NYU in Florence:
La Pietra Gets Wired

The Debut of Global U
Where Are New York's Community Networks?
The Margaret Sanger Papers Project

Connect
Academic Computing and Networking at NYU
Spring 1998
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Editor's Note: After putting out two issues as editor pro tem., Melissa Whitney has returned to her regular duties at ACF. Melissa edited this publication with excellence, style and wit, and we are lucky to still have her as a contributing writer.

I am honored and excited to step into her shoes with this, my first issue as editor of Connect. Inside, we have taken a close look at NYU's Intranet services, with a review of class websites (p. 5), a primer on accounts (p. 17), and an introduction to Global U, a new website for international activity at NYU (p. 9). We also bring news of NYU-NET's improved and expanded reach, with the installation of new high-speed modems (p. 24) and the connection of NYU's Villa La Pietra in Florence (p. 7). If you're not sure of the distinction between the Internet and NYU's Intranet, check out the HelpLine Q&A on page 18.

ACF mourns the death of Ed Friedman, Associate Director for Scientific Computing and Visualization. He was a valued colleague and friend, and we are grateful for the example of scholarship and gentility he set for us.

Have a great trip, Ed.

—Joan Charlotte Matelli

Connect: Academic Computing and Networking at NYU is edited and published by New York University's Academic Computing Facility (ACF). Its scope includes information about computing and networking activities at NYU's various schools, departments and administrative units, and outside developments of interest to the NYU community.

Copies of Connect are available at the ACF Innovation Center, the ACF computer labs, the NYU Information Center and most graduate school offices. Copies are mailed to full-time university faculty, staff and researchers, based on mailing lists administered by Personnel. If you are a full-time faculty member and do not receive a copy, please notify your dean's office; full-time staff should notify their personnel representative. If you are not among these groups but would like a free subscription, send e-mail to acf.connect@nyu.edu.

You can also read Connect online, through NYU Web, at the URL www.nyu.edu/acf/pubs/connect/.

We welcome your comments about the articles in this issue, as well as suggestions for future issues. Contributions are invited for consideration by the editor.

Opinions expressed in the articles in this publication are those of the authors and not necessarily those of Academic Computing Facility or of New York University.
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Ed Friedman, Associate Director of the Scientific Computing and Visualization Group at NYU's Academic Computing Facility, died suddenly on November 15, 1997, while en route to a conference in California.

Ed joined ACF's predecessor organization, the Courant Mathematics and Computing Laboratory, in 1971. He was responsible for creating a project to provide support for mathematicians and scientists. For years — more recently in collaboration with Dr. Frances Bauer — he worked to build a skilled staff who can understand the needs of many disciplines and provide them with technical support. One of Ed’s bedrock principles was that his clientele should focus on their research, while he and his group would tend to the mechanics of computing. Ed himself was able to speak the languages of both his staff and his clients.

Ed Friedman was recognized and appreciated throughout the university. Before ACF created an Arts Technology Group, Ed observed that scientific visualization techniques could be applied in the arts as well as in science. He assisted many people in NYU's Tisch School of the Arts, providing guidance, encouragement and expertise to artists who were beginning to explore the world of technology. Throughout his life, Ed personally maintained that supportive role in his relationships with artists.

In addition to his role as Associate Director, Ed Friedman was a tireless champion of graduate students. He recognized that they are the scholars and researchers of the future, and that as such, they need support as much as any established science program does. In many regards, it seemed that when research goals were involved, Ed’s motivation was always to find a way to say “yes” rather than “no.”

Ed was always ready to join in a discussion on any topic. Admired for his depth and breadth of knowledge, he could offer useful insights in virtually any field, be it politics, history, religion, literature, visual art, or the relationships among them. In many ways, Ed represented academia at its finest. Until the day he died, he retained an open mind, an insatiable curiosity, a willingness to reconsider his stance when engaged in a discussion, and an intellectual rigor deeply respected by his colleagues.

We at NYU have lost a valuable friend and colleague. Those of us who knew Ed, and who have struggled to make sense of his loss, are attempting — as Ed himself would have done — to derive a lesson from the way he lived. Many of us feel that one of the best ways to remember Ed Friedman is to follow the examples he set, respect the principles he respected, and remind ourselves of the gentle leader and visionary he was, every day of his life.

Edi Franceschini has assumed the role of acting manager of ACF’s Scientific Computing and Visualization Group.

Both Ed Friedman and Frances Bauer are to be commended for building a valuable support group for scientific computing and visualization activities over the past 25 years. Although we mourn Ed’s departure, at the same time we affirm our intention to maintain and extend the creative and effective support for these activities that he nurtured over his many years at ACF.

— George Sadowsky
The role of information technology as an aid to instruction is receiving increased attention within the higher education community. A variety of factors contribute to this surge in interest.

Some hope that the costs of delivering instruction can be reduced. Others believe that the quality of education can be enhanced, while still others see computer- and network-based instruction as a way to increase the application of a collection of techniques often described as "distance learning."

Whatever the reason for thinking about the topic, it is a highly visible one within the higher education community.

Two recent news reports highlight the ambivalence within higher education to the use of this technology. UCLA has established a policy of providing a web page for every undergraduate course in its College of Science and Letters. As reported by the Chronicle of Higher Education:

> The promise amounts to a revolution in the way the university views the Internet. Instead of supporting a few professors who want to put class materials on the Web, UCLA is creating an infrastructure to put information about some 3,000 courses online. It's a change that requires hiring 60 to 80 technology consultants, most of them students, to construct Web pages and teach professors how to use them. It also requires the sharp expansion of existing campus computer laboratories — adding at least 200 new computers and upgrading many old ones. And it means charging students a new "materials fee" of $10 per humanities course and $14 per science course.

At York University in Toronto, the use of information technology in the classroom was a significant issue requiring resolution to end a recent strike by the faculty union. According to the Chronicle, the new contract states that decisions to use technology for enhancing classroom sessions, or for delivering courses to remote locations using video conferencing, "shall be consistent with the pedagogic and academic judgments and principles of the faculty member employee as to the appropriateness of the use of technology ... " The new contract also states: "Normally, a faculty member will not be required to convert a course without his or her agreement."

The position of the York faculty union was not based upon any requirement to use technology, and indeed the administration stated that it had no intention of forcing faculty members to use the technology. Nevertheless, the faculty seemed concerned that the cost-cutting potential of the new technology could amplify the administration's fascination with it, leading to pressure to use the technology in a manner inconsistent with the faculty members' individual instructional styles. A person at York specified the UCLA policy mentioned above as a reason for faculty to "take a fresh look at their contracts."

On the surface, these two incidents are not contradictory. One can regard UCLA's use of web pages in part as replicating printed information about the University's selection of courses within an electronic medium. There are some obvious advan-
tages to this, including the marketing advantage of being able to provide instantaneous worldwide delivery of information about courses at little or no additional cost, as well as creating a complete information space for internal use by students.

In the longer term, the intent is surely to provide support for professors, moving toward exploiting the electronic space for new and improved forms of delivering instruction. As the massive shift of content to the Web continues, the opportunity to interweave course materials appropriately with external resources can only increase, providing gains for both conventional and non-conventional methods of teaching. The York faculty union, however, seems to fear that this trend will result in a loss of both jobs and autonomy in the classroom.

At the heart of the debate is the perennial question of the extent to which instruction can be delivered effectively in a pre-packaged form, as a commodity, across potentially large distances. The traditional western model of education is, at the least, skeptical of this view, stressing the relationship and interplay between professor and students as an essential part of the learning process.

This is largely an unanswered question. It is likely that the product space of educational offerings will continue to differentiate itself in this dimension as the underlying technologies improve and as experiments in delivery yield results.

EDUCOM, the premier organization focusing upon the application of information technology in higher education, recently reported on this issue. For a number of years, EDUCOM has sponsored a National Learning Infrastructure Initiative (NLII), focusing on how to exploit developments in information technology for educational purposes. One important conclusion that has been reached is that colleges and universities alone, without active external partnerships, are unlikely to be able to produce any significant quantity of full courseware for learning.

The supporting evidence for this conclusion comes from multiple directions, but it basically reflects a mismatch between the incentive and support structures for faculty members, and the requirements of the marketplace for successful, durable commercial products. NLII now takes the position that success in this field can only be achieved through creative — and as yet undefined — relationships between higher education and the private sector. The textbook industry provides an example of such a partnership in print technology.

NLII makes an important distinction between applications of productivity software and software that provides access to content resources, as opposed to courseware directed at supporting a substantial unit of instruction, such as a semester course. Software in the former group includes word processing, spreadsheets, access to library resources and access to content on the web. These tools are widely applicable as accessories to instruction and have already provided significant increases in instructional productivity.

Success in the latter category has been more elusive, so the ratio of successes to attempts has been more modest. There are, of course, many specific uses of information technology as a part of the instructional process, but most of the successful efforts have been aimed at supporting and enhancing the process as we know it today, not at replacing it.

One notable success is the Hippocrates Project in multimedia medical education, directed by Dr. Martin Nachbar at the NYU School of Medicine.) My own sense is that the future is not bright for shrink-wrapping courses and delivering them electronically to distant points, and that we may come to further appreciate the considerable value added through the traditional models of teaching and learning. Nevertheless, experimentation in distance learning can help us learn what this new medium can add to the increasingly diverse set of opportunities for education and training available throughout the world.

While the jury will be out for some time on the eventual use of information technology resources to assist teaching and learning, there is considerable value to be obtained by discovering, investigating in and using instructional resources to enrich the current learning experience at NYU. The ACF's Innovation Center in Warren Weaver Hall stands ready to assist faculty members to explore what exists and what is possible with information technology resources. Disciplinary specialists in the humanities, the social sciences, the sciences and the arts are available for consultation. We hope you will take advantage of the opportunity to explore how we can contribute to this process.
In my Societies and Social Sciences: Economy and Society class, we discussed “utility maximization”—in a free market, economic actors seek to maximize their utility. Computer Advocacy is on a mission to help faculty and staff maximize their students’ utility, and in my opinion, one of the best ways to improve a class that is already great is to make a website for it.

In the past year some students, faculty and staff have invested a significant amount of time and effort to build NYU Web into a worthwhile class resource. A short trip over to www.nyu.edu/classes will reveal a growing list of classes that are using NYU Web to improve the educational experience.

I did a little research in the logs of NYU Web at www.nyu.edu/classes/stats. In October 1996, the contents of the directory at the classes website received 60,000 hits. By November 1997, this statistic had grown to about 222,000 hits.

At the same time, however, when I speak to the membership of Computer Advocacy, I find that very few people are actually in a class that uses the Internet or NYU Web in its curriculum.

Bearing this in mind, here I present a sampling of class websites, to let faculty and students know what is available online.

Medieval Technology and Everyday Life
V65.0003 - Medieval and Renaissance Studies
scholar.chem.nyu.edu/~medtech
Professor Gans
paul.gans@nyu.edu

Professor Gans has assembled a very large site for all of the classes that he teaches. He runs his own Apache web server on his personal Linux machine as a hobby. The machine has been running continuously since before it was cool to be on the Internet.

Over the past several years, his site has not only grown extremely popular among his students, it has grown in popularity in the Medieval and Renaissance Studies community. He has meticulously put together a timeline of technological developments from A.D. 500 to 1600, with descriptions, illustrations and a thorough set of references. In the class assignment schedule on the website, he includes links to his site, and often to an outside site for information related to the day’s lecture.

Organic Chemistry I
V25.0243 - Chemistry
www.nyu.edu/classes/orgo
Professors Canary and Schuster
TA: Hai Mi
hqm0870@acf2.nyu.edu

This year, Organic Chemistry I has begun to use the Web more
comprehensively than any of its predecessors. Analysis of the NYU Web statistics shows these web pages are getting more hits than any other class website. This site was initiated by the teaching assistants, with cooperation from the lecturing professors. They convert weekly quizzes, homework assignments, past exams and lecture notes into HTML. After midterms and exams, answer keys and students' grades (listed by last digits of NYU ID numbers) are posted.

This site is immensely popular because it allows students to access information quickly, rather than having to wait for the next lecture. It also lessens the need for students to run to Unique Copy Center to buy copies of the notes.

Minds and Machines
V83.0007 - Philosophy
www.nyu.edu/gsas/dept/philo/courses/mindsandmachines
Professor Ned Block
ned.block@nyu.edu
TA: Hagop Janoyan
(212) 998-6322
Office Hours: Wed 4:05-5:00 pm, by appointment

Professor Block has put together an excellent set of web pages for his Minds and Machines class. They include an extensive syllabus, scanned-in slides of lecture notes, and a plethora of links for outside information related to the class material. Similar to Professor Gans's Medieval Technology pages, he provides a list of "suggested links" in his lecture schedule.

One of the most distinguishing characteristics of the Minds and Machines website is his discussion board. On the discussion board, students are encouraged to respond to topics from class.

Professor Block is very proud of the site. "I'll never teach any other way," he said. "Interested students can pursue subjects in a way that was not practical before I started this. I think this kind of thing will revolutionize teaching.

Minds and Machines
Professor Ned Block
ned.block@nyu.edu
Main Building 503E
998-8322
Office Hours: Wed 4:05-5:00 pm, by appointment
TA: Hagop Janoyan
(212) 998-6611
hj704@ac2.nyu.edu

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Evolution
V23.0058 - Biology
www.nyu.edu/projects/fitch/courses/evolution
Professor David Fitch
fitch@acf2.nyu.edu

Professor Fitch's website for his Evolution class is rich with graphics and information. He goes far beyond a simple syllabus. All the class notes are on the website, arranged topically. Even those not studying evolution right now would find the information he has provided very interesting. Because there is so much in this site, Professor Fitch also developed a sophisticated navigation system using Java to access information by lecture.

World Cultures: Mesopotamia and Egypt
V55.0501 - MAP
www.nyu.edu/classes/wright
Professor Rita Wright

This web page, one of the first ever developed for a Morse Academic Plan class, is a good example of a well-rounded web page. Professor Wright has included a copy of the syllabus and many links to outside information related to the course. With permission, she scanned in photos from sources such as the Metropolitan Museum, as well as ones she took personally. There is even a QuickTime VR image of a modern water jar from Egypt that can be rotated in 3-D.

In these classes, the students I spoke to were all impressed with the websites. Most feel that their class's site adds another dimension to the material that they are learning from their textbooks. I think it is safe to say that the students want more of their classes to use the Internet in some way. All of the professors I spoke with said that they are proud of their sites, and that they are happy to have made the effort, since the response has been so positive.

If you are interested in establishing your own presence on NYU Web, please get in touch with the people at the ACF Innovation Center, on the second floor of Warren Weaver Hall. The staff there is available to help faculty and staff get online. You are also welcome to contact any of the TAs or professors listed above.
Amidst the olive trees and formal gardens that grace the property of Villa La Pietra, a trained eye may spot a pair of directional antennas. They are but one sign of the late 20th-century wireless networking technology being used to help put NYU’s 15th-century Renaissance estate in Florence, Italy “on the Internet map.”

La Pietra is a 57-acre estate located in northern Florence. The property was bequeathed to NYU several years ago by Sir Harold Acton. The estate is made up of five villas, the most renowned of which is Villa La Pietra. The former private residence of Sir Acton is also home to a huge array of artwork and furnishings that make the Villa a landmark.

Jimmy Kyriannis (ACF’s Associate Network Manager) and I were given the task of providing Internet connectivity to the administrators and students living and working in this timeless setting.

In addition to Villa La Pietra, Carlo Cernivani is the data communications manager at ACF.

We would also be working at Villa Natalia. Natalia is being used as a residence for NYU students studying in Florence. These students currently have access to a small computer lab, where they have six PCs that run Windows 95. Before this project, their only link to the electronic world was through a single 28800 bps modem, attached to a proxy server that provides connectivity to an Internet Service Provider.

In the first phase of the project, we ordered and had delivered to us here in New York all of the hardware that we would be deploying at La Pietra. We purchased a Cisco 2514 router through which the estate would make its connection to the Internet, via the University of Florence (Università degli Studi di Firenze). That connection was to run over a dedicated two-megabit circuit, known as an E1, to another Cisco router located at the University of Florence.

We wanted to install a system at La Pietra that would provide e-mail, bootp/DHCP, Domain Name Service and web server capabilities. We acquired a Digital AlphaStation 200, running Digital Unix V4.0, for this purpose. The PC systems located at Villa La Pietra and Villa Natalia would gain network access via a pair of Asante 16-port intelligent hubs. Finally, we acquired C-Spec Corporation Overlan Wireless Bridge/IP routers to provide us the wireless connectivity that would link the student lab at Natalia to the main site at La Pietra. The speed of the wireless link would be two megabits per second, transmitted on a frequency of 915 Mhz.

While still in New York, we configured all of the equipment and ran tests over several days to ensure that all of the components and spare units were working properly. Satisfied that everything would work, we packed up the equipment and sent nine boxes of gear on ahead of us to Italy.

Once we were at Villa La Pietra and had unpacked our equipment, the first order of business was to get the router up and running over the dedicated circuit. After some difficulties, attributed to outdated software running on the router at the University of Florence, the connection was made and we had full Internet access. The next step was to put the Digital AlphaStation online. Once we made some minor configuration changes, the system was ready to go into a production mode where all of its critical services (DNS, bootp/DHCP, web server, POP server,
etc.) were up and running. The system, named lapieta.nyu.flo-
rence.it, was officially on the Internet.

The wireless component of our installation came next. For me, this was the most fun. While Jimmy was safely ensconced on the ground floor where the bridge was located, I gingerly walked across the fragile slanted roof of Villa La Pietra to where our antenna was mounted on a mast. We communicated with walkie-talkies as we fine-tuned to obtain the best possible line of sight over to Villa Natalia, which is located about 500 yards from La Pietra.

Our next job was to set up our equipment at Villa Natalia. We headed over there with a wireless bridge, hub, cables and laptops to perform configuration work and testing. The link came up flawlessly and we could interface with the objects on La Pietra’s network immediately. After some minor repositioning of the directional antenna, we were able to achieve an excellent signal strength, thus ensuring us a solid two-megabit link.

Once the bridges were up and running, we went about verifying that the PCs used in the student lab were properly registered in the bootp/DHCP server lapieta. All of the systems booted correctly over the wireless link and were ready for wireless access to the Internet. Systems used by the administrative staff in Villa La Pietra were also registered and, luckily, were able to use data wiring provided when the in-house phone system had been installed some time earlier.

Computer usage at La Pietra focuses on the basics: e-mail, word processing and World Wide Web access. Students rely heavily on e-mail to keep in contact with family and friends back in the States. Administrators rely on e-mail to conduct the day-to-day business of the estate by interfacing with administration and faculty here in New York. Everyone at the estate currently has access to an Internet Service Provider for e-mail and web access. The AlphaStation will eliminate the need for modems and the ISP by providing e-mail services to everyone locally at the estate. Its users will surely be pleased with the rapid response the AlphaStation will provide when they’re sending or retrieving e-mail messages.

Web access will now be far less painful. All the student machines had web browsers configured to run in a non-graphical mode, since the speed of the communications link was so slow. Waiting for images to download was completely out of the question. We have now set all the systems up to allow graphical Web presentations. Although the browsers are not as responsive as we’re accustomed to back home, we found it more than tolerable.

Full migration to the new network will not be completed until the beginning of the Spring ’98 semester. There are plans to provide additional computers in the student lab, and the renovation of an adjacent lounge will provide even more space for systems to be installed.

Our work, however, is not done. Another villa on the property, Villa Coletta, is slated to be renovated and will provide additional housing for visiting students. The project will equip the rooms with data wiring comparable to what is found in our dorms here in New York. There are also plans to link up the five villas with fiber optic wiring. We will be re-engineering the network topology to take advantage of this resource and keep up with the growing needs of our Florentine colleagues and students.

Carlo and Jimmy would like to thank ...

... Elisabetta Clementi, Budget Officer at Villa La Pietra, for her efforts to coordinate the project in Italy; John F. Gates, Acting Director of the Villa, for his cooperation and spirit; and the entire staff of La Pietra for their hospitality.
Global U Set to Change the Face of International Activity at NYU

Maria McDonald
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Global U

It is widely recognized that NYU has an extensive range of programs, resources and activities that comprise the University’s international portfolio. Although the number of international activities continues to grow, comments from student and faculty committees point out that not everyone on campus is as aware of this variety of international activities as they might be. According to Bob Berne, Vice President for Academic Development, many members of the NYU community do not have an easy way to find out about the international activities that are available to them.

Beginning this semester, all that is set to change, with the launch of Global U, a new initiative on NYU’s website at www.nyu.edu/global. Bob Berne has encouraged the development of the project, which he summarizes as a one-stop shop for information about everything international at NYU. “For the first time, members of the NYU community will be able to access information about all of NYU’s international activities in one place. This project fits in very well with President L. Jay Oliva’s aim for a global university. Both the President and I feel that Global U provides opportunities for a significant broadening of our horizons here at NYU.”

Global U can be accessed by all members of the NYU community — students, faculty, and staff. The website lists all the international programs, activities and resources at the university, providing links to over 20 academic programs which have an international focus, as well as to the variety of international houses and institutes which proliferate around our campus. In addition, it lists NYU’s Study Abroad programs, providing links to the relevant schools. It also provides a link to the Office of International Students and Scholars, and contains lists of student clubs and organizations of international interest.

Global U features the University’s first online international calendar, listing all the internationally focused events taking place at NYU every day. Visitors will find out about a wide variety of events, from a discussion of German film or a lecture on Arab-Israeli relations, to a Chinese instrumental music concert or an Irish dancing class. All types of events will be featured, the only requirement being that their focus be in some way international.

Global U will also provide the gateway to a number of e-mail discussion groups, known as listservs, on international topics. These discussions may cover any international subject, and members can be either experts or newcomers to the field. In list dis-
Discussions, subscribers exchange e-mail relating to the topic of interest. The benefits of this kind of discussion are many, particularly as more and more people use e-mail as a means of communication.

Through a good listserv discussion, participants can find out about relevant published materials on a subject, be alerted to upcoming events at the university and around the city, or simply make contact with other people who have similar interests. Faculty members can benefit by using lists as discussion forums for their students; student clubs may use them to pass on information to members; new foreign students can ease their loneliness by meeting others of their nationality online. The benefits are there for all to enjoy, and all you need is an e-mail account and a willingness to engage in conversation.

Global U will be online by the beginning of this semester, at www.nyu.edu/global. In order to inform people about this service, information about Global U will be disseminated to students getting their online residence hall connections through ResNet. It will also be available to all those applying for new ACF accounts. New students and faculty will learn about it at their orientation sessions, and cards and posters will be placed around the university.

Vice President Berne wants to emphasize, however, the importance of word-of-mouth in generating interest in Global U. “This is an exciting initiative — it’s really the first of its kind here at NYU,” said Berne. “We feel that it is a service which will have huge benefits to all members of the community, whether those benefits are academic or simply social. But it depends on the users. So tell your friends, give them the URL. The potential is unlimited!”

Announcing the INET’98 Conference

As the Internet continues to evolve, astounding even experts with the speed of its development, there is one constant question: How can individuals working in fields affected by the Internet, as well as the professionals who are leading and channeling this growth, stay on top of trends? The answer for many Internet professionals is the annual conference of the Internet Society: INET’98.

From July 21–24, the Internet Society has planned professional enrichment programs for Internet professionals and experts. The latest information about how the Internet is evolving will be delivered by leading Internet visionaries, including Vint Cerf, Senior Vice President of MCI. The conference will be hosted in Geneva by Mark Selby, President of the Geneva Chapter of the Internet Society, and by George Sadowsky, Vice President for Conferences, Internet Society, and Director of NYU Academic Computing.

Since 1992, the Internet Society has served as the international organization for global coordination and cooperation on the Internet, promoting and maintaining a broad spectrum of activities focused on the Internet’s development, availability and associated technologies.

The Internet Society acts as a global clearinghouse for Internet information and education, as well as a facilitator and coordinator of Internet-related initiatives around the world. Besides its annual International Networking (INET) conference, the Society sponsors other events, such as developing-country training workshops and tutorials. It produces statistical and market research, and takes part in public policy, trade and standardization activities. Through these, as well as its publications, regional and local chapters, committees and an international secretariat, the Internet Society serves the needs of the growing global Internet community. From commerce to education to social issues, their goal is to enhance the availability and utility of the Internet on the widest possible scale.

See www.isoc.org/inet98 for more information about INET’98.

— David Ackerman
NYU Web Statistics
Charting the Masses

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Everywhere we turn today, from television commercials to the sides of buses, we see web addresses. Anybody who is anybody has a website. It is no surprise that the growth of the Web has exceeded the growth of the Internet as a whole. Today the Web has a doubling period of just under six months.

NYU Web’s growth has been similarly strong. New York University put its web server in place in August 1994, and launched NYU Web in September 1995. The number of files transmitted during October 1997 was more than 7 million — over 500 times what it was for that first month two years prior. More than 200,000 people from over 140 different countries hit NYU’s website in October 1997 alone.

With the increased number of people viewing the Web, there comes a greater demand to determine exactly who they are and what they are viewing. Since the inception of www.nyu.edu three years ago, monthly statistics about traffic surrounding the entire server have been available. But, because this includes the entire NYU site, the files have ballooned to over six megabytes and are difficult to load on any browser but Lynx. In addition, charting statistics for individual sites within NYU Web is cumbersome, requiring cutting and pasting into external applications.

The introduction of a new NYU Web service will make all that work unnecessary. An improved program is generating statistical reports about activities on NYU Web. Plus, each webmaster has access to individual statistics in the same format as that of the new system-wide statistics. In addition to information about how many times each file has been transferred, there is new information including the most popular time of the day, transfers by country, full-color graphs and more. All of this is based on the accesses to your site only.

Reading the New Statistics

The full www.nyu.edu statistics, in this new format, can be viewed at www.nyu.edu/newstats. However, each individual site’s statistics will have its own unique URL. For example, for Academic Computing, the URL is www.nyu.edu/acf/stats. We will use the ACF’s statistics for our example.

When you go to your site’s stats page, you will see a summary graph of statistics for the past year. Because we started beta-testing the software in September 1997, this page starts with September’s statistics. As the months go by, it will remember the previous months’ numbers and show the differences.

Under the graph are the raw numbers for each category as well as links to previous month’s statistics. At the top of that table is a link to the current month’s statistics. The program is set to update the full statistics every morning. This way, you do not have to wait until the end of the month to see how your site is doing.

To get more detailed statistics for a month, including the current month, follow one of the links on the y-axis of the table. If you click on the current month, information is shown up to the last complete day.

The main graph is actually showing you the progress of four very different elements: hits, files, sites and kilobytes.

The first table gives you overall results for the month
including hits. There is a misconception about what a “hit” is. You cannot simply take the value for the number of hits your site has received and translate that to the number of people. Anytime a person goes to a page, the logs record at least one hit – the request for the HTML page. If that HTML page also contains two graphics, the logs record two more hits. That one page now turns into three hits! So, think of hits as the number of objects (pages, graphics, files, etc.) requested.

The number of hits (or requests) is equal to the sum of all files sent, “304 responses”, and other responses. For the purposes of this statistics program, “files” refers to the number of objects actually returned to the person. A “304 response” is when a server returns the status number 304 to a browser, which tells it that the object or image or file hasn’t been modified since the person last requested it. Therefore, the browser doesn’t waste time downloading the object again. Essentially, the file is cached on the computer running the browser (or on some other caching mechanism such as a proxy server – see below). If your site uses a graphic, such as a navigational bar, repeatedly, you will see more occurrences of a 304. The “other responses” category shows how many times the object was not transmitted because of an error of some sort. Perhaps the person requested a page he or she didn’t have permission to access.

The first table will also show you the number of unique URLs which have been sent from your site, and the number of unique sites that have visited your website. The “unique URLs” statistic shows how many of the HTML objects you have within your site, including graphics and HTML pages, were viewed at least once by somebody this month. If this number is low in comparison to the number of objects within your site, you can probably figure that either the time they visited. However, this value is somewhat inexact for several reasons (see the explanation of proxy servers below).

As you scroll down the page, you will see some of the aforementioned concepts broken down by day. If, in the middle of the month, you changed the design of your site, you could use these breakdowns to help determine its success. You will also see a list of the 30 most commonly accessed URLs within your site. Remember that not only HTML pages have URLs. Every script, graphic and object has its own URL. While this table only shows the top 30, you can still view the hits for every page. At the bottom of the page is a link to “Total Transfers by File” which gives you this information in a predictable format.

Finally, you will also find a breakdown of the type of domains visiting your site. In America, domain names typically end in .com (US Commercial), .edu (US Educational), .org (Non-
Profit Organization), or .net (Network). Most primary and secondary educational institutions use a geographical domain name such as school-name.k12.ny.us (United States). Anything ending in .us is from the United States. Other countries have their own unique two-letter endings, which the chart and graph will reflect as well. For example, if we look at October 1997, we can see that a user from Burkina Faso accessed NYU Web. The exact host name of the person hitting your site is recorded, and the statistical program creates a page of this information. However, due to privacy concerns, we suppress that information.

Proxy Servers: Questioning the Authenticity of Your Statistics

Caching is the act of storing data for later retrieval. It benefits web users because cached information is available more quickly to an Internet provider’s membership than if a member had to access an Internet-based web server directly. A browser typically caches a page once it has been requested. It may keep it on the hard drive for a while to prevent wasting time downloading the same objects repeatedly if the objects haven’t been modified.

Many organizations on the Internet, including NYU, use a network version of caching to some extent: a shared computer on the local network acts as an intermediary between end-user machines (running browsers like Netscape) and World Wide Web sites out on the Internet. Such an intermediary is called a proxy server. The first time a person retrieves a specific website via a proxy server, a copy of that page is kept (cached) on the proxy server. Subsequent attempts to access the page by anyone else whose browser is configured to use the proxy server will receive the cached version — until such time as the proxy server determines that the real page may have changed and the cached copy should no longer be distributed. Many computers at NYU, including all the machines in ACF’s public computer labs, are configured to use NYU’s proxy server. Such use of a proxy server can result in a dramatic reduction in the time it takes to obtain a web page, since any Internet delays are eliminated.

Most large Internet service providers, such as America Online, use proxy servers. If AOL didn’t use such a device, the Internet backbone — the main "pipes" for transmitting information — would be even more burdened with traffic, and the speed at which web pages are transmitted would be considerably slower. While this helps to save bandwidth, it prevents an exact statement about the number of visitors to a server.

What the New Statistics Won’t Give You

Because of the nature of the protocol used by the Web and because of the usage of proxy servers, no openly accessible (non-password protected) web server can accurately track the number of visitors to a page or site, page viewings, the user’s behavior, or the amount of time a person spends looking at your page. While many people think they will get this by spending substantial sums of money on statistical analysis packages, it cannot be done. The HTTP protocol is of a stateless nature: a connection to a web server is only open for as long as it takes to retrieve a requested object. You simply cannot figure out why visitors jump onto your page, when they leave it or why they move on.

Signing Up

Because generating these statistics on a daily basis requires a lot of CPU time, we have not automatically enabled them for everyone. This way, the server doesn’t waste time generating reports for people who are not interested in them.

If you would like to have these statistics generated for your site, send the URL of your site’s home page to webmaster@nyu.edu. It does not make a difference if your site is located within another site. For instance, statistics may be generated for www.nyu.edu/gsas as well as www.nyu.edu/gsas/dep/french. The URL of where your statistics will be stored will be provided to you at that time. You will also have the option of password-protecting your statistics directory.

Please note that these statistics are currently only available for sites within the www.nyu.edu domain. They will not work on pages.nyu.edu or on any other servers at NYU. If you are running your own server, you may wish to install the same statistics program on it.

If you would like more information about interpreting these statistics, you can visit www.nyu.edu/newstats/help for a list of frequently asked questions and instructions on how to report problems.
Ubiquitous in our environment, polycyclic aromatic hydrocarbons belong to a class of carcinogen precursor that we are exposed to every day. They are undesirable byproducts formed during combustion and hence are present in automobile exhaust, factory emissions and tobacco smoke. Thus, these chemicals contaminate our air, food and water supplies.

The polycyclic aromatic hydrocarbons can become chemically altered in our bodies, changing into highly reactive substances called diol epoxides. These diol epoxides then can bind chemically to DNA, forming substances called carcinogen-DNA adducts.

The creation of these carcinogen-DNA adducts is widely believed to be a critical initiating step in the carcinogenic process. The adducts can cause mutations in key genes involved in growth control, which can ultimately result in the formation of tumors.

This work has opened a door to the possibility of understanding a basic structural reason for differences in carcinogenic potential of chemically very similar, even mirror-image, molecules.

Remarkably, the diol epoxides that result from the biological activation can have markedly different tumorigenic potentials even when they are chemically very similar. This has been a subject of intense interest among biologists and chemists in the field of cancer research.

Benzo[a]pyrene is a polycyclic aromatic hydrocarbon that has long been studied as a paradigm for the fascinating chemical structure/tumorigenic potency relationship. In particular, benzo[a]pyrene can be biochemically altered into, among others, one pair of diol epoxides that are mirror images of each other; these are known as (+) and (-) anti benzo[a]pyrene diol epoxide (BPDE).

Intriguingly, the (+) BPDE is tumorigenic in rodents, while the (-) BPDE is not. Both link themselves to DNA at the same site, the amino group of the base guanine. For nearly twenty years, a leading question has been how the (+) and (-) BPDE-DNA adducts differ in structure.

A combined multidisciplinary approach has permitted the elucidation of these structures. Breakthroughs in the chemical synthesis of these adducts, pure and in large quantities (milligram amounts) occurred in the group headed by Dr. Nicholas E. Geacintov, professor of chemistry here at New York University, with vital contributions by Dr. Shantu Amin of the American Health Foundation. High resolution nuclear magnetic resonance (NMR) data were obtained and interpreted in the laboratory of Dr. Dinshaw J. Patel, now at Memorial Sloan Kettering Cancer Center. Dr. Monique Cosman, while a graduate student in the Geacintov laboratory and later a post-doctoral researcher in the laboratory of Patel, also played a key role. And finally, the molecular views that agreed with the data were computed by molecular mechanics calculations by
Figure 1: (+) BPDE DNA adduct on left; (-) BPDE DNA adduct on right.

Dr. Brian E. Hingerty of the Oak Ridge National Laboratory and Dr. Suse Broyde, professor of biology at NYU.

The results revealed that the BPDE adducted moiety is aligned oppositely along the DNA double helix in the (+) and the (-) case. It is situated in what is known as the minor groove, at the helix exterior. However, the DNA double helix has a directionality, since it is not symmetric. The directionalities are known as the 5-prime direction and the 3-prime direction. In the (+) case the BPDE moiety points in the 5-prime direction of the damaged strand, while it points 3-prime in the (-) case. In a fixed view of the DNA, this can be described as pointing up or pointing down (Figure 1).

Interestingly, this opposite orientation phenomenon had been predicted from molecular mechanics computations in the Broyde-Hingerty-Geacintov collaboration, prior to the independent synthesis and high resolution NMR experiments.

The finding for this mirror image pair of BPDEs has now proved to be a broad, general principle, true for other (+) and (-) pairs of diol epoxides stemming from different polycyclic aromatic hydrocarbons, whose carcinogenic potentials differ. The diol epoxide may bind to a different base than guanine, notably the base adenine; it may reside in a position different from the minor groove; and the diol epoxides originating from different polycyclic aromatic hydrocarbons have different numbers and types of rings in them. Nonetheless, the members of the (+)/(-) pair are oriented oppositely in the DNA in every case observed so far, some half dozen pairs at least.

The origin of the opposite-orientation effect has been studied extensively by Xiao-ming Xie, a graduate student in the Chemistry Department who is advised by Professors Nicholas E. Geacintov and Suse Broyde. He has carried out extensive molecular mechanics calculations of the BPDE (+)/(-) adduct pair in a very simple DNA sub-unit, a nucleoside, which contains just...
one BPDE-adducted guanine base together with its attached sugar (Figure 2).

A large number (373,248) of possible structures were created for the (+) case, and a like number for the (−), permitting a very thorough search for all possible structural types. Energies of all the structures were computed, and low-energy, favored structures were evaluated. Four types of low-energy structures were found from these computations for the (+) adduct and four for the (−).

Remarkably, each of the four structures from the (+) adduct was a mirror image of one of the four from the (−) set at the base guanine-adducted BPDE level. Only the sugar attached to the guanine broke the symmetry (Figure 3). Moreover, the origin of the opposite-orientation phenomenon became clear: when the BPDE moiety in the (+) case was turned to the position it adopts in the (−), and vice-versa, the structure became too crowded, a phenomenon known as steric hindrance.

The striking opposite-orientation effect is a plausible underpinning behind different biological outcomes, since the enzymes that must interact with the lesions during DNA replication and repair would be confronted with opposite orientations, if the opposite-orientation phenomenon were also true under the biological conditions. Thus, this work has opened a door to the possibility of understanding a basic structural reason for differences in carcinogenic potential of chemically very similar, even mirror-image molecules. Ultimately, one hopes to develop a library of structural hallmarks associated with mutagenicity and carcinogenicity. Then, it might be possible to computationally predict which substances are harmful and which benign. This would avoid the laborious, expensive and controversial tests in mammals that are now absolutely necessary to identify carcinogenic substances.

Figure 3:
The four pairs of structures for (+) and (−) BPDE nucleoside adducts. In each pair, (+) is on the left and (−) is on the right. The guanine is being viewed edge on. Note the mirror-image symmetry in the members of the pairs, broken only by the sugar which is at the bottom of each structure.
NYU is experiencing growth in the use of Internet services by students, faculty and staff. As a result, ACF has had to increase the number of Internet Services (IS) machines and modems, and is automating more of its systems to accommodate the exponential growth in usage of e-mail, web access, DIAL, labs and HelpDesk.

Since the new scheme for obtaining NYU-Internet accounts was implemented, many questions have been asked by students, faculty and staff. The following may give you a better picture of the accounts process.

How do I apply for and activate my Internet account?

To apply:
Go to www.nyu.edu/acf/start, and follow the instructions on the web page. This URL must be accessed from the NYU campus (in other words, from an ACF lab computer, library computer, public NYU-Internet Station or a computer in your office that has a direct connection to NYU-NET) using a web browser.

To activate:
Follow the instructions to activate your account and set your initial passcode. The final step is authentication by a member of our staff, which is done by presenting your current NYU-ID card in person. Faculty and staff members do this at the Accounts Office, while students can go to any ACF lab. When you are finished with the process, your e-mail account will be activated within 30 minutes, with DIAL access activated within 24 hours.

Why do I need to go through these steps and then physically visit a lab to activate my account?
We understand that this final step may not seem necessary; however, be assured it is a crucial one in the process of securing accounts for the NYU population. This step precludes someone who has obtained your personal information from opening an account in your name. We are moving toward a system where online authentication will eliminate the need for this, but until the system is in place, we need this step to protect users.

Can I have the same passcode for my e-mail and my DIAL access?
Yes. In fact, when you open an account according to the following scheme, you will be setting the passcode for both your e-mail and your DIAL access.

For e-mail and DIAL service accounts opened prior to the Fall 1997 semester:
If your e-mail account was obtained prior to August 1997, you will still need to follow the menu-driven directions on your IS machine to change your passcode. You do have the option to make your DIAL and e-mail passcodes the same. Your DIAL passcode can be changed via the www.nyu.edu/acf/start page regardless of when you received your service.

For accounts opened during or after the Fall 1997 semester:
If your e-mail account was obtained in August 1997 or after, your e-mail and DIAL service are synchronized. This means that if you change the passcode for one, the other is automatically changed. Your passcodes can be changed via the start page.

Shaaron Francis is the Assistant Director for Business Administration at ACF.
My e-mail account and DIAL service were opened last year. When will my accounts be “synchronized?”

We are working to synchronize all of the NYU-Internet servers so that your e-mail and DIAL service will be bundled by Fall 1998. This will enable all NYU users to synchronize passcodes and change them via the web.

What if I forget my passcode?

Stop by any ACF lab (for students) or the ACF accounts office (for faculty and staff) to request a passcode change. We realize that it may be difficult sometimes to make the trip; however, it is important to keep your accounts secure. When you physically come into our offices or our labs, we check your NYU ID to ensure we are giving the passcode to the true owner of the account.

How often should I change my passcode?

You should change your passcode every six months. This is especially important if you use a POP mailer such as Eudora. Our IS systems expire passcodes every six months, and direct you to make this change, but not all POP mailers do. It is a good practice to log directly into your account on a regular basis to read updates, and also to ensure that your passcode does not expire.

Where do I get software and documentation for NYU’s DIAL service?

Bring a formatted disk to the ACF lab that supports your platform:

For both Mac and PC:
Third Avenue North
Residence Hall – 75 Third Ave., level C
HelpCenter – 251 Mercer Street, 2nd floor

For Mac only:
Education Building– 35 West 4th St., second floor

For PC only:
Tisch Hall – 40 West 4th St.,
lower concourse
14 Washington Place – lower level

The documentation to support the software is also available at these sites.

Are there any new developments on the horizon to make this process easier for us?

Yes. This year we enabled satellite account offices in the Dental and Law Schools. We are working toward automating all NYU-Internet account creation, as well as the creation of class accounts. We have new servers and are now writing code to handle online authentication of users, so that the process of applying for and activating an Internet account with DIAL service can be done without having to authenticate yourself in person. ACF will continue to explore new and emerging technologies to make this process easier for the user.

There are other questions and answers regarding accounts, expirations, usage and more on our ACF Accounts Page, www.nyu.edu/acf/accounts. From there you can link to information about Internet Accounts at NYU. Also, feel free to e-mail us at acf.accounts@nyu.edu.

Q: Browsing the World Wide Web can occasionally seem baffling. Sometimes I can get to a favorite website, but other times I can’t. Why?

A: Sometimes the page you request doesn’t appear. There are many reasons why this may happen. It may mean that the remote computer is having trouble. Often, if this web-hosting computer, or server, is down for maintenance, you will not be able to see any of the web pages stored (or hosted) on that machine.

It could also be that the page in question has changed its address (or URL), but left no forwarding address. Or it could be an increasingly popular site, so you’re getting the cyber-equivalent of a busy signal. It could also be a networking problem somewhere between your computer and the hosting computer.

Simply try accessing the site again later. If you still cannot access a page, and you know that the URL is correct, you can check for announcements at www.nyu.edu/acf/status, to see if NYU may be having
From the Postmaster
Dealing with Spammers

Jane DelFavero
postmaster@nyu.edu

This issue’s From the Postmaster column begins with a quiz:

Spam is:

a) a highly spiced luncheon meat suitable for serving to the most distinguished guests (especially if you stick cloves in it).

b) the subject of a truly funny Monty Python skit and countless websites.

c) the lowest form of Internet discourse, suitable only for clueless newbies and evil minions of darkness who have to hide their identities for fear of retribution.

Answer: all of the above.

E-mail users are not as enthusiastic as the members of Monty Python about the dubious attributes of spiced luncheon meat. In fact, so low is their regard that they have used its name to describe what may be the most reviled form of communication on the Internet.

What is spam?
The term “spam” describes unsolicited bulk e-mail or news postings sent by professional bulk mailers, scam artists or individual users. The sender usually wants to make money from the mailing, but sometimes spam is meant merely to annoy or insult. Its prime distinguishing characteristic is that the true source of the mail has been hidden, because the sender knows that you may not want to receive it. Any user who has gotten mail telling her how to “MAKE MONEY FAST!!!!!!”, where to find an X-rated website, or how to repair her credit in five easy steps has been subjected to spam.

The dawn of spam began with the now infamous “Green Card” deluge, in which the immigration law firm of Canter and Siegel sent out over 600 postings to unrelated newsgroups, advertising its ability to help individuals get

connectivity problems.

It could also be that your version of Netscape is too old. If you are using Netscape Version 1 or 2, you should upgrade to a newer version; instructions to do this can be found at www.nyu.edu/acf/help.

Finally, if there is no known networking problem and you know that the URL is correct, you can, as a last resort, write to webmaster@host.name (replacing host.name with the domain name in the URL in question, such as nyu.edu) and ask whether they are still hosting those pages.

Q: But sometimes it seems that I can only see NYU websites, but not pages from anywhere else.

A: You could be experiencing one of the problems listed above, or you may have a simple configuration issue. If you are trying to run Netscape from a laptop in the library or a computer in an ACF lab, then make sure that it is configured to use the proxy server. Please check out www.nyu.edu/acf/pubs/roaming for more information and instructions regarding use of the proxy server.

This problem illustrates the difference between the Intranet (in the form of NYU Web pages) and the Internet (in the form of websites that come from outside NYU).
green cards in an upcoming government lottery. “Why is this garbage here?” cried outraged readers, who then let their feelings be known in voluminous responses to the senders.

At the same time, direct marketers were crying, “Why didn’t I think of this first?” Overnight, organizations sprouted up to provide mailing services for would-be spammers. The most notorious of these, Sanford Wallace’s CyberPromotions, acted on an important lesson learned from the Green Card mailing: Don’t provide a usable return address on bulk e-mail, or you’ll be mail-bombed out of existence.

The allure of unsolicited bulk e-mail is simple. With a moderately sophisticated mail program, access to the Internet and a few hundred dollars to buy a list of addresses, you can send mail to thousands of addresses for little more than the cost of sending to one. Bulk paper mail requires printing and postage; spam does not. It shifts the cost of advertising to the recipient, who has to pay to store and handle this additional mail, or to the recipient’s Internet Service Provider, since most people pay a flat fee for usage, no matter how much mail they get. This explains why most ISPs are as anxious as recipients are to end spamming.

**Why me?**

Users hate spam because it gets in the way of mail that they really want to read, and it pierces the veil of privacy that they think surrounds their e-mail information. Each semester, Postmaster mail is filled by newbies crying, “How did they get my address?” You may have filled out an online questionnaire, or posted to a Usenet newsgroup, or mailed to a large mailing list. All of these venues are ripe for address harvesting.

Some unscrupulous list builders even hack into systems just to grab e-mail addresses. The spammer is not concerned that all the addresses are active, just that enough of them are functioning to generate a profitable response to his ad. Even if the response rate is one in a thousand, or one in ten thousand, the spammer can make a profit. Once the list is generated, it can be reproduced and sold, so the ultimate sender may not even know the real source of the addresses.

Mainstream businesses want to use e-mail as a legitimate extension of the marketplace. They therefore wish to limit spamming while maintaining their own ability to send commercial mail. Compare the spammer’s behavior to the way legitimate vendors use their lists. If you fill out a questionnaire at Apple Computer’s website, Apple might use the information there to try to sell you a computer or peripheral. They won’t, however, try to sell you Amway products. Your information and buying preferences are too valuable for them to risk losing your goodwill. Similarly, general sites such as Yahoo often sponsor contests as a way to get users to fill out forms and reveal information about themselves; however, users are allowed to opt out of receiving more information and the mail always comes from a functioning address.

**How can I stop spam?**

The best way to stop spam is to prevent your address from...
getting out there. Before you submit any information about yourself to a website, make sure that you know how that information will be used. Don’t join e-mail discussion lists. Don’t use Internet Relay Chat. Don’t open your door to strangers ... I think you get the point. Anything you do on the Internet that has your name attached can make you a target for spammers. So, how can you fight back?

Filtering

Many e-mail programs, such as Eudora, provide the ability to separate mail based on characteristics such as the sender’s name or the message subject. The filtered mail can be automatically sent to the trash, or dealt with in some other way. This method has some drawbacks. First, the mail still has to be downloaded, which can waste a considerable amount of time. Second, filters require that the recipient know something about the mail before it is received. Spammers avoid sending mail from the same location; they hide or forge their addresses and they come up with new subject lines to make their mail appear (at first glance) to be legitimate.

Using overly general filtering parameters can also result in the loss of legitimate mail. For example, some ISPs have a reputation for hosting spammers. If you set your mailer to dump all mail from those ISPs to the trash, and your best friend gets an account with that ISP, his mail will go straight to the trash as well. The same problem can happen when an ISP tries to filter mail on a system-wide level. The filters may slow down mail delivery or filter out mail from legitimate senders.

Direct Response

In order to respond directly to a spammer, you have to be able to read Internet mail headers. (To learn how to do this, see the Fall ‘97 issue of Connect.) Look at the “Received” lines and follow them back to the original source. You can then write to “postmaster@” that domain name. Whether you get a positive result depends on the type of host. For example, most educational institutions (including NYU) have a “No Commercial Use” policy, so spammers are not tolerated. Also, the mail might have passed through their domain illicitly, so the system administrators can plug up any security leaks of which they had been unaware.

Even commercial ISPs may not tolerate spammers if they receive enough complaints. Recently, agis.net stopped hosting CyberPromotions because of the rising level of complaints, although they were forced by a local court to give thirty days’ notice.

Theoretically, you could also write to the International E-Mail Marketing Consortium to request that your name not be included in bulk mailing lists, as you can with regular junk snail mail. However, their website (www.iemmc.com) goes to a blank page at agis.net, presumably because the largest member of the IEMMC is none other than CyberPromotions.

Legislative Attempts at Regulation

Pressure from users and legitimate marketers has caused a flurry of legislative activity around the issue of spam. There are several competing bills before Congress (see www.yahoo.com/Computers_and_Internet/Communications_and_Networking/Electronic_Mail/Junk_Email/Laws_and_Bills), most of which focus on the right of marketers to sell stuff to you, while giving you some right to opt out. Strong proponents of the rights of Netizens, such as the Coalition Against Unsolicited Commercial Email (www.cauce.org) prefer H.R. 1748, proposed by Rep. Christopher Smith (NJ) which seeks to extend the present legislation against the sending of unsolicited commercial faxes to the world of spam. This legislation would bar the use of:

... any computer or other electronic device to send an unsolicited advertisement to an electronic mail address of an individual with whom such person lacks a preexisting and ongoing business or personal relationship, unless such individual provides express invitation or permission.

However, since this would bar most if not all commercial e-mail, it is strongly opposed by commercial forces.

As long as there is money to be made on the Internet and no one to stop them, there will be spammers. It is up to users to decide how much of this they will endure and to make their feelings known to the people in power. If your ISP hosts spammers, let them know that you will switch providers if they do not institute rules for bulk mailing. Ultimately, your money talks. If spammers cost more than they pay in subscription fees, no one will host them.
Stacy Horn says she started Echo to meet guys. She succeeded. But she never imagined what would follow. In her refreshing debut book, Cyberville, she offers an engaging tour of how one successful online community came to life under her careful guidance.

Echo (www.echonyc.com) is a computer service in New York City that is part bulletin-board system, part Internet access provider and part clubhouse. It’s crammed with smart, articulate people (40 percent female — higher than most Internet demographic surveys indicate), who have perversely differing opinions on any topic imaginable.

The kind of creative friction that results, for good and bad, turns this raw computer system into a living, breathing entity. Readers see how Horn — a graduate of NYU’s Interactive Telecommunications Program and currently an instructor there — is often as surprised by Echo as its subscribers are.

Tim O’Connor has both used and managed many online communities.

Echo is not a flashy system. It is text-based, and users type short commands to navigate menus and sub-menus. With edited transcripts, Horn shows how conversations on Echo take place. Excerpts from “I Hate Myself,” a thread in which Echoids try to outdo each other in humorous self-flagellation, are scattered throughout the book.

The focus in Echo, and in this book, is almost always on content over form. Even emoticons are banished from Echo (along with personal attacks and harassment). It’s about communication. “History likes to tell big stories,” Horn says in Cyberville. “Well, people like to tell the smaller ones. Our own cuts and scrapes and ... new jobs, lost jobs, whatever, this is what we think about, gossip about, the things that happen every day, the stuff we talk about endlessly. These are the stories of our lives.”

Cliff Stoll, a writer and scientist, spoke out against the mindless use of the Internet in Silicon Snake Oil (Doubleday, 1995). Without entering into a debate about the ethical implications of being online, Horn simply presents a portrait of one online community to demonstrate that such communities do not simply create themselves. They must be seeded, tended, encouraged and vigorously maintained.

As Echo evolved, Horn learned, by trial and error, what works well to encourage a sense of responsibility among people online, and what fails miserably. There is a demand for humane computing. As long as that demand exists, there will be a need for systems like Echo, guides that make the online world friendly.

There will also be a need for people like Horn, who claims that she doesn’t know about business and grand visions, but emerges in Cyberville as a natural leader. This book is her travelogue, her chance to speculate on what will come next for her and for Echo. Ultimately, it’s her attempt to make sense of it all.

As the Echo prompt famously says, “And now?”

Just about anything.
Spring '98 Schedule

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<td>World Wide Web Browsing &amp; Publishing Series</td>
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<td>World Wide Web Graphics</td>
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About ACF's Spring Classes and Talks

This spring we have added new and exciting talks on the use of digital technology in the arts, humanities and sciences, as well as new topics in digital multimedia.

All members of the NYU community are welcome at ACF's classes, workshops and talks. There is no charge for any of the ACF classes, but participants should have a valid NYU Card.

Seating capacity: To avoid overcrowding, we have listed maximum seating capacities for each class. We recommend that you arrive a few minutes early in order to secure a spot.

Classes by arrangement: Faculty members may arrange special classes for a specific course or research group. These do not necessarily have to be given at an ACF site. For classes in statistics, call Frank LoPresti (998-3398); for other applications, call the ACF Innovation Center (998-3044).

Additional information: A list of ACF locations and phone numbers, and pointers to further information about ACF resources, can be found on page C-8.

—VINCENT DOOGAN
Associate Director, ACF
vincent.doogan@nyu.edu
### Listing by Date

#### Friday, January 23
- Internet & E-mail  
- ResNet  
- C-4  
- C-5

#### Tuesday, January 27
- Using a Mac at an ACF Lab  
- Using a PC at an ACF Lab  
- C-3  
- C-3

#### Wednesday, January 28
- Using a Mac at an ACF Lab  
- Using a PC at an ACF Lab  
- C-3  
- C-3

#### Thursday, January 29
- Using a PC at an ACF Lab  
- C-3

#### Friday, January 30
- Internet & E-mail  
- ResNet  
- C-4  
- C-5

#### Saturday, January 31
- Using a Mac at an ACF Lab  
- Using a PC at an ACF Lab  
- C-3  
- C-3

#### Monday, February 2
- Intro to SAS  
- C-7

#### Tuesday, February 3
- Using a Mac at an ACF Lab  
- Using a PC at an ACF Lab  
- C-3  
- C-3

#### Wednesday, February 4
- Resources for Humanities  
- Using a Mac at an ACF Lab  
- Using a PC at an ACF Lab  
- Using Unix at ACF  
- NYU-NET Software (PC)  
- C-4  
- C-3  
- C-3  
- C-3  
- C-5

#### Thursday, February 5
- Using a PC at an ACF Lab  
- Intro to SPSS  
- C-3  
- C-7

#### Friday, February 6
- Image Scanning (Mac)  
- Internet & E-mail  
- Choosing Your Computer  
- Using Unix at ACF  
- Intro to World Wide Web  
- C-6  
- C-4  
- C-2  
- C-3  
- C-5

#### Saturday, February 7
- Using a Mac at an ACF Lab  
- Using a PC at an ACF Lab  
- C-3  
- C-3

#### Monday, February 9
- Intermediate SAS  
- C-7

#### Tuesday, February 10
- Digital Resources for Artists  
- C-3

#### Wednesday, February 11
- Virus Protection & Backup  
- Intro to Scientific Computing & Visualization  
- C-3  
- C-6

#### Thursday, February 12
- Intermediate SPSS  
- C-7

#### Friday, February 13
- Understanding Your Computer (Mac)  
- C-2

#### Tuesday, February 17
- Intro to Authoring Tools  
- C-6

#### Wednesday, February 18
- Electronic Texts & Analysis  
- NYU-NET Software (Mac)  
- Intro to SAS  
- C-4  
- C-5  
- C-7

#### Friday, February 20
- Intro to MS-Word  
- Internet & E-mail  
- ResNet  
- Intro to HTML  
- C-7  
- C-4  
- C-5  
- C-6

#### Monday, February 23
- Intro to SPSS  
- C-7

#### Tuesday, February 24
- PowerPoint  
- C-6

#### Wednesday, February 25
- Scientific Visualization  
- News Groups  
- Intermediate SAS  
- C-6  
- C-5  
- C-7

#### Friday, February 27
- Image Scanning (Mac)  
- Understanding Your Computer (PC)  
- Advanced HTML  
- C-6  
- C-2  
- C-6

#### Monday, March 2
- Intermediate SAS  
- C-7

#### Tuesday, March 3
- High-Performance Computing Resources  
- C-6

#### Wednesday, March 4
- Multimedia & the Humanities  
- NYU-NET Software (PC)  
- C-4  
- C-5

#### Friday, March 6
- Internet & E-mail  
- Graphics for the Web  
- Intro to Excel  
- C-4  
- C-6  
- C-7

#### Tuesday, March 10
- Qualitative Analysis Tools  
- C-7

#### Wednesday, March 11
- Up- & Downloading (PC)  
- C-5

#### Wednesday, March 18
- NYU-NET Software (Mac)  
- C-5

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**ABCs of Computers**

- [www.nyu.edu/acf/labs/](http://www.nyu.edu/acf/labs/)
- [www.bookc.nyu.edu/computer/](http://www.bookc.nyu.edu/computer/)

**Choosing Your Computer (Mac and PC)**

This talk is intended to help you select the best personal computer for your needs. It will cover the basic components of a computer, as well as the other hardware required for various tasks. We will also discuss how you can assess your particular needs to establish your criteria for selecting computer tools. NYU Computer Store staff.

Warren Weaver Hall, room 313  
Seating capacity: 30; first come, first served; talk.

**Friday, February 6**  
12:00-1:30

**Understanding Your Computer (Mac and PC)**

This introductory talk will help you learn about your computing equipment. It will focus on such basic
operations as setting up your computer, setting up a printer, and configuring your operating system with the fonts and tools you need. Discussion will include troubleshooting techniques and other strategies for dealing with problems you might encounter while using your computer. NYU Computer Store staff.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.

1. For Mac Owners
   - Friday 12:00-1:30
   - February 13

2. For PC Owners
   - Friday 12:00-1:30
   - February 27

Using a Mac at an ACF Lab
A hands-on introduction to the Macintosh computer. Topics include the ergonomics of proper computer use; working with the graphical user interface; understanding the file system; choosing printers, file servers and other devices; and launching software applications. ACF staff.

Education Building, 2nd floor
Seating capacity: 15; first come, first served; hands-on class.

   - Tuesdays 11:00-12:00
     - January 27
     - February 3
   - Saturdays 11:00-12:00
     - January 31
     - February 7

   - 3rd Ave. North Res. Hall, level C-3
   - Seating capacity: 15; first come, first served; hands-on class.
   - Wednesdays 1:00-2:00
     - January 28
     - February 4

Using a PC at an ACF Lab
A hands-on introduction to the PC – running Microsoft Windows. Topics include the ergonomics of proper computer use, working with MS-Windows in the labs, understanding the file system, choosing printers and file servers, and launching software applications. ACF staff.

Tisch Hall, room LC8
Seating capacity: 15; first come, first served; hands-on class.

   - Saturdays 11:00-12:00
     - January 31
     - February 7

14 Washington Place, basement
Seating capacity: 15; first come, first served; hands-on class.

   - Tuesdays 1:00-2:00
     - January 27
     - February 3
   - Thursdays 11:00-12:00
     - January 29
     - February 5

   - 3rd Ave. North Res. Hall, level C-3
   - Seating capacity: 15; first come, first served; hands-on class.
   - Wednesdays 11:00-12:00
     - January 28
     - February 4

Protecting Your Files:
Anti-Virus & Backup Strategies
(Mac and PC)
This talk will focus on strategies to protect classwork, research project data and other documents. Viruses will be explained and use of virus protection will be demonstrated. Various backup strategies will be outlined. ACF staff.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk/demonstration.

   - Wednesday 12:00-1:30
     - February 11

Using Unix at ACF
An introductory class on using the Unix operating system, variants of which run on several different types of computers at ACF. Most are accessed at ACF labs through PCs, Macs and terminals, but the SGI workstations also use Unix. The basics will be covered: logging onto the host machines, organizing files, editing text, printing files and using applications. ACF staff.

   - ACF Unix account required.

www.nyu.edu/altg/

Digital Resources for Fine Artists
Oriented towards Arts faculty and graduate students, this session will provide a broad state-of-the-digital-arts overview and update, as well as focused presentation of ACF and other University resources available to artists working with digital media. Topics will include high resolution film input and output, color management, tools for video and audio production and installation, alternatives
2. Introduction to HTML
Beginning with the basics of what an HTML file looks like, the speaker will explain the structure of a document and its HTML elements. Sample pages will be analyzed and constructed. Topics will include tags, links, URLs and embedded graphics.

Warren Weaver Hall, room 101
Seating capacity: 50; first come, first served; talk.
Friday 2:00-3:30
February 20

3. Advanced HTML Topics
This session focuses on including images on your Web pages; “image maps,” frames, CGI, Java and plugins will be explained.

Warren Weaver Hall, room 101
Seating capacity: 50; first come, first served; talk.
Friday 2:00-3:30
February 27

4. Graphics for the Web
(see entry under Multimedia)

Multimedia

Introduction to Authoring Tools
A survey of four software applications for integrating multimedia in web-based and CD-ROM-based presentations. These will include: PowerPoint, Flash, Director and Authorware. Vincent Doogan.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Tuesday 2:00-3:30
February 17

Image Scanning (Mac)
A focused class in the use of Photoshop with a flatbed scanner to digitize photographs and artwork. Basic knowledge of the Macintosh is required. Jeffrey Lane.

Education Building, 2nd floor
Seating capacity: 25; first come, first served; hands-on class.
Fridays 1:00-2:30
February 6, 27

Graphics for the Web
This session focuses on methods for designing and preparing graphics for the World Wide Web. Topics include: creating small fast-loading graphics, cross platform compatibility, scanning tips, image maps, animated GIFs and more. Kristina Abeson.

Warren Weaver Hall, room 101
Seating capacity: 50; first come, first served; talk.
Friday 2:00-3:30
March 6

PowerPoint (Mac, Windows)
PowerPoint presentation software is platform-independent, part of the Microsoft Office suite. This demonstration and workshop will explain the main features of PowerPoint and how best to use it for lectures and other public-speaking activities. The discussion will include using text and graphics, slide transitions, and options for displaying or distributing a completed presentation. Jeffrey Lane.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Tuesday 2:00-3:30
February 24

Scientific Computing and Visualization
www.nyu.edu/acf/science/

Introduction to Scientific Computing & Visualization
An overview of local and remote computing and visualization resources. Presentation will include available software, workstations, color printing and videographics devices. Adel Hanna.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Wednesday 2:00-3:30
February 11

Scientific Visualization
This talk will focus on scientific visualization software, including AVS, tecplot, SGI Cosmo and Iris Explorer, among others. ACF staff.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Wednesday 2:00-3:30
February 25

High-Performance Computing Resources (NYU multi-processors: NSF supercomputers)
An introduction to high-performance computing at NYU and elsewhere. The speaker will discuss the uni- and various multi-processor systems at NYU and the various systems available at the NSF supercomputing centers. Hua Chen.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Tuesday 2:00-3:30
March 3
High-Performance Parallel Computing Workshop

This two-day event will consist of lectures and direct experience with parallel programming techniques on distributed and shared memory multi-processor systems. Topics will include: a survey of hardware and software for parallel computing at NYU and Supercomputing Centers; a discussion of scientific applications suitable for parallelization; an introduction to parallel programming techniques and paradigms including MPI and HPF; a discussion of scheduling and job management policies and practices at NYU; and hands-on experience programming, debugging and monitoring various multi-processor parallel systems using language processors and libraries such as Fortran, C and MPI. ACF staff.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; workshop.
Tuesday & Wednesday 2:00-3:30 April 7, 8

Statistics, Databases and Spreadsheets

www.nyu.edu/acf/socsci/

Introduction to Excel (Mac)

Microsoft's Excel is a major spreadsheet for the Mac. A start-up talk-demonstration on creating a basic spreadsheet. Howard Fink.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Friday 2:00-3:30 March 6

SAS (Windows, Unix)

This series will progress from the basic description and operation of this statistical package to advanced concepts and usage. Robert Yaffee.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.

1. Introduction to SAS
   Monday 6:00-7:30
   February 2
   Wednesday 6:00-7:30
   February 18

2. Intermediate Topics
   Monday 6:00-7:30
   February 9
   Wednesday 6:00-7:30
   February 25

SPSS for Windows (Windows, Unix)

SPSS (Statistical Package for the Social Sciences) is a comprehensive, integrated system for statistical data analysis. These presentations will use either the Windows or the newer Unix version, but the programming concepts are applicable to all versions of SPSS. Frank LoPresti.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.

1. Introduction to SPSS
   Data input, transformations of variables, creation of "system files," and other manipulations of data will be discussed.
   Thursday 6:00-7:30
   February 5
   Monday 6:00-7:30
   February 23

2. Intermediate Topics
   Thursday 6:00-7:30
   February 12
   Monday 6:30-7:30
   March 2

Qualitative Analysis Tools (QSR NUD*IST)

This talk will introduce qualitative data analysis and survey the software tools currently available. The talk will include a demonstration of NUD*IST (Non-numerical Unstructured Data Indexing Searching & Theorizing) software from QSR and TextSmart from SPSS. Frank LoPresti.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Tuesday 2:00-3:00 March 10

Microsoft Word (Mac and PC)

Microsoft Word is a major word-processing program on Macintosh and PC computers and is especially strong on typography and formatting. This is a getting-started talk/demonstration. The basics of creating a document will be covered. Howard Fink.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Friday 2:00-3:30 February 20
Important Dates for Users of ACF Services

(For updates to this list, please check NYU Web at www.nyu.edu/acf/nyu-events/)

Jan. 4 — Fall '97 class accounts expire.
Jan. 19 — Martin Luther King, Jr. Day.*
Jan. 20 — Spring ‘98 semester begins; ACF labs’ regular hours begin.**
Feb. 16 — Presidents’ Day.*
Feb. 20 — Students’ Class Account Responsibilities forms due back.
March 16-March 21 — Spring Recess**
March 23-April 24 — Instructors apply for Summer ‘98 class accounts.
April 1-May 29 — Instructors apply for Fall ’98 class accounts.
April 30-May 15 — Students expecting incompletes in courses should apply for account extensions. Instructor’s signature required.
May 4 — Last day of classes.
May 5-23 — Students with class accounts should store files they wish to keep after their accounts expire.
May 13 — Spring ‘98 semester ends; ACF labs’ summer hours begin.**
May 18 — First summer session begins.
May 25 — Memorial Day.*
June 1 — Spring ‘98 class accounts expire.

*NYU holiday: Labs & offices closed.
**Please check at labs and at above Web address for updates on ACF hours.

Additional Information

Class Locations
www.nyu.edu/acf/classes/
The following are the street addresses of the locations referred to in the course descriptions.
Warren Weaver Hall, 251 Mercer Street
14 Washington Place, lower level
Education Building, 35 West 4th St., 2nd floor
Third Avenue North Residence Hall, 75 Third Ave., C-3
Tisch Hall, 40 W. 4th Street, lower concourse

HelpCenter
www.nyu.edu/acf/help/
251 Mercer St., 2nd floor 998-3333
Troubleshooting; software distribution; information about ACF services and academic support.

Accounts Office
www.nyu.edu/acf/accounts/
251 Mercer St., 3rd floor 998-3035
Faculty and staff account applications and information: individual, coursework (class), and NYU-Internet accounts. DIAL service applications for faculty and staff.

Innovation Center
www.nyu.edu/acf/ic/
251 Mercer St., 2nd floor 998-3044
Discipline-oriented resources and services for faculty and advanced students; instructional computing support; new and emerging technologies.

Student Computer Labs
www.nyu.edu/acf/labs/
14 Washington Place 998-3457
Education Building 998-3421
3rd Ave. North Res. Hall 998-3500
Tisch Hall 998-3409
Student NYU-Internet account and DIAL applications; computer and Internet access. (See ACF flyers and above Web address for hours and rules of access.)

Publications
www.nyu.edu/acf/pubs/
Pamphlets, flyers, brochures and the magazine Connect for users of NYU computer and network services. Printed copies are available at the HelpCenter and labs; online editions are at the above Web address.

News and Announcements
www.nyu.edu/acf/nyu-events/
Updates on hours and services; special events and other notices of interest.
A New Domain Name System Management Design

Chetan Dube
chetan.dube@nyu.edu

One of the most basic network management functions performed at ACF is the maintenance of our domain name system database, a continually changing record of the Internet name and address of each computer (or "host") attached to NYU-NET. Each new machine must be assigned an appropriate name within the nyu.edu domain as well as a unique, previously unused numerical address from the set of numbers assigned to the university.

For example, the university’s central World Wide Web server is named www.nyu.edu and has the numerical address 128.122.253.80. Both of these designations are unique within the Internet, and form the basis for communications with this machine.

The domain name system (DNS) is a distributed database of host information: the NYU portion of the DNS is maintained here at the university, other sites on the Internet do the same, and the whole DNS is interlinked so that a computer at NYU can find the address of another computer (e.g. www.apple.com or ftp.cornell.edu) and communicate with it.

The DNS database is used for the registration, deletion, updating and querying of networked computer systems and infrastructure devices. Until now, institutions managed their DNS services centrally, with all requests being manually serviced by their central hostmasters. There was no interface to facilitate the update of this database.

ACF has developed a new method to automate the administration of domain name system and bootp management for heterogeneous networked computer systems and infrastructure devices. The new design uses a client-server architecture to automate the database-management activity. Using the software we developed, based on this design principle, we are able to manage the name service of the complex and growing assemblage of over 15,000 University hosts from any host on the Internet with web-browsing capabilities. By distributing the DNS management functionality among trusted users along secure authorization paths, the new software significantly reduces the new host registration or modification time to virtually instantaneous, while saving ACF many hours of time-consuming manual input into the DNS and bootp databases.

The system design is accomplished in Perl, using a web-based front-end and a common gateway interface (CGI) for communication between the distributed client browsers and the centralized name servers. The key features of the new system are:

Distributed Design
The software distributes DNS and bootp management functions among designated site managers. It allows multiple simultaneous password-protected access to several administrators, while ensuring integrity with subdomain locking.

Service Improvements and Staff Savings
The automation of the activity dramatically improves the response time and preserves the integrity of the database, continued on page 45
Five years ago, a 14.4 Kbps modem was incredibly fast. It was like lightning compared to a 2400 baud modem. As stunning as this was, it wasn’t long before speeds went up to 28.8 Kbps then 33.6 Kbps. For a while, common wisdom held that 33.6 Kbps was as fast as a modem could get.

Then the protocol war started. Two parties found ways past the 33.6 limit — two significantly different ways. Modems with 56K emblazoned on their boxes arrived in stores. Unfortunately, these modems did not actually give you 56 Kbps connections. You might get close, but only if the phone lines running from your house to your phone company were very high quality; your Internet Service Provider used digital circuits to connect to the phone company; the modem you connected with at your ISP’s end was also 56K; and it ran the same protocol as your modem.

The first issue will remain a problem as long as there are copper telephone wires buried in the ground; the second and third issues are settling themselves as more and more ISPs upgrade their modems and telephone connections. Here at NYU, we are addressing the fourth issue as we migrate our modems to 56K capable models.

The two competing protocols on the market are x2 and K56flex. We feel that the K56flex protocol is unfortunately named, because it can be confused with the connection speed. K56flex refers to a particular method of packaging data so it can be transferred over telephone lines. 56K refers to the maximum data rate achievable, whether it is by the x2 method of packaging data or the K56flex method.

As long as it was unclear which side would win out, ACF chose not to commit to either protocol. An x2 modem couldn’t connect at the maximum rate to a K56flex modem, nor could a K56flex connect at the maximum to an x2.

Two developments led to our decision to upgrade our modems: the International Telecommunications Union (ITU) is expected to issue a standard for 56K communications early this year, and modem manufacturers have committed to issuing upgrades incorporating the new standard to existing customers.

The first step toward migrating the entire service to 56K modems was to upgrade one set of the DIAL service modems to K56flex protocol modems during the fall semester. This set of modems was monitored for compatibility with existing lower-speed modems and with x2 and K56flex 56K modems. People dialing in with modems ranging from 2400 baud to 33.6 Kbps made connections as they always had. Those dialing in with x2 protocol modems connected cleanly, though at a maximum rate of 33.6 Kbps.

Connections originating from K56flex modems attained significantly higher data rates. Due to the varying quality of the phone lines between the calling modem and ACF’s modems, these rates were not the full 56K possible under perfect conditions. On average, the connection speed from a K56flex modem to an upgraded ACF modem was 40K, though rates as high as 52K were recorded. The highest-rate connections were placed from newer, high-quality local loops. (A local loop is the connection from your phone to your phone company’s... continued on page 45
The Icon Project
Computing at the Institute of Fine Arts

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NYU’s Institute of Fine Arts houses one of the country’s most prestigious graduate programs in art history and archaeology. In support of the scholarship undertaken there, and under the care and jurisdiction of the Visual Resources Collections (VRC), the Institute has amassed a formidable assembly of images in all photographic formats practiced over the last century, including glass plate negatives, albumen prints, mounted and unmounted black and white photographs, lantern slides, 35mm slides, postcards, and now also digital records. Images are vital to art historical teaching and research; the discipline would not exist as we know it without them.

The Visual Resources Collections are used by students, faculty, museum curators, picture researchers and scholars from around the world to facilitate how excavations progress; the photos also list sources of published information on those objects or sites.

The three functions of research, presentation and illustration fall under the broad heading “Visual Documentation Research”; they are the heart of art history, in that they facilitate the analysis and study of art and permit its publication and dissemination. Images help resolve one of the biggest hindrances to the study of art history: the physical location of the art being studied. If the student can’t get to the art, the art is brought to the student, using images as stand-ins for the real thing.

Until very recently, visual documentation research was conducted completely manually, by

Figure 1: A typical workspace for an art historian: slides spilled out onto a lightbox.
spreading slides out on a light box or black and white prints on a table. Image manipulation as such did not exist, beyond the possibilities of physical rotation of prints or reversal of transparencies. Combining images, too, was impossible, short of pushing two projection screens together, or using tracing paper over a print, unless a researcher possessed advanced darkroom skills and a copy of the needed negative.

Photographic images, unfortunately, deteriorate most quickly in the environment in which they are also the most useful; the more students who wish to use the same photograph, the greater the chance that that photograph will be damaged in some way. The computer’s ability to transform an image, while preserving the original photographic copy, holds forth the possibility of developing new ways of looking at images, new ways of conducting art historical research, and new ways of maintaining the image collections integral to such research.

The Icon Project grew from a faculty member’s request to use a computer image database in a graduate seminar on Byzantine icons. The project seemed ideal for such an experiment: the number of images involved was rather small by our standards (between 500 and 750; classes on broader topics might require many thousands of images) and the number of published sources was limited. We already had most of the images required for the class in our collection of 35mm-format materials, so the initial step of assembling material for scanning was already complete.

The faculty member who made the request, Professor Thomas Mathews, was excited about the project despite the fact that he had never used a computer in this way before. His students were willing to contribute their time and effort to help build the database once we got started. There were several obstacles to overcome, however. Our department had no computers capable of reproducing images (we did not even have color monitors in 1995, when this project started); we had no software experience, no imaging experience, and no in-house technical support staff. In other words, we had to build the entire project from scratch in under a year, before January 1996, when his class was first scheduled to meet.

Having never undertaken such a project, the process was both confusing and daunting. Professor Mathews, Institute Director James R. McCredie and I previewed both commercially available and customized software without immediately finding a package that fit our needs. Off-the-shelf software was too broad, designed for more applications than we wished to make, and customized software was beyond our technical abilities.

In addition to the technical needs of the project, there were also staff constraints to accommodate. The staff of the VRC would be charged both with learning the new software and its applications quickly, and in teaching the software to a class of students who had varying levels of computer skills. We were looking for software that met our technical needs, but that was also close to self-explanatory, and therefore as easy to use and as easy to teach as possible.

We settled on Gallery Systems’ The Museum System software as best meeting our needs after seeing it in use at the Antonio Ratti Textile Center at the Metropolitan Museum. The Museum System (TMS) is a collections management package for text and images designed for use in museums; it includes field structures tailored to the needs of museum curators and registrars, allowing textual information from many offices and many
sources to be tied to specific objects.

The software incorporates a function called the Object Package, which lets users assemble subsets of the image database for personal reference. For us, the fact that many students could use the same image simultaneously was one of the greatest benefits of this software package. Also, because thumbnails and mid-resolution PhotoCD-formatted scans are held on the hard drive, rather than jukeboxed on CDs, image retrieval, especially of thumbnails, is incredibly fast. This enables our students to use the computer screen to browse through many images quickly, just as they would use a light box.

Once a software decision had been made, implementation management began. Decisions concerning service bureaus had to be made. We had neither the money to purchase scanning hardware, nor the staff time or expertise to learn how to use it. Consequently, we chose to send our 35mm slides (cleaned, numbered, and sorted into vertical and horizontal orientations) to an outside service bureau (DigiFilm, in Queens) for scanning to PhotoCD format.

Initial data entry consisted of keying the basic information about each object from its slide label into TMS. Vocabulary control (describing the images with consistent terms) was handled by one of the graduate students taking the seminar; for 10 to 20 hours a week during the course of the term, this student lent invaluable support and field expertise to the project.

One problem that arose almost immediately was scheduling. The VRC staff, attempting to work ahead of the class, requested that the class choose its images a week in advance of when they might actually be needed. Everyone in the class was used to working with a standing image resource, one that was immediately accessible, so we had to encourage them to plan ahead. The staff put in many hours of overtime, and our service bureau did our scans on 24-hour turnaround to keep up.

Questions of security also had to be addressed early in the process. Our limited budget was actually an advantage in this instance; since neither the VRC nor the Institute was networked in any way in 1995 (this is still the case; even now, only limited direct NYU-NET access is possible, and no LAN environment yet exists), it was decided to maintain the database on only one computer, kept in a secure area. Students wishing to make use of the database were required to schedule an appointment, and were closely monitored. Downloading in any format was not permitted; the database computer did not even have an attached printer. Since remote access was not possible and all users were known to the staff by sight, security ceased to be a concern.

Copyright, on the other hand, always troubles image curators, who are neither content-owners nor intellectual property lawyers. Again, our limited budget proved to be a blessing in disguise. We were not mounting the images to a website (beneficial as that might have been); the images were used only for face-to-face instruction, research and presentation, and were only accessible on-site on one computer. This situation seemed to keep us well within the four-step fair use strictures of the 1976 copyright laws — although it defeated any possibility that digitizing our collections would make them any easier to reach.

Once up and running, the Icon Project proved to be a useful tool. Students used the computer in class for presentation, in addition to conducting much of their research on it. Presentation proved somewhat difficult, since we had made no provisions for the hardware needed for data projection. The computer that

Figure 3: Clicking on a thumbnail in Figure 2 gives a full-screen image.
held the database was wheeled into and out of class every week, and the students clustered around the one available 17-inch monitor. We tried a VGA splitter and multiple monitors, borrowing a screen from the Stephen Chan Library at the IFA, but the dozen or so class participants were still forced to squint across the seminar table at much-too-small images.

Undaunted, the students anthropomorphized the computer, naming it and making it part of their class. Indeed, one of the truly unanticipated difficulties of the project lay in keeping the class focused on the study of Byzantine icons, rather than on how to use the computer.

The students who were most comfortable with computers before the class began made the best use of it this new context. The most able students quickly grasped the potential of image manipulation afforded by TMS, generating new images (using Adobe Photoshop and the high resolution scans of each object available on CD) and incorporating them into the database as related material. These students also used each available technology to its fullest benefit, capitalizing on what each does best: slides are still the medium of choice among art historians for crisp, bright still images for projection purposes, while nothing can compete with the manipulation possible using digital records of the same object.

The variety of manipulations available to the students participating in The Icon Project was staggering. Using TMS, students had access to point-and-click grayscale functions. Photoshop's color correction, rotation and tweaking tools made repair and conservation speculation possible. An issue for future consideration is the scholarly ethics of such manipulation; if database managers find it as easy to alter images as our Icon Project students did, care will have to be taken to ensure that altered images are labeled as such, and the integrity of the original object is preserved through its digital surrogate.

It would be unfair to conclude by leaving the impression that The Icon Project was an unqualified success, for it was not. Difficulties in scheduling, the lack of remote access, inadequate presentation hardware, and finite funding were balanced against the enthusiastic support of the staff of Gallery Systems (Jay Hoffman in particular, who was more or less on call to the project for several months), and the delight the students took in trying something new. Students have expressed an intense desire to see the IFA's entire image collection online, downloadable into papers and projects and accessible from remote sites.

The VRC has maintained the site license for TMS, and now has mounted the most recent upgrade, despite the fact that the networking of the IFA is still purely speculative. Other curators of image collections at NYU, most notably Kayla Stotzky of the collections at the College of Arts and Sciences, and Kathleen MacQueen of the collection at the Program in Art and Art Professions, are exploring ways of connecting their resources with the IFA and sharing cataloging data and images via NYU-NET.

Pressure from incoming students to provide avenues for online research and the application of new technologies in the classroom encourages the continued use of tools such as The Museum System. The potential effect on the discipline of art history, as the technologies for image databases become more widely used, is far-reaching and exciting.
The World Wide Web is fast becoming the first place researchers and the curious look when they need to find information quickly. For those with access, the Internet can open the door to a vast storehouse of knowledge. However, for the unwary, the Internet can lead to a maze of poorly-rendered and untrustworthy source material. In the field of history, this most often takes the form of transcriptions of historical documents (or portions of documents) loaded onto the Web without any indication of who has done the transcription, whether it has been proofread or changed, or if it has been excerpted. Sometimes the document is taken out of its original context.

In the case of research on Margaret Sanger, the founder of the American birth control movement, the search for accurate and reliable source material is further complicated by that fact that anti-abortion groups have taken to using Sanger and her words to tarnish the reputation of the current reproductive rights movement. This is generally done by taking selected Sanger statements (often just a few sentences from a multi-page document) and placing them on the Web as evidence of Sanger’s racism, anti-Semitism, pro-abortion stance, or some other polemical point the group mounting the website wishes to make. As a historical editing project striving to provide access to Sanger’s words, thoughts and deeds by accurately reproducing Sanger’s writings and speeches, the Margaret Sanger Papers Project has undertaken the production of an electronic edition that lives up to the same scholarly standards used for editions of historical documents in print and on microfilm.

The Margaret Sanger Papers Project (www.nyu.edu/projects/sanger), has been located at New York University’s History Department since 1987. Supported by grants from the National Historical Publications and Records Commission, the National Endowment for the Humanities and many private foundations, the Project has already published a two-part, 101-reel microfilm edition, containing over 54,000 documents. We are also preparing a printed guide and item-level index that will integrate our two parts with a third one: the 145 reels of additional Sanger material housed on microfilm at the Library of Congress. All three series are currently available to NYU researchers at Bobst Library. (For a list of other libraries which have purchased the microfilm, see the Margaret Sanger Papers website.) The Project is now working on the first volume of a three-volume book edition of selected, transcribed and annotated Sanger documents to be published by Indiana University Press.

Published editions of historical documents have for decades provided access to rare and fragile historical material. Print editions, such as the multi-volume Papers of Woodrow Wilson or Papers of Thomas Jefferson, offer carefully transcribed and annotated documents in editions that are available in libraries and schools across the country. More recently, historical editions have also been available on microfilm, such as The Papers of Susan B. Anthony and Elizabeth Cady Stanton (45 reels). Such edi-
tions allow many more users to have direct access to originals than was previously possible, though in a contextualized format with each document carefully identified (by author, recipient, date, etc.). The emergence of new digital technologies now offers even more possibilities for publishing historical editions.

Three models for digital editions have been identified: image editions, live-text editions and combined editions. All three editions provide users with retrieval and search tools as well as supplementary contextual material; the difference among them is in how the historical documents are presented. Image editions present original documents as facsimiles, so that the experience is much like viewing the original manuscript. Live-text editions present transcriptions of original documents whose text can be searched by the user. Combined editions offer both images and live-text transcriptions, so that users can search the text but also have access to the format of the original.

Because there are so many editions already in print, a fourth model, the transitional edition, has been identified as a means of providing access to already published volumes. Printed transcriptions can be searched via online indexes.

As useful as the Sanger microfilm and book editions are, we began to consider the option of publishing on the Internet several years ago. Our initial idea was to digitize all three Sanger microfilm series — over 115,000 documents. In so doing, readers would easily be able to view documents across the 246 microfilm reels, bypassing the fixed format of the three-series film. After scanning and digitizing the microfilm, our plan was to use the Project's already existing database program to link the documents to their identifying information.

Digitizing the entire microfilm proved to be prohibitively expensive, however, as each frame needed special handling to insure a clearly replicated digital image. More importantly, we realized that digitizing the existing microfilm edition would offer users faster and more convenient access to the documents, but not much else. We decided that if we were going to incur the expense of digitizing historical documents, we would want to take advantage of all the capabilities that the new medium had to offer.

We decided not to try to imitate our existing editions. Rather, we would create a wholly new type of historical edition. We would produce a series of small, topic-based electronic editions, each consisting of approximately 200 to 400 documents and each focusing on a major theme in Margaret Sanger's life.

Each edition contains images of the actual documents, surrounded by contextual information. The look of the electronic edition mirrors that of the microfilm: above each document is a descriptive "target" which identifies the author, recipient, document date, the location from which it was written, and the repository that holds the original. In addition, we added a list of individuals and organizations mentioned in each document. However, while the identifying targets on our microfilm edition are static (readers must consult the printed index to locate specific documents on the film), the electronic targets are active, allowing the reader to search them for related documents as well as supplementary information we provided. Users can now easily search the documents in a variety of ways: by the name of individual authors or recipients, by document type, by date, etc. For example, when users click on the name of the author of the document, they can access a short biography of the individual that includes the nature of their relationship with Margaret Sanger. The user can also obtain a list of all documents in the edition written by, written to or mentioning that individual. When a user clicks on the date, they can access a day-to-day chronology of what Sanger was doing and where she was at the time the document was written.

Documents in the electronic edition are not arranged in a fixed format. Instead, users may access them in any number of ways. Providing documents in this unstructured format allows readers to approach the material from a variety of perspectives. One can follow Sanger's development by looking at the material in chronological order, trace her relationship with a single individual by accessing documents by authors and recipients, or highlight the different positions she held in public and private by contrasting her published writings with her personal letters. The important difference here is that the reader, not the editor, is determining how the edition will be read. The flexibility and fluidity allow readers to make the
intellectual connections for themselves.

In 1990, we took our plan and joined the Model Editions Partnership (mep.clas.sc.edu), a consortium of historical editors and technical experts, funded by the National Historical Publications and Records Commission (www.nara.gov/nara/nhprc) to devise models for converting historical editions to electronic form. The Sanger model differed from most of the other samples in the Partnership because it was image-based rather than text-based, and because we included a good amount of supplementary material that had not appeared in our published editions, such as biographical essays on individuals mentioned in the documents.

The 200-page sample we prepared for the Model Editions Partnership documents Margaret Sanger’s 1914 publication of The Woman Rebel, a feminist journal advocating birth control and radical reform. The model prepared for the Partnership will be expanded by the Sanger Project to constitute the first in its electronic edition series. Margaret Sanger and the Founding of the Birth Control Movement will not only include documents dealing with The Woman Rebel, but will continue the story to cover Sanger’s founding of the Brownsville clinic in 1916 and the formation of a national movement by 1921.

From the start, the Partnership has been committed to creating digital editions in a standardized format that would be independent of commercial software products. This would ensure that the data would be transferable, should delivery systems or software change. For electronic text, this meant using the Standard Generalized Markup Language, or SGML. Because we were dealing with historical documents, the Partnership decided to create a subset of SGML designed specifically for scholarly humanities texts.

The tagging structure of the Model Editions Partnership has been designed to use both descriptive and formatting tags that specifically address the needs and problems of historical editors. With formatting tags, editors identify the framework of the document (document headers, signatures, and postscripts) and signal the ways in which text is physically rendered (strikeouts, interlineations, and margin notes). Descriptive tags are used to classify words found in the documents. For example, different tags would be used for different types of names, such as names of people versus names of places. This will allow users to search for the person “Washington” without having to wade through every instance in the edition in which a city, street or business of that name is mentioned.

Because the Sanger sample uses images rather than transcriptions of the documents, our problems were somewhat different from those of the other partner projects. In the Sanger edition, the “text” to be tagged is not the actual words written by Sanger and her contemporaries, but the editorial material we have created to identify and contextualize the edition by the Project editors. Thus, we did not need many of the elaborate textual tags used by other editions, such as those used to render interlinearations or changes in a document through various drafts. As a result, the Sanger sample was initially seen as the simplest of the model editions. Compared to the other editions, it contained very little actual text to be tagged—just the targets, biographical essays and topic essays—since our edition relied upon links between documents to provide context. However, in the actual work of tagging and testing the samples, our sample has turned out to be the most complicated of the seven. Most of the problems came about because the software currently available to display SGML text is not as powerful at linking discrete documents as HTML browsers are. Thus, over 20,000 tags were needed to describe and link the documents together.

The experience of creating an electronic edition has changed the way we think about publishing historical material. By exploring the relationships between the documents in our edition, highlighting the individuals mentioned in each document, and creating links between them and the documents, we have come to a deeper understanding of Margaret Sanger’s world in 1914, the network of individuals with whom she associated, the development of her political thought, and the intersection of her public and private life. We believe that researchers using this electronic edition will be able to use these primary sources in a much more fluid manner, which will encourage more original thinking and interpretation.

We continue to refine the Sanger Project’s model edition. Once it is completed, a sample will be available on the Project’s website at www.nyu.edu/projects/sanger.
New Statistical Software

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Six weeks into the semester, a graduate student entered my office at ACF. "I'm having trouble running a t-test using SPSS." She showed me her data, a dataset her Research Methods II professor had put out on our servers for the students to use.

"What groups are you comparing?" I asked. "What is your grouping variable?" She didn't know what I was talking about.

"Perhaps you should read your stats book ... or meet with your professor." It was Friday afternoon, 2:30. Her assignment was due on Monday and she was not feeling good about her situation. How could I help her?

I had been reviewing ActivStats, a new instructional CD-ROM from a Cornell professor, Paul Velleman. I considered setting her up on it. It would be a first for me, but I try to be flexible. As if we do this with students all the time, I popped Velleman's ActivStats CD into a Pentium in the next office, and she started clicking away.

For the rest of the afternoon, I could hear Velleman's voice cheerfully going on and on. He was tireless, unaffected by her repeatedly asking him to explain which variables in the spreadsheet were categorical, which were quantitative and what that had to do with a t-test. Before I left, she came back into my office. I showed her how to run the test in SPSS. Happy ending, courtesy of Paul Velleman.

I knew Paul Velleman soon after he had studied with Professor John Tukey at Princeton, almost 20 years ago. As a young statistics professor at Cornell's Industrial Relations School, he helped develop modules for Minitab, one of the first interactive statistical packages available. It ran on mainframe IBM computers using paper teletype terminals. He helped write Minitab's stem-leaf and other robust statistical procedures. He went on to create DataDesk, the full-function statistical package which is used in the ActivStats CD-ROM.

ActivStats is an introductory multimedia statistics course. It builds a context for statistical work and prepares the student for the Advanced Placement Statistics Exam. ActivStats uses video, simulation, animation and narration. It is loaded with material from leading textbooks, and has the functionality to allow a teacher to insert her own text and examples. It uses interactive experiments to develop datasets. For example, students use the mouse to "shoot" at a target to develop a dataset, first with the right hand and then with the left. This creates two groups of data, right hand shots versus left hand shots, for the t-test. We compare the average distance from the target's center for each group.

Homework and quizzes follow each chapter. Homework is done within DataDesk, or the student can use the package of the teacher's choosing.

I used to say that, without preparation, I could teach a good statistics course by assigning the Minitab book and telling the students to sit at a computer and follow the book. Now, I'll say that I would assign Velleman's ActivStats CD.

Addison-Wesley distributes the CD for about $80, with a discount for students. See their website, www.awi.aw.com, for more information.
Release 5 of SuperCooled Stata has been installed at the Tisch Hall ACF computer lab located in room LC8. This is an established statistical package which offers a full range of data management and statistical procedures. The package has certain important advanced statistical procedures not found elsewhere.

Stata has powerful data manipulation and management features such as a full set of numeric and string functions, I/O procedures, appending and merging tools. Since it has full data dictionary functions such as labels and report writing, it is often used as an archive management package.

Stata has a complete matrix language suitable for teaching. It warns that general tools shouldn’t be developed because of limitations in dataset size. For advanced programming, the macro language features a large tool chest. This programming language includes the usual commands such as “if” and “while,” but advances past SPSS into program debugging, parsing of program arguments and advanced window control to create dialogue boxes and menus.

In the usual mode of operation, Stata has windows for output and a spreadsheet-like data editor. Unfortunately, on the PC these windows function differently than they do in most other Windows-based applications. For example, the output window doesn’t have a scroll bar to allow the user to scroll the window forward and back. Also, the little “x” in the upper right-hand corner of the data editor doesn’t close the window, as it does in most Windows applications. Instead, clicking on it saves the data, exits data editing and brings you to the command prompt, which can be alarming if you simply wanted to close the window. This proprietary window functionality is also a fault of SAS.

Although Stata operates in a Windows environment, it also functions by entering commands at the command prompt. It does not have pull-down menus for statistical procedures or for data management.

A version with slightly limited functionality is also available for students. The student version doesn’t allow the user to print the graphs produced. Also, it limits datasets to 25 variables and 160 observations. As it runs in DOS, tasks are performed by typing at the prompt. Despite this, the student version is popular, and is available for about $34. Order from their website at www.stata.com.

Stata makes full use of the Internet. The group offers Net-Courses — pay lectures with e-mail responses to questions. Lectures cover Stata techniques and various statistical courses, and involve the participant in a student/teacher dialogue. The cost is about $20 per week. The company’s website has many FAQ (Frequently Asked Questions) pages, and the Stata listserv includes useful tutorials.

Stata is the third most often mentioned statistical package, after SAS and SPSS, in circles where such things are discussed. It has an established following. Macintosh, PC and Unix versions are available.

### SUMMER PROGRAMS IN STATISTICAL MODELING

New York University is a founding member of the Inter-University Consortium for Political and Social Research (ICPSR). The Institute, located on the Ann Arbor campus of the University of Michigan, has many federal, state and private contracts to archive and distribute social science data. For fifty years, social scientists have come to the Institute to teach and to learn.

The ICPSR has a summer program in quantitative methods. Small stipends are awarded to researchers and graduate students applying through ACF’s Statistics Group. Courses are offered in basic and advanced research design, statistics, data analysis, and social methodology. Program lengths vary. This past summer, three graduate students from NYU attended.

Browse the ICPSR website (www.isr.umich.edu) for information on their summer program. If you would like to apply, contact the ACF Statistics group at lopresti@nyu.edu.

— Frank LoPresti
Researchers who conduct studies in which participants are tested before and after a treatment have a legal and ethical need to preserve the participants' anonymity. How can we ask people to participate in a two-test process without compromising their privacy? Of course, we want to match the initial test to the follow-up test to get the strongest statistical power, so at some point we must know the names of the respondents.

Most researchers handle this data collection problem by numbering the tests – giving identical numbers to the pre-test and post-test documents of each participant – and keeping some “master list” with names matched to questionnaire I.D. numbers. The master list is kept secure by the researcher in a separate location from the pre-tests. After the post-test is administered to the group, the list is destroyed, the matching tests are paired and the respondents remain anonymous.

I was recently involved in testing several thousand children in the NYC public school system who were participating in a violence prevention effort called “The Leadership Program.” The in-school program, conducted by a not-for-profit community agency, would span two months.

**The Privacy Problem**

Since special program money is tight, school boards are demanding more accountability. Testing is becoming more and more important. Nevertheless, the budget was small. The tests were to be administered in the classroom. Twenty different schools were involved. Developing a master list would clearly be a difficult and expensive task, because people must be hired to be responsible for the lists, who would also travel to the schools and administer the tests.

The trainers, unfortunately, were a diverse group of part-time actors. They were good with the children, but were difficult to manage from a central location since they resisted administrative tasks.

We could not involve the teachers in keeping a secure ID/names list, as the students’ privacy might be compromised.

In the previous year, to avoid creating a master list, the program designers tried an innovative idea. They asked the children for shoe size, number of siblings, age, gender and other information which, when combined, might make matching possible. Responses like “My sneaker size is 6 but my dress shoe size is 5,” and “I have two brothers, and sometimes two half-sisters,” lead to a match rate of about one in ten, with lots of uncertainty on the accuracy of the matches.

**Our New Method of Administering Tests**

Pairs of questionnaires with the same IDs were handed out. Each child answered the pre-test and wrote his or her name on an envelope containing the post-test. The pre-tests were collected by the trainers and returned to the program office. The as-yet unanswered post-tests, in their envelopes, were kept at the schools.

Two months later, the envelopes were distributed to the children, who threw away the envelopes with their names on them and filled out the questionnaires inside. The school authorities were satisfied that privacy was maintained, and the matching rate was wonderful.

I welcome any feedback readers may have on this new method. Please e-mail comments to frank.lopresti@nyu.edu.
Recent Developments in Color Management

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As desktop computing technology has matured, artists and publishers, as well as media non-professionals, have been offered easy-to-use tools for scanning, manipulating, and printing color imagery. All too often, however, the results exhibit disappointing hue shifts, fading, darkening, or other color distortions relative to the original source.

The practice of maintaining color fidelity from scan to display to print or film output is referred to as color management. Color management on desktop computers has significantly evolved since last reported on in the November 1993 issue of Connect.

This article provides an introduction to the issues, industry solutions, and theoretical basis for color management. A second article in the next issue of Connect will present specific practical steps one can take to implement color management.

Philip Galanter is Associate Director for Arts Technology at ACF.

The Problem

It's natural to want to use color in a computer-mediated process. Color is an aesthetic enhancement which also adds useful information. Upon closer inspection, however, it is remarkable that real-world color can pass through a digital pipeline with any recognizable fidelity at all. There are numerous complications due to color gamuts, illuminants, colorants, ambient lighting and context.

A given range of color is referred to as a color gamut or simply a gamut. The human visual system supports a very wide color gamut. While various digital devices may surpass the resolution of human vision in terms of discriminating between small details, they typically exhibit a more limited color gamut. As shown in the diagram on page 37, photographic film and computer monitors offer only a subset of the colors available to the human visual system, and the colors offered by process printing are even more limited.

Additional complications include differences between illuminants, such as indirect light reflected off a page versus the direct light from a monitor. Various colorants such as ink, dye, wax and toner exhibit spectral differences which make an exact match impossible. The same object will appear to have a different color if there are changes in the ambient lighting created by the room lights and reflections in the surrounding environment, or in the perceptual context of the colors in nearby objects.

The Solution

Color management today provides a strong partial solution to most of these problems. The first step is to calibrate devices used in the production. Over time, a component will drift somewhat in its color response, and calibration is intended to return the device to its design specification tolerances. Next, a hardware device called a colorimeter is used to measure and capture as data the absolute color response of the individual device. This information is encapsulated as a file in a standard format called an ICC Profile. For example, two monitors of the same brand and model will be calibrated to the same specification, but each monitor should be measured with a colorimeter to generate its own unique custom profile.

Next, a software-based Color Management System (CMS) is used along with the profiles of the devices involved to match colors...
which are within the gamut of both devices, map colors which are out of gamut to within the gamut of later devices, convert color information from one system to another, and preview colors by using a monitor or printer to simulate the color-look of the final output device.

For example, scanners measure colors as a mix of red, green and blue light (RGB), while printers typically layer a mix of Cyan, Magenta, Yellow and black ink (CMYK). The color management system will use a scanner and printer profile to convert a scanned RGB image to a CMYK print in a way that is closely tailored to those two physical devices.

The CMS can use a third profile for a draft-quality proofing device to simulate what the colors will look like when they are sent to the final printer. A calibrated and profiled monitor can be controlled by the CMS to simulate the look of the printer. The CMS in this case will limit the visual range of the monitor. While this will seem to make the monitor appear degraded, this is in fact what is needed so that "what you see" on the monitor is "what you get" from the printer.

**Color Management Standards and Products**

Prior to 1993, every vendor of color management tools worked independently, and a number of competing application programs were available from companies such as Kodak, AGFA, EFI, Candela and others. There was little in the way of interoperability, and no clear winners or de facto standards.

In 1993, Apple introduced ColorSync 1.0, a unified operating system-level CMS. Unfortunately, the software at its core, the Color Transform Engine (CTE), was slow and produced inferior color separations. In addition, ColorSync 1.0 was not supported by any major applications. The basic concept of operating system support for color management, however, gained interest and attention.

Apple released ColorSync 2.0, a greatly improved CMS, in 1995. As its engine, ColorSync 2.0 used the LinoColor CTE, a leading, expensive, software product licensed from Linotronic and then bundled into the Mac OS. Not only did this greatly improve the quality of ColorSync transformations, it also radically improved system performance. For example, a color space conversion of a 20 MB image that took 30 minutes in ColorSync 1.0 takes only 5 seconds in ColorSync 2.0.

The second significant improvement ColorSync 2.0 introduced was the use of an industry standard profile format. Apple developed the format, and then formed the International Color Consortium (ICC) along with Adobe, AGFA, Kodak, Microsoft, Silicon Graphics, Sun and Taligent to help ensure industry-wide adoption. The ICC Profile Format is the catalyst that created the current color management industry, and allows multiple vendors to create interoperable scanners, printers, monitors, calibration and spectral measurement devices, application software and more.

In the first quarter of 1998, Apple plans to roll out ColorSync 2.5, a major revision to the current version 2.1. ColorSync 2.5 will support multiple simultaneous color transform engines, and will ship with both the LinoColor and Kodak CTE. This allows the user to choose which CTE he prefers, and to take advantage of private data fields which can yield small improvements when the profile and the CTE are from the same vendor. In addition, ColorSync 2.5 will include tools for profile library management, built-in software calibration and monitor profiling, multi-processor support, and AppleScript support for batch conversion of multiple image files.

Microsoft color management tools for Intel platforms are not yet a practical alternative. Windows 95 does include an ICC-based CMS called Image Color Management (ICM) 1.0. Unfortunately, it uses a low quality CTE based on an earlier proprietary system from Kodak, is not currently supported by available applications, and requires specially created print drivers to apply device profiles.

In mid-1998, Microsoft is expected to release ICM 2.0 as part of Windows 98 and Windows NT 5.0. This will include the same LinoColor CTE Apple adopted in 1995, and should allow the use of the same ICC standard profiles used by ColorSync. It remains to be seen, however, how broadly and quickly Windows applications will be revised to take advantage of ICM 2.0. In addition, Microsoft and Hewlett Packard have been promoting a color space definition called sRGB which is primarily oriented towards the consistent monitor display of web applications. Having both ICM and sRGB may cause confusion and slow the adoption of either by software and hardware vendors.
Looking Under the Hood — Color Specification

A fundamental aspect of color management is color specification. Within a typical 24-bit color application, 256 levels of red, blue and green each are represented by 8 bits per primary color. While this allows for an RGB color space with “millions” of colors, there is no particular absolute real-world color defined or intended for a given set of values. The 24-bit RGB colors are simply relative values, and each will be rendered in a way which is specific to the given device. The same is true of images in a CMYK color space, and so both RGB and CMYK are referred to as “device specific.”

In 1931, the CIE (Commission Internationale de L’Eclairage, or International Commission on Illumination) defined a set of device-independent color spaces. First, based on a number of experimental trials with human subjects, tristimulus values called X, Y and Z were defined based on the three types of stimuli the eye detects. This CIE XYZ space includes all visible light where X, Y and Z can range from zero to just over 100 percent. The CIE Yxy space is a simple mathematical transform of the XYZ space, and in both cases the Y component corresponds to the lightness (closeness to white) of the color. The problem with the XYZ and Yxy spaces is that they are nonlinear relative to human perception. That is, XYZ and Yxy values that are close may or may not appear visually close as colors. The CIE L*a*b*, or simply CIELAB, space corrects for this nonlinearity, so that throughout the space any given distance corresponds visually to about the same color difference. It is said to be perceptually linear.

CIELAB is the interchange color space that a CMS uses internally for all color transformation calculations. Device profiles provide the CMS with the information it needs to convert between the device-independent CIELAB and the device-specific RGB or CMYK values. For example, a scan is made yielding RGB data for the image. The CMS uses the profile for that particular scanner to convert from RGB to CIELAB. It then uses the profile for the particular printer being used to convert from CIELAB to CMYK. That CMYK data will print with color fidelity on that particular printer and no other.

In the print industry there is another form of device-independent color. Proprietary spot color systems such as those from Pantone, Trumatch and AGFA use carefully controlled proportions of 14 or more inks to create color matching samples and standardized printing supplies. Because so many inks are used, the spot color gamut is much wider than the typical CMYK process color gamut.

For example, typical CMYK printing can only match about 30 percent of the available Pantone colors. An extended print process called Hexachrome uses six inks and can match up to about 80 percent of the Pantone colors.

Practical Steps

The practical steps towards color management include calibrating monitors, using generic profiles, creating and using custom profiles, and using the color management system to simulate final output devices on the computer monitor or with a less expensive printer. Those working only with graphics for the Web may find that monitor calibration is sufficient. Others, such as those working in a pre-press capacity, will need to find their own combination of options based on their workflow and quality expectations. In the next issue of Connect we will explore these options in practical detail.

A comparison of color gamuts in the CIE XYZ color space.
Streaming Media

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Point, click, wait ... This is how viewing or hearing art on the Internet always seems to go. Why does it have to be so slow? In order for you to see or hear a piece of artwork, your browser must wait until the entire file arrives at your computer before it can be displayed or played. This makes sense for a large image or a complex website. But why wait so long for time-based artwork like video and audio? Why not start playing the beginning while the later parts continue to arrive at your computer? Sound like a good idea? It is. It's the basic concept behind streaming media.

Quality Control

Before you go ahead and stream your new feature film, though, you will first need to consider the limitations of putting video and audio into a digital format. Video quality is determined by frame rate, frame size and compression type; audio quality is determined by sampling frequency, word length and compression type. The settings that you choose for these elements should depend on how your work will be seen or heard.

Streaming video looks good at frame rates starting at about 10 frames per second. This means that the movement will appear smooth, without any of the jerkiness associated with slower frame rates. In order to get a higher frame rate, you will have to sacrifice image size. The smallest image size is typically 240 pixels wide by 160 pixels high, or about three inches by two inches. Would you sit and watch a one- or two-hour movie on a two-inch by three-inch screen?

If you have the RealPlayer from RealNetworks (available at www.real.com), you can view an example of a full-length movie on a small screen: a recording of the keynote address from Educom '97, is at www.educom.edu/conf/97/contents.html.

I tried to watch these broadcasts on a very fast Silicon Graphics workstation. Despite the superior hardware I had available to me, I was disappointed in the output, because I was using streaming media as a substitute for broadcast television. I felt that it didn't deliver a satisfactory viewing experience.

But streaming media is not television and it's not radio. It's a whole new medium that bears a strong resemblance to broadcast television. Because of these similarities, we want to force streaming media into molds that current technology cannot support. As the technology advances, we will be able to support broadcast-quality television and radio for all Internet viewers.

Audio quality is determined primarily by sampling frequency. A minimum rate for video with audio would be mono at 10 Khz. Any less, and the audio quality becomes very poor. Audio without video streams much better; you can get transfer rates close to that of a CD.

On the practical side, there are a number of techniques that can be used to control the quality of your final presentation. The most important is the quality of the original material.

Noise does not compress well. This is true in audio as well as in video. Compression is based on analyzing the source material for similar and repetitive sections. These sections can then be reduced to simpler but identifiable reproductions of the original material. Keep in mind that

Jeff Bary integrates art and networks as a senior member of the Arts Technology Group at ACF.
almost all of these compression schemes discard information from the original. This effect is called "lossy," because information is lost and cannot be recreated.

Reaching Your Audience

When your work is going on the Internet, you need to predict what kind of connection the majority of your audience has. If you are delivering your stream to computers directly connected to the NYU network, you will be able to deliver very high quality audio and video, perhaps approaching broadcast quality. Viewers who are connected with a lower-speed modem will not be able to receive a high-quality output, and a different format might serve them better.

To avoid this guesswork, you can store your piece in several different formats, so the viewer can choose the appropriate version for his or her connection speed. Some types of media allow you to provide the same piece in several different formats. The player software then requests the proper version to play, depending on the connection speed, browser and server.

This requires an understanding of how web pages and media files are distributed on the Internet. There are two popular methods in use today for sending media to your browser program.

The first is the same way that all web pages and inline graphics are provided. Normally, web pages and graphics are requested by your browser from the HTTP server on a network computer. These are stored as files on that computer along with all the other web page and graphics files. When you click on a link to request a media file, the web server locates and sends the file containing an HTML, movie or audio file.

This works great for web pages, but not for streaming media. The web server merely starts sending the file as fast as it can until it has sent the entire file. The viewer has no control. It is not an interactive experience because you cannot stop, start or restart the piece.

There are several choices for this all-at-once method. The most popular are video files in QuickTime or AVI format. Audio has a number of formats: AU, WAVE, AIFF or QuickTime. QuickTime is supported on both Apple Macintosh and Windows platforms. Both QuickTime and AVI can have audio tracks without video and can be used as audio-only media. QuickTime can be made to stream even when sent from a web server rather than from a special server.

The second method is to use a proprietary streaming media server and custom player software. The server stores information about the media, usually the name of the streaming media server that the media file is on and the name of the file on that streaming media server. The web server sends that information to your browser. In turn, your browser passes this to a helper application, which in this case is the player. The player then makes a request to the streaming media server for that specific file.

A streaming media server is different from a web server in that it has the ability to listen to requests from the player program to control the playback of the media. These allow the player to act more like the controls on a tape player or VCR - Stop, Pause, Play, Rewind, Fast Forward.

There are also a number of different methods for delivering streaming media. Some of the newer ones are Java-based, and some require additional separate players. In all cases the original media must be compressed and translated into the format for that player or server.

The Arts Technology Group of ACF currently operates two different types of proprietary streaming servers: RealMedia from RealNetworks, and Mediabase from Silicon Graphics. These servers are still experimental, so the format, availability and support change often. If you would like to put material on them, a member of the Arts faculty will have to request it for you. Please visit the Arts Technology Group Streaming Media website at www.nyu.edu/agt/media for current information and examples of material from this article.

The Arts Technology Group (www.nyu.edu/agt) of ACF currently runs two streaming media servers. There is a tremendous amount of documentation on the Internet about streaming media. Go to the ATG Streaming Media site at www.nyu.edu/agt/media for links to these sites and examples of the techniques described in this article. In addition, we provide online gallery space to artists at NYU. Contact the author at jeffrey.bary@nyu.edu for more information on using these resources.
The Internet promises to dramatically redefine the basic means of communication and interaction in our society. E-mail offers a cheap and easy way to send important, timely messages, creating far-flung networks of friends, clients and colleagues that never could have existed previously. At the same time, the opportunities for free speech offered by the Web have taken the desktop publishing revolution of the 1980s to a new level.

Yahoo! Internet Life magazine recently ranked NYU as one of the most “wired” campuses in the country. Greenwich Village’s proximity to the new media companies of Broadway’s “Silicon Alley” has made the Internet an important part of daily life for everyone, from the professor of economics to the undergraduate majoring in art history. The phrase “I’ll e-mail you” has become commonplace this year as NYU-NET blooms to embrace the entire student body, both at school and at home.

Yet in the city outside the university community, and particularly outside Manhattan, on-ramps to the Internet are just slightly more frequent than on-ramps to the Brooklyn-Queens Expressway. However, unlike the arrival of highways, which split and destroyed dozens of vibrant neighborhoods like Williamsburg, Sunset Park and Tremont Park, it is the very absence of infrastructure and knowledge of the Internet that threatens to leave many communities behind in the 21st century.

Community Networks and FreeNets in New York

New York’s accomplishments in the 1990s have made it America’s number-one hometown; in a recent survey, people from across the country chose New York over all other cities as the place they’d most like to live. Yet despite the well-publicized drop in violent crime and the “Miracle on Wall Street,” the city is beset by chronic unemployment (hovering around 10 percent — twice the national average), a barely functioning school system, and a shortage of computer-literate workers. Community computer networks — message systems, networks of websites, online chat services — offer a chance to address all three of these problems, yet they are far less developed in New York than in other cities and regions.

Just what is a community network, and why are advocates so adamant about its ability to help disadvantaged groups help themselves? Doug Schuler, a pioneer in community networking and author of New Community Networks: Wired for Change (ACM Press, 1996), says, “Community networks are not designed to be on-ramps to the Internet, as this metaphor implies that the purpose of the system is to help people escape from their local community.”

To Schuler and others, the greatest need that FreeNets and community networks serve is to facilitate communication in neighborhoods, housing projects and communities where people have become isolated due to high unemployment, discrimination, language differences or crime.

New York City lags far behind other cities in the degree to which it has developed community networks, despite the rapidly
Growing new media industry, the many philanthropic foundations headquartered here, and the city’s vibrant and hard-working non-profit community.

Several efforts over the years, including BigAppleNet and the East Side House FreeNet, failed to develop into the kind of feasible low-cost alternatives to the commercial Internet Service Providers that dot cities across the nation. The FreeNet in Austin, Texas, a city with barely one-tenth the population of New York, has over 7,000 users served by more than 200 volunteers. Even in Los Angeles, which is fast becoming a place where the rich avoid the problems of the poor with gated communities and private security forces, activists have established a FreeNet with thousands of users throughout the city.

Several isolated groups are demonstrating excellent programs around the Big Apple to diffuse technology and knowledge throughout the entire city. The University Settlement House on the Lower East Side of Manhattan has a new computer lab and an extensive schedule of classes and workshops for its clients, providing job training and English skills simultaneously. Other groups, including Playing to Win, Chocolate Chips, and Urban Technologies, Inc., are developing models for neighborhood computer centers, yet funding for citywide expansion has been slow to materialize.

"Show Me the Money!"

The greatest obstacles to developing FreeNet systems in New York are a lack of financing and a shortage of civic-minded information technology professionals like those who have sustained the community networking movement in Silicon Valley, Seattle and San Francisco.

As the New York Times reported in a recent article (“Washington Hears Testimonials on Program to Connect the Masses,” Oct. 29, 1997), the federal government supports the development of programs aimed at connecting disadvantaged communities to the growing web of digital communications networks. According to the article, this program is not only the most competitive grants program in the federal government, but it also carries the heavily anti-urban bias of all federal programs. Dubbed the Telecommunications and Information Infrastructure Assistance Program (TIIAP), one of the program’s main goals is to help overcome geographic barriers to telecommunications access—putting urban New York’s applicants at a disadvantage compared to those in less densely populated areas. Few in Congress realize that poor inner-city residents have about as much access to advanced telecommunications as the Unabomber sitting in his Montana shack in the woods.

Philanthropic foundations, of which New York boasts the largest array in the nation, have failed to fill this funding gap for community networks. In fact, the non-profit community nationwide has lagged far behind business and even government in providing services and information electronically via the Web. In New York, skepticism about the merits of the electronic media, combined with decades of intellectual stagnation among major private grant-making organizations, have left start-up FreeNets and community networks starving for cash. The economics of computer facilities also defy traditional funding logic; the cost of physical equipment, which grantors prefer paying for over salaries and operating costs, are typically less than 15 percent of the annual budget of a computer lab with full Internet access. The real expense is in training, staff and telecommunications charges—soft expenses in the nonprofit world which leave little concrete evidence to show in foundations’ annual reports.

One need only look at the recently announced Web Development Fund program to get a sense of how far behind other cities and states New York is in funding technology and telecommunications projects of a community nature. Envisioned by Marc Weiss, creator of the popular PBS series “P.O.V.,” the fund gives grants of up to $50,000 for websites exploring specific social or political issues. With any luck, a small amount of this modest program will be used for community-oriented projects. In contrast, the Saint Vincent Hospital in Billings recently won a whopping $465,000 TIIAP grant to explore telemedicine in rural Montana.

An Investment in Our Future

New York’s future rests on the capacity of its workforce to understand and use information and telecommunications technology. Without community networks and the assistance of computer professionals, civic-minded citizens and philanthropic foundations, we risk raising a generation of young...
The process of searching for useful information on the Internet can be frustrating and time-consuming. How many of us have lost heart slogging through hundreds of web pages returned from a typical search, hoping to find that one precious nugget, that one elusive statistic, only to discover that none of the sites contains the information we really need?

In late 1995, Bobst Library began adding Internet resources to BobCat, the library’s online catalog. BobCatPlus, the new web search interface to BobCat, contains a growing collection of networked resources such as electronic texts and journals, government documents, online reference tools and organizational home pages. This “digital library” is part of a larger project at NYU Libraries, funded over the past three years by the Andrew W. Mellon Foundation, which seeks to develop a fully integrated multimedia information system, with BobCatPlus as the delivery tool.

Librarian subject specialists have evaluated resources and selected for cataloguing only those that they believe will prove most useful to the NYU community for study, teaching and research. The selection process is very similar to the one used for choosing books and other materials for the collection. Subject specialists ask themselves:

- Is the resource archived?
- Is it created and maintained here at NYU?
- Who is the creator or publisher?
- How stable is the site likely to be?
- Is the site well-organized and easy to use?
- Are the contents likely to be of value to researchers?
- Are the contents of a scholarly nature?

The evaluation process ensures that researchers can expect to find sites that are well-designed, relatively reliable and potentially useful.

Christopher Lowden is Bobst Library’s Electronic Resources Cataloguer.
The Labyrinth [computer file] : resources for medieval studies / [Martin Irvine and Deborah Everhart, co-directors].

Resources for medieval studies

Washington, D.C. : Dept. of English, Georgetown University, [199-?].

Title from home page.

"Sponsored by Georgetown University."

Includes bibliographical references.

System requirements: Internet access, World-Wide Web browser.


"The Labyrinth is a global information network providing free, organized access to electronic resources in medieval studies ... The Labyrinth's easy-to-use menus and hypertext links provide automatic connections to databases, services, and electronic texts on other servers around the world ... In addition, the Labyrinth will include a full range of new resources: an electronic library, on-line forums, professional directories and news, on-line bibliographies, an on-line 'university' of teachers and scholars available for electronic conferencing, and an archive of pedagogical tools ..."--Project description.

Middle ages--Databases.

Middle ages--Information services.

Middle ages--Study and teaching.

Mellon Project.

Irvine, Martin.

Everhart, Deborah.

http://www.georgetown.edu/labyrinth/labyrinth-home.html

 Ryu "

NYU Internet BobCatPlus Z5579.5 .W45 1990

Electronic Access

Not Checked Out

Figure 1: A complete description of The Labyrinth, a website resource for medieval studies, in BobCatPlus.
vides the resource. The “system requirements” and “mode of access” in the Notes field identify the access method and any special hardware or software needed to use the resource. The Summary field provides a description taken from within the site itself; this can be especially useful for judging the site’s relevance to a given query.

The Subject headings assigned are the same ones used to provide subject access to materials in the library’s own collection; thus a subject search on “Middle Ages” will group the Labyrinth site together with all other materials on this topic. The Electronic Access field provides a URL that indicates the item’s location on the Web, in much the same way that a traditional call number leads to the appropriate physical location of a book or journal. Users of BobCatPlus can connect directly to the site with a click of the mouse (Figure 2).

Currently there are more than 650 Internet sites catalogued and available through BobCatPlus. Librarians are monitoring the sites they select and reporting bad or missing links for updating, an inevitable situation given the volatility of the Internet. There is little empirical data available on the stability of Internet resources. A 1996 study by a private consulting firm on approximately 1,000 websites found that only ten percent of the “root” server addresses changed over an eight month period. That figure would probably compare very favorably with the “hit rate” for availability of books and other items in most circulating libraries’ collections.

BobCatPlus has the potential to serve as a gateway to many kinds of digital information, including resources produced and mounted locally. For example, the catalog record for a book or journal could link to a table of contents scanned into electronic form. With archival collections, catalog users could move from a broad description of the entire collection to an electronic finding aid, and from there could search for individual pieces of that collection — manuscripts, photographs, etc. — that had been converted into digital form. Working with this model, the Special Collections department at Bobst is currently scanning materials from the Tamiment/Wagner, Fales, and University Archives collections, and is creating electronic finding aids using SGML, or Standard Generalized Markup Language, to enable users to navigate within these “virtual” collections. Finally, the catalog might link to other locally produced and mounted resources, including multimedia and image databases.

NYU’s efforts are taking place within the global framework of an evolving “digital library”. On a national level, there are several initiatives under way in the library and information communities to develop new models for accessing and using metadata (literally, “data about data”). One such initiative, known as the Dublin Core, is envisioned as a standard set of descriptive elements that the creators of networked information resources would supply along with the resource itself. Search engines could then use Dublin Core records to enable much more effective searching and retrieval than is currently possible over the Internet. Other initiatives are underway in the computer science communities to define unique identifiers for digital objects, much like the current ISBN system for books. A search engine could conceivably use this “Uniform Resource Identifier” to find the location of a digital object, no matter where it resides on the network.

Much more work needs to be done before these initiatives are implemented on a national or international level. However, many see the selection and cataloging of Internet resources as the first step in the eventual transformation of the library catalog from a record of local holdings into a gateway to all kinds of networked information. In the meantime, BobCatPlus is enabling researchers to quickly identify, evaluate and access Internet resources.
DNS continued from p. 23

eliminating any manual errors. There are savings for the university in the productive labor costs of an expert in the areas of host name creation or alteration and network trouble-shooting and problem-solving. This is significant as experts can be redeployed from routine maintenance to more demanding and complex tasks.

Web Interface

The web interface provides universal access capabilities.

Security

The software enforces strict security based on subdomain partitioning and restricted authorization domains for designated users. The authentication groups and associated privileges differ for different classes of users.

Fault Tolerance and Non-Determinism

The engine is designed to ensure robustness and has the ability to retreat to a previous state on detection of an error condition. If multiple choices exist in network classifications, it detects the non-determinism and elicits a decision from the user to resolve it.

Ease of Management and Scalability

The design is scalable and allows easy and flexible management, with convenient searching and extensive transaction logs.

The new DNS software provides an effective and easy-to-use solution for DNS and bootp administration on a complex network like NYU-NET.

Modems continued from p. 24

local office.)

With these results in hand, ACF upgraded the entire set of DIAL and LawDIAL modems over the winter recess. Now, when you connect to the DIAL service, you are reaching a K56flex protocol 56K modem. If you have a 33.6 Kbps or lower speed modem, you won’t notice any difference in your service. With an x2 protocol modem, you’ll see a maximum connection rate of 33.6 for the present time. With a K56flex modem, you’ll get a much faster connection, but the exact speed will vary according to the phone lines between your computer and ours.

If you own a 56K modem, whether it is K56flex or x2, things will change slightly when the ITU standard is announced. With the new standard, new firmware will be written for 56K modems. Firmware is the programming within the modem which determines how it handles data. The DIAL and LawDIAL modems will incorporate the new standard as soon as the firmware upgrades are available. You will need to contact the manufacturer of your 56K modem to obtain the correct firmware upgrade for your modem.

If you are looking to purchase a 56K modem before the ITU standard is issued, choosing between the K56flex protocol and the x2 protocol is less important than choosing a modem manufacturer with a good reputation and a solid upgrade policy. ACF’s modems are running the K56flex protocol only for the present time; after the ITU decision all modems will share a common protocol.

When buying a 56K modem, you should pay careful attention to the manufacturer’s policy on upgrading to the ITU standard to avoid an additional charge.

Taub continued from p. 41

people who lack the skills to find gainful employment. Relying on the school system to solve these problems is not good enough – who can expect the city to maintain advanced computer labs when it can barely keep the school buildings in good condition? Furthermore, since schools are only open 180 days a year, for 8 hours at most, and only to children, this is not necessarily the best place to invest these resources.

Information is the raw material of the industries that will create ninety percent of the region’s jobs over the next fifteen years, and without the necessary tools to transform raw data into valuable knowledge, city residents, particularly the most disadvantaged, will find themselves locked out of more and more employment and career options. Community networks provide, at the least, the familiarity and confidence with computers that many of our city’s workers need.

For more information on community networking and how to get involved, follow these links:

Organization for Community Networks – www.ofcn.org/

University of Michigan Community Networking page – www.si.umich.edu/Community

Blacksburg Electronic Village – crusher.bev.net/

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