says, “Students have to do more real scholarship, more significant research to put together a multimedia program than they ever had to do for a traditional term paper, and what’s to complain about that? I can’t think about going back!”

For more information on their experiences, the authors invite readers to contact them by phone or leave them e-mail messages.

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Products mentioned:
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Alias Sketch; Alias Research, Inc., Toronto, Ontario, Canada
Apple Media Tool; Apple Computer, Inc., Cupertino, Calif.
Audiomedia II, Sound Designer II; Digidesign, Inc., Menlo Park, Calif.
COSA After Effects; The Company of Science & Art (COSA), Providence, R.I.
Deck II; osc, San Francisco, Calif.
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OFOTO; LightSource, Inc., Larkspur, Calif.
Passport Producer Pro, SoundEdit Pro, Macromedia Director, Authorware Professional; Macromedia, San Francisco, Calif.
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Virtus WalkThrough; Virtus Corp., Cary, N.C.