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 (second floor, Warren Weaver Hall), the ACF computer labs (listed inside the back cover), the NYU Information Center (50 West 4th Street), and most graduate-school offices. Copies are mailed to full-time university faculty, staff, and researchers. The mailing list is administered by Personnel from university records. If you are a full-time faculty member and you do not receive a copy, please notify your dean’s office; full-time staff should notify the personnel representative of their unit. If you are not among these groups but would like a free subscription, please send e-mail to acf.connect@nyu.edu.

You can also read Connect online, through NYU Web, at the URL http://www.nyu.edu/acf/pubs/connect/ For more information, see page 6. Since the summer 1995 issue, most of the material has been published in HTML, the native Web format; earlier issues (beginning with March 1993) are available in the text-only Gopher format.

We welcome your comments and suggestions about the articles in this issue, and about articles for future issues. Contributions are invited for consideration by the editor; for more information, please send e-mail to me at the address given here. Articles are written by members of the ACF staff, unless otherwise indicated.

Opinions expressed in the articles in this publication are those of the authors and not necessarily those of the Academic Computing Facility or of New York University.

Below many of the authors’ bylines are electronic mail (e-mail) addresses. If you do not use e-mail but would like to, call the ACF HelpLine at 998-3333 for information about opening an appropriate account.

This issue was prepared on Apple Macintosh Quadra and IIci computers, using QuarkXPress, Microsoft Word, Adobe Type Manager, Adobe Photoshop, and Aldus PageMaker, among other programs. Fonts used in this issue are Palatino for the text and Gill Sans bold for headlines, along with Zapf Dingbats for special effects; the cover design was done with Courier bold. Camera-ready copy of text and diagrams was produced using a 600-dpi Hewlett-Packard 4si printer at the ACF; Echo Graphics prepared the halftones from electronic files, and printed and bound the publication.

— David Frederickson
Tech Trek: The Designer in Cyberspace

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The Web frenzy is here, and our lives will never be the same.

We are wired, now, in our homes, schools, libraries, and offices; and we surf the Net from site to site around the world at the push of a button, from virtual museums to the likely virtual casinos, in search of information, communications, entertainment — or just for the ride (“See the USA in Your Chevrolet!”).

As more businesses and organizations charge forward in the rush to take advantage of the opportunity to distribute their messages free on the World-Wide Web, the information superhighway has become more like the streets of Pamplona.

The development of new technologies to bring graphics and audio to the information systems of the Internet has excited our imagination, and it has unleashed the bulls on Wall Street. Netscape, a company whose earning potential has yet to be proven, soared from its initial offering of $27 per share to over $150. Macromedia jumped $6 on the day it announced the development of a designer-friendly animated Web browser to rival the much-hyped Hot Java (which at this writing has yet to hit the highway). It’s all big roll of the dice as to who or what will dominate this new online culture. (Remember the Betamax.)

And the new technologies have unleashed the bulls of Madison Avenue, charging forward to sell everything from cars to bars, searching for new markets and trendy image (it’s oh-so-cool to be on the Web).

We now have new heroes: the pioneers Gates and Andreessen (so smart, so young, so rich!), the prophets Negroponte (Being Digital) and Stoll (Silicon Snake Oil — both reviewed by Tim O’Connor in the Fall 1995 issue of Connect), and the wizards of entertainment Lucas and Jobs (Toy Story).

The frenzy has produced countless books and magazines devoted to this new culture — how-to guides, Internet directories, studies on the changing shape of society — so much new paper for what is supposed to be a paperless world.

It has changed our language into an acronym-rich tongue (URL, FTP, HTML, HTTP, BPS) and it has reinvented new meanings to familiar words (hits, line, virtual).

And it has inspired new fashions — “Wired-Wear” and “Net-Gear: Never Surf Naked.”

The Dazzle of the Inexplicable

Much of this excitement of the Internet comes from our childlike joy of being dazzled by the new and inexplicable. The wheel must have been awesome when it arrived on the scene. And so were the inventions that changed the world of communications: the telegraph, the telephone, the moving picture, radio, television. We landed on the moon in the first animation of Georges Méliès’s Trip to the Moon, swooned as Betty Boop climbed out of Max Fleischer’s inkwell to dance across the silver screen; marveled at the surreal concept of Natalie Cole singing duets with her late father, and cringed as the computer-recreated dinosaurs stampeded...
The original NYU Web home page, whose URL is http://www.nyu.edu/. It provides links to other Web sites at NYU, of which there are now hundreds.

The Development of NYUWeb

At NYU, the ease of writing HTML led to the proliferation of random Web sites. They were like windows into the University that were appearing before an architectural framework had been constructed. The premise of NYU Web was to build a structure, where sites of information could be placed in a logical order. Eventually all the information on NYU CWIS would be translated into this new Web format, or visible through the NYU Web window.

Committees were formed to discuss this organization, and under the direction of David Finney, Vice-President for Enrollment Services and Planning, the physical task was handed over to the collaborative efforts of ACF and the Office of Advertising and Publications to develop a home-
page and format, and to provide an instructional and design guide for others at NYU creating their own sites.

As creative director in Advertising and Publications, I was given the assignment to produce these pages. I started with a list: learn HTML, review current university Web sites, devise a structural plan, create an NYU online visual style and identity, and build the NYU home page, the front door to the multiple sites within this online publication.

I raided the NYU Computer Store for guidebooks (Learn HTML in a Week), attended classes at the ACF, and took notes from instructional sites on the Web. I was in full-surf for a week, zooming around the world to see how others had done it.

Should the home page be a directory listing? A clickable map of the campus? An introduction of hyperlinked text? How will all the information be processed? How will it evolve?

It would take countless hours of information-processing to complete all the necessary elements of NYU Web, but at least an outlined structure would be in place. Unlike publications that cannot be reprinted without expense, Web pages can be revised and improved with ease, and it was important to get the pages online, link existing pages — and to learn, from viewer response, how to improve them.

Next came the style: type, graphics, color, page layout, and a theme that could unite the pages as a single online publication. The computer screen has always been like a window, a detail of a larger picture. And the theme of NYU Windows, while neither unique nor revolutionary, could provide this flexible theme to the NYU Web home pages. With the frames delineated in shades of gray, the windows that presented color photographs, logos, and graphics would appear to be chiseled out of the gray screen that Netscape, the most popular graphical browser, presents as its default. The NYU Web logo was created, along with a banner and header to unify succeeding pages. All of these graphics could be copied or adapted by other Web-page creators at NYU who wanted a tie-in with the visual identity of NYU Web.

The Highway Ahead

Today the task that lies ahead for NYU Web is formidable both in the amount of new information needed, and in tackling the issues facing all Internet information providers.

Viewer feedback is a significant factor in prioritizing the necessary information, and an NYU Web task force committee has been formed to address Internet and University issues. Topics such as copyright liability, security of personal data, “official” vs. “unofficial” pages, online applications forms, and online course syllabi are just a few of the many under discussion.

- Clearly, we need a search engine or index so that visitors can quickly find the information they seek—especially with the significant increase in the number of contributors to the Web.
- Links should be added to take full advantage

NYU Events is now published solely online, at http://www.nyu.edu/events/. This is the opening page of the Events Web site, designed by Luis E. Cerda; it offers a number of useful choices, including a calendar that’s updated daily.
of the cross-referencing of NYU information and to avoid any duplication.

- Information from publications such as bulletins, student guides, and research centers needs to be processed and linked.
- An interactive map of the campus should also be added, to aid both first-time visitors and long-term students and faculty; it should show admissions centers, schools, offices, book centers, facilities for research and student life, parking, and subway and bus stops.
- Web sites being developed around NYU include: Health Services, Personnel Services, The Office of the Registrar, Alumni Relations, Public Relations, NYU Summer, NYU Abroad as well as schools, colleges and departments.
- Current images are being scaled down and simplified through Debabelizer software as we strive to improve the transmission time of on-line graphics.

At the present time, there are several ways that viewers inquire for information: through the e-mail form to Webmaster at the bottom of each page, through site-specific requests for information, and through telephone inquiries at phone numbers published on the pages. In the first case, the queries to Webmaster are forwarded to various NYU offices to answer and process the requests. Michael Walker of the Information Center has developed detailed information-request forms for admissions publications, and Carllita Bell of the Office of Advertising and Publications has developed a server that can process requests for information and track the inquiries, while building a demographic profile of online inquiries for marketing analysis. Through the linking of software applications, inquiry information is completely paperless.

Many questions confront us as we continue to develop our Web site: Where are the visitors to NYU Web coming from? Are they responding to URLs printed in publications and advertising, or to Internet search engine directories such as Lycos or Yahoo? Is there a value in purchasing listings in commercial directories? What are the best ways to get NYU Web linked to other sites around the world? How can NYU Web stay up-to-date with the rapidly developing Internet technology?

The new online network transcends all geographical boundaries, and we are all running fast to embrace these new opportunities. The possibilities are limitless and the potential is awe-inspiring.

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**Next Issue: NYU's Grey Gallery Prepares to Debut on the World-Wide Web**

"As a result of renovations to NYU's Main Building, the Grey Art Gallery and Study Center suspended its normal gallery season, closing down its public space for the entire 1995–96 academic year," writes Frank Poueymirou, Associate Director of the gallery. "Given the renovation plans, the gallery faced the unsettling task of dismantling a schedule of exhibitions and publications that was already in place, and of rethinking the season. On the one hand, we had to take into account the burden of a darkened exhibition space; on the other hand, we now had time to undertake new initiatives. One such initiative was the design and production of a Grey Art Gallery Web Site."

See the full article in the next issue of *Connect*. And meanwhile, look for the gallery's debut on NYU Web.

**NYU Web and NYU CWIS: Which Is Which?**

NYU CWIS, the Gopher-based Campus-Wide Information System launched two years ago, is still alive and still dispensing volumes of information to NYU and the world. It can be accessed either through a Gopher browser (such as the one included in the IS menus of the NYU-Internet account) or seamlessly through NYU Web, which is a component of the World-Wide Web.

The programs that run the Web have certain advantages — particularly the ability to use older network tools such as Telnet and Gopher, as well as various "helper programs" for enhanced display of its information, and the ability to use *hyperlinks* to take the user from one data source to another. Furthermore, you can select the best browser for your computer and connections — anything from the simple character-based Lynx (part of the NYU-Internet account) to fancy graphical programs.

Thus at this point it seems sensible for NYU to move to on to the World-Wide Web protocols, which now offer the most flexible and attractive means of distributing and collecting information over NYU Net. How long will that remain true? In the evolving world of computers and networks, nothing is guaranteed except further change.

But NYU CWIS lives, and everything on it is visible through NYU Web. — DF
Paying the Piper on the Web: Is NetBill the Answer?

How will we pay for the many small items of proprietary data that someday we’ll be downloading from the Internet? In a December NYU colloquium, Professor Marvin Sirbu outlined a protocol that he and others at Carnegie Mellon University have been developing. Their NetBill protocol may be the way you’ll make your purchases. (For more about the ACF’s colloquia on computers and communications, see page 12.)

One of the grander promises of the Web is of the new dawn of online shopping. Though the prospect of an online mall may appall you, there are nonetheless likely to be times when you would like to make a financial transaction online — to buy a book, to pay for a subscription, to order a journal reprint, to download a copyright image. And even if you avoid the more commercial lanes of the information highway, the age of shrinking subsidies is going to mean that you’ll have to pay for more and more of what you need to get. As Professor Sirbu noted, the charges are likely to be numerous and tiny.

Obviously you could pay with a credit card; without a second thought, many of us order things over the phone and arrange for payment through a credit account. The system works; those who profit by it make sure it works well. There are abuses, but a fairly moderate level of consumer prudence seems to suffice.

(continued on page 30)

And the Latest Buzzword Is Java

Now that, like everyone else, you’re spending full time on the Internet (what? you’re not?), you hear everyone talking about the latest and greatest, so you know that the latest buzzword is Java. Java is new; Java is hot; Java is the next wave; Java is the killer app that will change the shape of computing. But is it?

Sort of; yes; maybe; and possibly.

What is Java?

Java is a programming language, which means that a program can be written in it to produce desired results. The result desired is usually to have two computers working together over the network, sharing the work in a way that minimizes the traffic on the network.

When a user clicks on a part of a Web page containing a Java link, a piece of computer code called an applet is downloaded to the user’s computer. The applet, originally written in the Java programming language, has been compiled (translated) into Java byte code, which, being machine-independent, will run on any computer that has the right interpreter. A Java-capable Web browser can then interpret the code, which could be, say, a multimedia application.

Since the applet is transmitted as a simple text message, it’s a much smaller file than the graphical files would be, and thus, it’s much faster to download. And if the results of the applet tend to be repetitive, sending the applet can be a more efficient use of the network than sending the results of the program’s actions.

Java’s chief architect is James Gosling, who began work on what was called Oak in 1991 as a language for the consumer-electronics industry, where it could be used to provide added services such as interactive TV. When it became clear in 1994 that the market for set-top boxes was not yet ready for prime time, the project was retooled for the World-Wide Web.

The Java code is based on C++, currently one of the dominant programming languages, with several elements subtracted and a few added. It was developed at Sun Microsystems — a major producer of Unix workstations — but is designed specifically to function on any computer platform. The Java interpreter can be incorporated into another program, and has been widely licensed; it is included in Netscape 2.0 and has been licensed by Microsoft for inclusion in its Web browser.

Some feel that Java holds the promise of radically changing the current computing environment; even normal desktop applications like word processors could be written in Java. If Java does catch on, the network itself will become the most important element (or as Sun says, “the network is the computer”).

— David Ackerman and David Frederickson
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The paperless office may not be any closer this year than last, but certainly more information is being made available online. Increasingly, the avenue for online dissemination is the World-Wide Web.

At many universities, people working with computer documentation have been seeking for years to get it all online. There are good reasons to do so: speed of publication, ease of updating, economy, conservation. There are disadvantages: you can't read online documentation if the computer isn't running, or if you're on the subway or at the beach.

Generally it's agreed that not all print versions of all computer documents will disappear, but probably most should be available online. Virtually all of it is written on computers, of course, and most is edited online; why, then, shouldn't it be published the same way? Online help is nothing new, but usually it's separate from the more discursive instructions that are printed. In the world of scientific computing, virtually all documentation is available online, and in many cases there is no formal print version. Much the same is true for major operating systems. But those audiences are relatively small; for material that has to reach a wider audience, print is often still the mode of choice.

**NYU and ACF Go Online**

Here at NYU, we've been publishing online versions of more and more of the materials we've been printing for years. The process has accelerated in the past year, and it will continue; at this point about twenty of the most popular ACF publications — including *Connect* and the full semester schedule of ACF classes and talks — are available through NYU Web. You can reach them from the main ACF Web page (http://www.nyu.edu/acf/), which can in turn be reached from the NYU Web main page through the menu items Facilities and Resources, then Computing Resources, or you can link directly to the publications list at http://www.nyu.edu/acf/pubs/ (for more complete instructions, see “Use Netscape or Lynx to View ACF Publications Online”). If you don't have a print version of a set of instructions you need, and don't have time to run one down, having a version online can be a timesaver, if not a lifesaver.

The ACF is not the only part of NYU to make material available online: the Registrar has made course descriptions available; GIGS makes grants a snap to find, if not to win; Admissions can get requests for information from interested Web surfers. Sandy Kaufman's article on page 1 tells of other things to come.

**And Connect?**

*Connect* will continue to be printed, and it will also be available online. We send the print version to fulltime members of the faculty and staff, and print extra copies for interested people to pick up in the labs and information centers. But as interest in networking grows, we won't be able to print (or afford) enough extra copies for the larger potential audience, so having it available online becomes more urgent.

And, after a couple of years of putting selections of *Connect* (and its former incarnation, *Academic Computing and Networking at NYU*) online through NYU CWIS, it is now being made available, almost in its entirety. In some cases, in fact, the online version is better: we can put most illustrations online in color, and we will soon be adding audio and video, where appropriate.

There are several questions that have to be answered as we pursue the goal of online publication.

First of all, there are the questions that have to do with making sure the people we want to serve are in fact served: Who makes up the *Connect* audience? What kind
of equipment do they have? What kind of connections?

There’s no one answer; since we try to address the computer-shy as well as the computer-literate, we have to assume that not everyone has powerful computers and high-speed connections. A good portion of our audience will be viewing Connect through a text-only browser such as Lynx (in the NYU Internet account), and another large segment will be using graphical browsers, but through connections or on computers that make large file transfers seem painfully slow. And then there are the avid users with fast connections and powerful computers, who want all the bells and whistles they can get. We can’t satisfy the third group if it means losing the other two.

Those using Lynx will see all the text, plus a few extras, such as the notation [image] where an image would show up in Netscape. Sometimes the Lynx user will want to know that an image is offered, but generally the information is useless, and often annoying. It’s possible to encode the Web document in a way that will either show nothing in Lynx or describe the image in some way that will help the user decide whether to go to the extra effort of downloading the image file. Sometimes, in our effort to use the graphical capabilities of the Web as much as possible, we will create a clickable button that is an image (I’ve used many); for the Lynx user, the link has to be provided another way. I’ve tried to provide the alternatives, but have undoubtedly failed in some cases; if you are looking at the pages and find such lapses, please let me know, at acf.connect@nyu.edu!

The size of the graphical files is an issue for the second group; the larger the file, the longer it takes to download it. But what’s a tolerable size? That depends on the user, and on how much traffic there is on the network. Again, feedback from users is the only thing that will tell us what we need to know.

— David Frederickson

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Use Netscape or Lynx to View ACF Publications Online

You can view ACF publications (as well as other Web pages) from your home computer or from on-campus computers connected to the Internet, using a WorldWide Web browser such as Lynx (a character-based browser included in the NYU-Internet account) or Netscape (a popular graphical browser included with the ACF DIAL accounts and with the suite of programs distributed for use on Ethernet-connected computers on campus). Here’s how.

**Using Lynx**

(NYU-Internet accounts on campus; conventional dial-in connections from home)

1. Select NYU Web from the NYU-Internet system’s main menu. This will launch Lynx and bring you to the NYU Web home page.
2. Type g (for “go”). The prompt URL to open: will appear near the bottom of the window.
3. At the prompt, type the address of the page you want, such as http://www.nyu.edu/acf/pubs/ and press the <Return> or <Enter> key.
4. Use the space bar and <hyphen> key to page forward and backward in the list of publications.
5. Titles and phrases in boldface are “links” to other documents. To select a particular publication, use the Up- and Down-arrow keys to highlight the title, and then press the Right-arrow key to access the document. Use the same keys to navigate the document and any links it has. Use the Left-arrow key to retrace your steps to previous documents or pages.
6. For more help within Lynx, watch the bottom of the screen for useful messages and hints. Type h for Lynx’s internal help. Type q (for “quit”) to exit Lynx and return to the NYU-Internet menu.

**Using Netscape**

(From labs, offices, and dorm rooms with direct NYU-NET connections, or from home with a DIAL account)

1. Double-click on the Netscape icon. This will launch Netscape.
2. Open Netscape’s File menu; select Open Location. Type http://www.nyu.edu/acf/pubs/ in the dialog box, and click Open.
3. Click on the scroll bar to page forward and backward in the publications list. Titles and phrases in color and underlined are “links” to other documents. To select a publication, click on its link. Use the same keys to navigate the document and any links it contains. To retrace your steps, click on the Back button at the top of the Netscape window.
4. For further help with Netscape, open the Netscape Help menu and select Handbook. To quit Netscape, open the File menu and select Exit or Quit.

**More about Lynx and Netscape**

Both Lynx and Netscape are available from the ACF. For further information on DIAL Accounts, please call the ACF HelpLine at 998-3333.

— Estelle Hochberg

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Can the Medium Help the Message? NYU Faculty Integrate Internet and Courses

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As more of the NYU community “gets wired,” increasing numbers of faculty have successfully integrated various Internet tools and resources into their courses. This integration seems most effective when the content of the class utilizes the advantages of Internet tools. The ACF Innovation Center has been an active partner to several faculty members this past semester who have been developing their use of this instructional technology.

Classes and the Internet

The recent explosion of the World-Wide Web should not overshadow other less sophisticated Internet resources that have been effective instructional tools for several years. Since 1988, Prof. Millard Clements (SEd, Teaching and Learning) has used the Internet’s communications resources in his courses in International Education and Environmental Conservation Education.

“I see the new WWW resources as both a curse and a blessing,” Prof. Clements wrote in a recent e-mail message. “Many of the new Web sites are powerful resources; the various AIDS sites are useful to the AIDS community; there are now Web sites devoted to a wide array of important social and academic concerns. To some extent, it provides access to information; it can provide connections among professionals, and it can sometimes nurture the development of new communities of the written word. But the Web has become commercial; it is closer to TV than it is to interactive communications. . . . There is too much emphasis on access to information. I think information plus communication plus community are what is important.” Profes-

Jeff Lane works at the ACF Innovation Center, focusing on technologies to aid instruction.
Professor Clements has required Internet accounts for all his students since 1990, having them participate in online communities through discussion groups, newsgroups, and e-mail communication.

**In Class on the Web**

A way to integrate the Web into teaching was presented to a standing-room-only audience last fall by Professor Barbara Kirshenblatt-Gimblett (TSOA, Performance Studies). She spoke to the NYU community at a colloquium cosponsored by the NYU EQUAL (Enhancing the Quality of Undergraduate Academic Life) Commission and the Academic Computing Facility on September 22, 1995. (For more about these colloquia, see pages 5 and 12.)

Professor Kirshenblatt-Gimblett has been using online discussion groups with her classes for several years, but this year decided to expand on the opportunities that the WWW offers for herself and her students. Enlisting the help of ACF’s Innovation Center, she acquired the skills and resources to develop the Web site for her class “Tourist Productions” (at http://www.nyu.edu/classes/tourist/). The class site contains an enriched syllabus including full text of some required readings, bibliographies of recommended readings, and links to other Internet sites relating to each class unit. It also has a link to the class newsgroup (nyu.tsoa.ps.tourist) and a form for sending e-mail to the professor.

**Teaching with the Internet: Lessons Taught, Lessons Learned**

*When asked for reactions to teaching with the Web, Dean Nagle made the following observations. —Ed.*

Interactive computer technologies were fundamental to a course I taught with a colleague this fall through the GSAS Draper Master’s Program in Liberal Studies — discussed in Jeffrey Lane’s article.

The students had a wide range of knowledge and affinities for the computer, and we spent too much time teaching basics. But once computers were integrated into the class dynamic, the technology quickly transformed from an obstacle to a helpful and even friendly tool. The newsgroup in particular was a vital way to continue discussions outside the once-a-week class meeting. Students especially appreciated and commented on our accessibility; through e-mail, my co-teacher and I were always around.

Four students (out of twenty-three) composed Web pages as their final projects. This could have been more successful if I had worked with more students sooner on the mechanics of HTML and other Web-specific skills.

One of the real pleasures of the course was the malleability of the syllabus; this would not have been possible without the electronic component. Some students liked that, but others felt that the class wasn’t structured enough. This taught me the importance of the balance between allowing the class to take a shape of its own, and guiding the shape (and tone) it takes.

Next time I use computer technologies in the classroom, I’ll streamline the logistical information so that it only takes one class session; and early in the semester will schedule a day-long workshop with the Innovation Center to make HTML sensible for students wishing to create Web pages.

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Robin Nagle is Assistant Dean of GSAS.

For her writing workshop, Professor Anne B. Keating wanted to hark back to the basics of the craft, while employing the newest technologies.
In her demonstration, Professor Kirshenblatt-Gimblett used Netscape Navigator to give those attending a quick tour of some notable online sites, and to show how this medium is relevant to course content. "I have always believed in a 'resource-rich' approach to teaching and want my students to have their own first-hand experiences with varied materials and to interact with each other," she explained. "Discussion, collaborative projects, and peer learning are important to me. Using the Internet was a perfect match for my teaching style and my course material." Her course explores how we understand the world outside our own experience, as tourists, and how museum and tourist attractions present the world. "The growth of the World-Wide Web has created another kind of tourist and another kind of museum . . . and students have access twenty-four hours a day to these resources and to each other."

For Assistant Dean Robin Nagle (GSAS), part of the reason for going online with her course "Garbage in Gotham: The Anthropology of Trash" was to avoid creating more trash, in the form of printed syllabi and typed papers. She required students to browse the Web, submit their papers via e-mail, and participate in an online class newsgroup. They also had the option of creating a Web page as the medium for their final research project. (For more about the Trashless Classroom, see the fall 1995 issue of Connect.) Dean Nagle writes, "In a university, the Web allows teachers and students to dissolve classroom walls, continue conversations outside the boundaries of time, invite outsiders inside the discussion, and glean knowledge from people with similar expertise or curiosity from anywhere that the world is interconnected."

**Online Communications: Which Will Work Best for Your Class?**

E-mail communications between faculty and students can be an effective means to facilitate discussion, to handle course administrative issues, or to share other "outside" electronic communications. One may directly send e-mail to many people at once by placing a list of recipient addresses in the "To:" field of an e-mail message. But there are easier ways to store larger lists of e-mail addresses, such as those for a class or a group of colleagues, using the "addressbook" feature of Pine (the mail system used on the NYU-Internet accounts), or by using the "Nicknames" feature of Eudora (the mail client software that accompanies NYU-Net and DIAL/PPP software installation). A "listserv" (e-mail discussion list) one of the older Internet communications technologies, uses e-mail to distribute messages to a list of "subscribers" stored on a central computer system.

In a newsgroup, all communications are posted in a central location and can be viewed by anyone, either in the local community or on the Internet at large. (Newsgroups created here at NYU may be limited to the NYU community.)

There are several considerations for faculty members who may be interested in using e-mail or newsgroups as part of their course assignments: Is the instructor experienced enough with these communications tools to seamlessly integrate them into the syllabus? Will online communications be facilitated if the members of the class know that their messages will only be received as e-mail and by a set number of participants? Will the purposes of class discussion be better served by the bulletin-board atmosphere of a newsgroup, where items with the same subject can be grouped or "threaded"?

**Integrating Online Technologies**

So far, the Web is still a new teaching tool. But for the adventurous, it seems promising. For faculty, there seem to be several advantages of integrating online technologies into the curriculum:

- **Opportunities for communication with students are enhanced.**
- **The syllabus can easily be distributed and revised.**
- **Class discussions can continue outside of the classroom.**
- **The world's Internet resources and information can be seamlessly integrated with your own resources.**

For courses in some areas, teachers may be able to take advantage of some unique properties of the Internet:

- **Direct news sources and archives (text, visual and aural).**
- **Access to governmental information or data.**
- **"Real-time" audio and video conferencing (CUSeeMe, PowWow, Talk).**
- **Collaborative projects on an international scale.**

For help in evaluating these and other resources, please come to the ACF Innovation Center.
ACF Innovation Center Offers Faculty a Chance to Explore and Use Instructional Technologies

The ACF Innovation Center houses many specialized resources for faculty who wish to explore Internet tools or other instructional technologies for use in their teaching and research. It will be holding open house on Thursday, February 29, for faculty members who are interested in finding out about these technologies. The members of the center’s staff — Joseph Hargitai, Jeffrey Lane, Johannes Lang, and I — try to stay current with the latest developments in Internet and multimedia applications, so that we can help you evaluate your options and plan your project.

We also try to have the latest equipment. To our complement of Power Macintosh AV machines, we have just added a Gateway P5-120, a Pentium-based 120-Mhz multimedia machine running Windows 95. The Macintosh systems’ peripherals include HP 1200-dpi color flatbed scanners, Nikon Coolscan 35mm film scanners, and a variety of storage devices, such as Syquest 270-megabyte drives and Iomega Zip drives.

A modest but growing collection of instructional CD titles is housed in the Innovation Center for evaluation by faculty. The staff keeps up to date on various freeware and shareware applications available on the Internet and makes them available to faculty as needed. See our Web page at

http://www.nyu.edu/acf/ic/whatsnew.html

to learn about the latest offerings.

Faculty members are invited to come to the Innovation Center’s open house on February 29 (see box below) or to Open House at the ACF Innovation Center

Please join us at our Second Annual Spring Open House for NYU Faculty at the ACF Innovation Center second floor of Warren Weaver Hall (251 Mercer Street, at West Fourth Street) Thursday, February 29, 1996, 2 – 5 pm

Come meet the ACF staff, chat with other guests, and share in our refreshments.

Welcome to the INNOVATION CENTER

Instructional Technology Perspective: The adoption and use of instructional technology has extended the boundaries of academic scholarship and classroom instruction. As a discipline center, this area champions the integration of technology to accomplish pedagogical goals, and to foster faculty development. The emergence of network-based interactive technologies for instruction and communication are bringing dynamic and more accessible tools to the classroom. The executive shaft of content to the World Wide Web that is currently taking place provides significant opportunities to weave this content creatively into course instruction.

Academic Computing Facility will hold its Second Annual Spring OPEN HOUSE FOR FACULTY at the INNOVATION CENTER on Thursday, February 29, 1996, from 2 to 5 pm. All NYU faculty and their guests are invited. Refreshments will be served.

More text regarding ACF Instructional Technology Services

Several course-related Web pages have been produced by faculty members with the resources of ACF.

New Acquisitions:

A new Gateway Pentium 120 has arrived and is being configured as a multimedia system.

Virtual Reality (virtual reality) software has arrived! We look forward to creating navigable environments, and courses which manipulate objects.

General Information

What’s New

drop in during regular hours (Monday through Friday, 9am to 10 pm). If you prefer to make an appointment for a longer consultation, please call us at 998-3044 or send e-mail to ic@nyu.edu.

— Vincent Doogan
vincent.doogan@nyu.edu

As ACF Associate Director for User Services, Vincent Doogan supervises the Innovation Center and coordinates various ACF initiatives in instructional technology.
Diverse Languages on the Web — Feb. 9 Colloquium
Finding a standard means of representing diverse languages and characters is fast becoming a critical issue for World-Wide Web development. This will be the featured topic on Friday, February 9, in the first of the spring 1996 NYU colloquia on computers and communications, when François Yergeau will speak on Characters, Unicode, and the World-Wide Web.

"As the World-Wide Web grows by leaps and bounds," our speaker notes, "it expands far beyond its origins in the West and the limited set of Latin-based languages and scripts. A need for portable representation of a large number of characters has brought Unicode, the universal character set, to the forefront of the move to standardize Web technology."

An expert on Unicode and the internationalization of HTML, Dr. Yergeau has also been instrumental in developing a multilingual World-Wide Web browser distributed by Alis Technologies. Look for a report on Dr. Yergeau's talk in a future issue of Connect.

The NYU Colloquia

The NYU Colloquia on Computers and Communications are a continuing series of presentations occurring each fall and spring semester and co-sponsored by NYU's Academic Computing Facility and the Faculty of Arts and Science, with support from Apple Computer, Inc. Additional departments and schools join in co-sponsorship of the individual colloquia.

All NYU faculty, staff, and students are welcome to attend. As we go to press, several other new presentations are being planned for the spring semester. Details will be posted on the NYU Web at http://www.nyu.edu/acf/nyu-events/ and flyers are mailed to all NYU faculty. To receive an e-mail flyer, or to be added to the ACF's mailing list, please send e-mail to document@nyu.edu or call the ACF HelpLine at 998-3333.

Videotapes of Past Colloquia
Since 1993, all colloquia have been videotaped, and the tapes have been available on loan directly from the ACF. This past semester, to make them more widely available for instructional use, tapes of all colloquia have been placed on reserve at the Avery Fisher Media Center in Bobst Library, where they can be viewed onsite or borrowed (by faculty) overnight for incorporation in a class session. A substantial number of the colloquium tapes have been entered in BobCat, Bobst Library's online catalog system; all are included in the Avery Fisher Center's reserve list.

— Estelle Hochberg
hochberg@nyu.edu

ACF HelpLine Q&A

Q: I often get busy signals when I try to connect to NYU-Net from home via modem. Is something wrong?

A: No; when your computer dialed, all the NYU modems were busy. You might try connecting at a less busy time.

By now, the ACF has close to 500 modems that link to NYU-Net. If you get a busy signal, it means there are no more modems available to take your computer's call.

Late evenings are the busiest times for the NYU modem pool; it's often full between 9 pm and 2 am. If you are able, try to connect at other hours. Otherwise, you may want to keep trying until you find a free modem.

— L. Barnett

Call the ACF HelpLine at 998-3333

Arts Grants Info Online: TSOA Joins GIGS
The Tisch School of the Arts has joined GSAS and the School of Education in making grant information available to graduate students online through NYU CWIS. Tisch students can find grants categorized by field such as acting or film production as well as by general interest. Soon after the Tisch GIGS page was posted in September 1995, it was being accessed some 500 times a week.

NYU's GIGS (Grants in Graduate Studies) is an online information source designed to help graduate students locate grant money for tuition and dissertation research. GIGS was established in the summer of 1994 by the Graduate School of Arts and Science and joined shortly thereafter in the fall by the School of Education. This resource includes U.S. government, international, corporate and private funding agencies that support graduate study and research as well as departmental grants internal to New York University. (For more on GIGS, see the September 1994 issue of this publication.)
In matters of electronic privacy and online communication, 1994 and 1995 were discouraging years in the United States. Newly popular forms of communication — electronic mail, network news, and Web publishing — were embraced by private citizens. However, it has become clear that the U.S. legal system offers few explicit indications of how cherished American ideals (such as freedom of speech, freedom from unreasonable search and seizure, and the right to privacy) can be protected in the new medium we now call cyberspace.

Freedom of expression is protected when it takes the form of printed material or public speech; it is more frequently restrained in broadcast media such as television and radio. At present, it is not clear that U.S. lawmakers or courts know how to categorize cyberspace communications. Cyberspace proponents and privacy advocates assert that online expression should be protected as much as printed information is protected; some politicians and interest groups, on the other hand, argue that cyberspace is a broadcast medium that most resembles television, and that it must be regulated accordingly.

At the center of these discussions is a movement to keep cyberspace “clean,” which is generally interpreted to mean that obscene or offensive material should be suppressed or regulated.

Both sides tend to phrase their arguments in apocalyptic terms. Cyberspace advocates view the current debate in terms of the individual battling for liberty against a tyrannical state that would feel free to review even private e-mail for offensive content. Moralists frame the debate as a fight to defend children from harmful or offensive material and to prevent criminals and terrorists from operating in complete secrecy. Neither side seems able to accept that nearly every element of the dispute over freedom in cyberspace resides in a shapeless area to which no group can lay claim.

As with other reforms, current U.S. proposals tend to use children, drugs, and terrorist bombs as excuses to trim civil liberties and impose restrictions that would be unconstitutional if they were applied to traditional media. Lawmakers, courts, and law-enforcement authorities make distinctions between information in electronic form and the same information when it appears in printed form (which has historically been protected by the U.S. Constitution).

In this topsy-turvy world, for instance, information that is completely legal when printed on paper is illegal when it exists in electronic form. In one case, the book Applied Cryptography, by Bruce Schneier, contains an appendix that lists the source code for many computer programs that can be used to encrypt information. One could type or scan the material into a computer and compile it into working programs. The book may be legally exported from the U.S. The electronic version of the appendix, however, may not be exported from the U.S., because it is classified as a munition — exactly as if it were a missile, a tank, or a rocket launcher. (See
Ensuring Privacy

In the open range between the extremes of utopia and paranoia, there are modest steps that private citizens can take immediately to familiarize themselves with the tools of the privacy trade.

One encryption tool, PGP (Pretty Good Privacy), is available over the Internet at no cost, to operate on most major computer systems. (See http://web.mit.edu/network/pgp.html for information on PGP.) PGP allows you to securely encrypt mail messages and computer files, and to create digital signatures for mail and files. (For more about PGP, see “When ‘Pretty Good’ Encryption Is Good Enough” on page 18.)

PGP is moderately difficult to operate, and its concepts can at first be complex to grasp, but it can be a useful tool that allows close-knit groups to exchange secure mail messages.

A person interested in exploring the world of encryption can get a personal copy of PGP and learn how to use it properly. One approach is to experiment with friends, try to exchange encrypted messages, and get a feel for how it works. PGP performs three essential functions for anyone concerned about privacy of electronic information.

• It can be used to encrypt — that is, to scramble — files and mail messages so that only you or the message’s recipient (or both of you, if you choose) can unscramble them.

• It can be used to create a “digital signature,” which is attached to a file or a message. If any part of the message is modified in the slightest way, the signature will fail to pass authentication when the recipient checks it.

• It can be used to authenticate people and messages. The idea is that if you add my PGP “key” to your keyring, then you can compare all later messages and files from me against my known, good key in your possession. If the information passes PGP’s authentication check, you can be assured that I am the author of the message, and that the message was created on the date and at the time noted in the timestamp that is attached to the message.

At its heart, PGP relies on what is called a “web of trust,” meaning that its users must exchange keys, which are tiny pieces of computer code that are the electronic equivalent of a passport. People vouch for each other, and at any time you can check your copy of a person’s key to determine whether the individual has been vouched for by someone you trust. In this way, PGP follows one model of human social interaction, in which we exchange common bonds upon meeting a stranger. (“Hi,” you might say at a wedding, “I’m Bob, and I’m married

http://www.qualcomm.com/people/pkarn/export for information about a current lawsuit against the State Department regarding the export of this computer code.)

To date, courts have generally been unwilling to extend traditional protection to newer forms of expression, even when equivalent written and spoken expressions are recognized as protected forms of speech. As a result, the world of cyberspace enjoys significantly less protection from seizure and scrutiny than the world of paper, ink, and voice.

At present, early in 1996, it is not yet clear how various legal issues will be settled, though in the eyes of many activists, today’s uncertain period may yet provide the best possible opportunity for private citizens to seize control of the issue in favor of greater individual privacy and freedom.

It is still legal for U.S. computer users to acquire and use tools that can provide reasonable privacy for computer files and online communication. And as long as legislation aimed at reforming communications law remains stalled in Washington, there is still a chance for citizens to contact lawmakers who might vote to impose broad new restrictions on computer and Internet use.

Popular interest in the Internet skyrocketed in the last year, and such services as e-mail and Web publishing have become less exotic and more accessible to private citizens. In the process, computer users have become aware of software privacy tools. These are programs that make it possible to securely scramble personal information, and to enjoy private, tamperproof transmission of data. If people begin to widely use such software, say privacy advocates, then the government may find it impossible to enforce a broad ban on privacy programs.

Techno-optimists have declared that we are entering a new era of personal liberty, in which widespread adoption of digital technology will provide greater personal freedom and privacy for all those who have online access, whether in democratic countries or under oppressive regimes. Techno-pessimists argue that eventually this medium will be reined in and tightly controlled by authoritarian governments.

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Is It Legal to Use PGP?

Possession and use of PGP versions 2.6 and higher, as distributed by the Massachusetts Institute of Technology, are now legal in the U.S.

Early PGP versions included the RSA encryption algorithm, which is a product patented by MIT and licensed to a private company, RSA Data Security, Inc. (RSADSI). Because PGP’s author, Phil Zimmermann, included RSA encryption in PGP without RSADSI’s permission, the software was technically illegal to use in the U.S., because it infringed on the RSA patent.

In 1994, MIT arranged for free use of the RSA module in PGP for non-commercial purposes in the U.S. The result is that PGP versions 2.6 and later may be freely used for noncommercial purposes. (The current PGP release is version 2.6.2.) For profit-making organizations, Viacrypt sells a commercial version of PGP. (Viacrypt can be reached by e-mail at viacrypt@acm.org.) However, there is another hurdle to using PGP.

Due to strict U.S. export laws, none of these products may be exported from the U.S., because they are legally classified as munitions. Zimmermann himself lived for several years under threat of indictment for having exported PGP from the United States via the Internet. He takes full credit for writing the software, but denies ever having exported it. Indeed, even the official MIT versions typically appear on overseas host computers within hours of their release from the MIT site. The case against Zimmermann was finally dismissed in January 1996, when the Justice Department chose not to indict the programmer.

In addition to the U.S. export ban, some countries have made it illegal to use or possess encryption software — including PGP — unless the user first surrenders a copy of the secret key to the government. At the beginning of 1996, this was the situation in France, Russia, and Belgium.

As of early 1996, PGP ownership and use is still legal in the U.S. However, federal officials have suggested that they may consider pushing for a law that would require users of encryption products like PGP to register their secret keys with a federal agency, so that law-enforcement authorities can gain access to encrypted information in the course of a criminal investigation. Privacy advocates vow to fight any such legislation.

to the bride’s cousin Sue,” and your interlocutor responds, “The groom’s my cousin; my name is Alice.” Web of trust established.)

If all this sounds like cloak-and-dagger spy business, or like the kind of ranting associated with exceptionally paranoid people, consider what reliable electronic privacy could mean in your personal and professional life.

- If you use e-mail for routine business, how much trust would you place in a sensitive message you receive? For instance, if you are a university administrator who is handling a student disciplinary matter, and you receive a mail message about the incident from a colleague who is involved in the event, can you be sure that the message is truly from the person it claims to be from? An authenticated digital signature on the mail would allow you to proceed with reasonable confidence that the message was valid.

- If you are a student whose classwork is supplemented by electronic communication with your professor, and you receive a crucial message about a presentation you are scheduled to make, can you be certain that the message is genuine and not a forgery created by an ultracompetitive fellow student? A digital signature, along with the date stamp (which serves as a kind of electronic postmark) could assure you that the message is genuine.

- If you are a professor who prepares final exams on your home computer, and you need to submit them to the department’s administrative assistant, can you be sure the message will not be intercepted between your computer and the assistant’s? PGP’s encryption feature would let you scramble the message so that only the assistant can unscramble it.

Paranoia or Preparedness?

For those who might dismiss privacy concerns as outbreaks of paranoia, there were a number of chilling incidents in the news during the last two years. Some of these could be addressed by the widespread use of strong encryption; many are the result of greater official intrusion in the world of cyberspace. More boldly than ever, governments and corporations seem to have begun intruding into what any reasonable person would consider private business.

Consider some events of 1994 and 1995:
The move came in response to the staggering growth in digital communication, which is more resistant to eavesdropping than conventional analog communication. If the effort succeeds, the bureau would have the ability to tap many more domestic telephone calls than is now possible. FBI spokesmen assure the public that law-enforcement agencies perform less than 1,200 wiretaps annually and that the bureau does not expect that number to increase significantly. The New York Times reported (on November 2, 1995) that the FBI has proposed new plans to dramatically extend wiretap capabilities. Louis Freeh, director of the FBI, contested this in a letter to the chairman of the House Judiciary Committee (http://www.fbi.gov/wiretap.htm). But the director acknowledged that the bureau considers having extensive access to state-of-the-art wiretapping an essential part of its mission (as stated in http://www.fbi.gov/crypto.htm). Meanwhile, privacy activists gently remind us of the need for constant vigilance against U.S. government abuses (http://www.cpsr.org/cpsr/privacy/epic/epic.html; http://vip.hotwired.com/Lib/Privacy/index.html).

CompuServe restricted its network news service, based on the content of certain news groups.

CompuServe, a U.S. company that is seeking to become a major worldwide Internet service provider, took unprecedented action just before the end of 1995. The company announced that at the demand of prosecutors in Munich, who objected to the content of certain news groups, the online service would ban more than two hundred sexually oriented network news groups from access through any CompuServe account around the world. As the year ended, CompuServe was at the center of a firestorm of controversy. The German government denied having made any such demands, and CompuServe publicly promised to engineer its service so that it could selectively control news access solely for customers in Germany. U.S. activists who oppose attempts by Congress to regulate Internet traffic noted the irony of the situation, in which a European power imposed — even if only temporarily — broad restrictions on a U.S.-based information provider, precisely in subject areas U.S. reformers have tried to restrict. As this article was written, CompuServe and the German government were pointing fingers of blame at each other, but the news groups in question were still unavailable to CompuServe subscribers. Two popular slogans among Internet enthusiasts are that the Internet “recognizes no geographical borders” and that it has the ability to “interpret censorship as damage, and route [traffic] around it.” The CompuServe case is a chilling reminder that on the Internet, repression and restriction also respect no traditional borders of culture or geography, and that technological solutions are not always impervious to political manipulation.

The U.S. government still maintains tight control over secure computer hardware and software.

All strong tools that can be used to encrypt information are officially classified as “munitions,” along with the usual military hardware, and are subject to strict U.S. export controls. (Some encryption tools are considered so effective that even U.S. intelligence agencies are unable to break the codes.) People convicted of violating the export regulations are subject to heavy fines and jail sentences. One result of this situation is that U.S. companies are unable to produce competitive products for world markets when those products contain cryptographic features. The only security tools approved for export from the U.S. are tools that are cryptographically weak, and nobody involved in computer security — whether buying it or selling it — has a vested interest in relying on suspect security products when the goal is to protect sensitive information.

Netscape crippled its own server software to comply with U.S. export laws.

Netscape Communications, which produces the most popular browsing software used to read Web pages, released its secure Web server in 1995. (A Web server is the software that makes Web pages available on the Internet.) Netscape’s target audience for that product is primarily the business market. The software incorporates a cryptographic feature that scrambles information as it passes over the Internet, in order to allow credit-card and other sensitive transactions to be transmitted securely. However, because of U.S. export restriction, Netscape was forced to offer weakened cryptographic features in order to get approval to sell its product overseas. Netscape developers watched helplessly as resourceful computer researchers in Europe quickly and gleefully cracked the server’s security with surprisingly slight effort. The Europeans had made their point: By forcing companies...
to weaken security features, the U.S. government undermines its own software industry.

• The Clipper Chip may rise again.

In 1994, the Clinton administration abandoned its efforts to introduce the “Clipper Chip” in telephone products. The Clipper initiative would have allowed manufacturers of communications equipment to legally install strong cryptographic features into devices and to sell them domestically and overseas. These devices would transmit encrypted information, so that anyone who managed to tap the telephone line would hear only unintelligible noise. The government, however, would retain “master keys” for each encryption device, to be held in escrow by two government departments. On paper, the plan called for the Justice Department to be granted access to those master keys only after receiving legal authorization in the form of a court order. It appears, though, that a broad majority of the American public remembers past abuses sufficiently to deeply mistrust the Justice Department; public opposition eventually doomed the Clipper Chip. However, it is widely rumored that a revised version of the scheme will emerge sometime before the end of the century. Observers expect that there will be no great demand for such products outside the U.S. Why, ask critics of Clipper, would any foreign government or corporation want to use an encryption device to which the U.S. government holds the master key? It seems the U.S. government favors strong encryption tools — but only as long as it can override encryption at its discretion.

• The FBI may want a copy of your private keys.

The director of the FBI, Louis Freeh, has hinted that his department might at some point seek to entirely outlaw private encryption schemes in which federal authorities do not have access to the keys. Freeh entered uncharted territory when he hinted that use of private encryption software might eventually be made strictly illegal in the U.S. (Possession and use of such software is already prohibited in France, Russia, and Belgium.) Freeh explains that strong encryption is too dangerous in private hands, because it can be used by drug traffickers, terrorists, and producers of child pornography.

Staking Claims before the Fences Get Built

Many of these events received considerable attention in the news. They caused a number of people — not all of them computer experts — to reconsider certain realities of the online world, and to evaluate all the available options that might provide for better integrity and security of electronic communications, including, of course, private electronic mail.

Politically speaking, these are all emotionally charged issues that cannot be reduced to simplistic terms. But concerned citizens have the option of acquainting themselves with software privacy tools now. And there may still be time for people to educate elected representatives about issues like privacy in cyberspace.

The Internet finally reached critical mass in the United States during 1995. Sophisticated online services and communications went mainstream with astonishing vigor. E-mail addresses now routinely appear in traditional publications and in advertisements. Web addresses are plastered on billboards and buses. A significant number of households across the U.S. have started to add additional telephone lines to allow uninterrupted modem access to online services without interfering with regular voice service.

Many people in the Internet community, and also in the printed media that target the online community, cheer these developments. Electronic communication is viewed in many circles as a liberating force that provides unprecedented powers to ordinary citizens.

Given the right tools, say enthusiasts, any private individual can now communicate with a mass audience (by way of topical mailing lists or network news groups), publish material free from censorship at little or no financial cost (by creating a World-Wide Web site through an independent network-service provider), slice through layers of bureaucracy (by sending e-mail directly to an individual at any level in an organization), take advantage of online information as effectively as any big business (by accessing public and private databases), and conduct business without the constraints associated with paper mail and telephone calls (by using private e-mail and other one-to-one forms of communication).

But for each step forward, cyberspace enthusiasts have come to realize that they must remain perpetually vigilant against the intrusions of governments and other authorities, and that the dizzying freedom associated with the early days of the Internet may not always be taken for granted.
When “Pretty Good” Encryption Is Good Enough: 
Cryptography for the Masses

At its heart, cryptography is the science of scrambling information so that it is meaningless to a random observer but useful to the legitimate recipient, who must possess a secret key that allows the information to be unscrambled.

Once the specialty of spymasters, strong cryptographic tools are now available for personal use, so even modest desktop computers can be used to protect information from snoopers. Perhaps the most prominent encryption software today is PGP (Pretty Good Privacy), which is available for DOS, Mac, OS/2, Amiga, VMS, and Unix platforms. PGP was written by Phil Zimmermann, a programmer who has always been fascinated by cryptography and its practical applications, and who has a keen interest maintaining personal privacy.

The Key to Cryptography

A traditional weak point of cryptography has been in getting the secret key that unlocks an encoded message into the hands of the intended recipient. For example, if your communications were monitored by an enemy, and you transmitted the secret key that could unlock your documents, the key itself might be intercepted. This would allow the enemy to decode your later messages, or in some cases to impersonate you by encoding messages with the key.

In 1976, Whitfield Diffie and Martin Hellman invented a new technique known as public-key encryption (reported in IEEE Transactions on Information Theory, Nov. 1976). The Diffie-Hellman algorithm involves the concept of a pair of secret keys. Information generated by the secret keys can be exchanged between two parties to create a “session key,” which is then used to encrypt subsequent messages.

In 1978, mathematicians Ron Rivest, Adi Shamir, and Leonard Adleman invented a public-key algorithm known as RSA, which can be used to encrypt a message and to create a digital signature of it. So, a message can be scrambled, requiring the private key to unlock it. In addition, the message might be transmitted without scrambling, but with a digital signature (a kind of electronic certificate) attached, or it can be both encrypted and signed. The signature allows the recipient to verify that the message has not been changed in any way in transit, and that it was truly created by the person who signed it, thereby preventing the distribution of forged messages.

PGP is built around several algorithms, including RSA.

For most people, it is not necessary to contend with the mathematical principles behind PGP. However, having a basic knowledge of how the software works will help you make the most efficient use of encryption and digital signatures. Consider investing in one of the standard PGP books, Protect Your Privacy: A Guide for PGP Users, by William Stallings (Prentice-Hall, 1995) or PGP: Pretty Good Privacy, by Simson Garfinkel (O’Reilly & Associates, 1995). Each provides background details and plenty of helpful hints.

The Key to PGP

At the most basic level, you will need to perform the following steps after you install PGP on your system:

• Generate your own pair of private and public keys. You will keep the private key for your own use only, protected by a secret passphrase you select. You will eventually release the public key to the world. You will need to supply the secret passphrase to your computer each time you use one of your keys to encrypt, decrypt, or create a signature for mail or files.

• Sign your own public key, certifying to the world that you yourself are the owner of the key. (Think of what you do when you get a new credit card in the mail: the first step is to call the credit card company to identify yourself and activate the card.)

• Get a handful of friends who use PGP, and have them sign your public key, which indicates that each of them certifies that you are who you claim to be. Each of you should sign each other’s public keys.

• If you can get several widely known PGP users to vouch for your identity, add their signatures to your key as well. This activity is known in the PGP world as establishing a “web of trust.” For example, you may receive my key and may not know who I am, but if my key has been signed by several people you know and trust, you may be willing to add me to your keyring with reasonable confidence that I am who I say I am.

• After you have accumulated several signatures on your public key, extract the key to a text file. You can then make the key available, as a block of text, for anyone in the world to take. Some people distribute their keys through the World-Wide Web. (For a copy of my public key, see the URL http://www.nyu.edu/acf/staff/oconnort/oconnort.pgp.html) Others put them in their accounts, so that when the account is fingered (e.g.,
“finger oconnort@acf2.nyu.edu”), the key will be displayed. There are also “key servers” on which you can post your key.

You will also want to extract your key’s “fingerprint,” so that people who retrieve your key from somewhere on the Internet can verify that the key’s fingerprint matches the fingerprint you have made separately available. (Again, as an example, my PGP fingerprint appears at the beginning of this article, in the small biographical paragraph; it is also in the PGP section of my home page and on my printed stationery.)

Other individuals can add your key to their keyrings. You can add their keys to your ring. Once you have a key on your public ring, you can send encrypted messages to the owner of the key. Only the recipient’s secret key will be able to unscramble the message. You can also verify that a digital signature attached to a file or a message matches the key on your public ring. If not, there is the chance that the message in question is a forgery, or has been altered in transmission.

It is considered good practice to create what is known as a key revocation certificate immediately, so that if your secret key is compromised, or you forget your secret passphrase, you can send out a PCP-authenticated message telling the world to invalidate the old key. These techniques, and many others, are detailed in the standard PGP literature.

The most secure use of PGP is considered to be on one’s own desktop computer, even though PGP is available for multi-user systems. In theory, if either the multi-user system or the network it is connected to is compromised, or if the system is operated by untrustworthy personnel, your secret key might be captured.

**PGP in Action**

These are the steps involved in encrypting a message using PGP. Tim O’Connor writes a message to be sent to the writer L. Manning Vines. He sends it to Vines, encrypting it with the Vines public key and signing it with the O’Connor secret key, producing a message that has the normal lines for address and subject, a pair of lines indicating the beginning and end of a PGP message, and several lines of gibberish in between. Vines unscrambles the message using his private key and secret passphrase, revealing that the information between the “BEGIN” and “END” lines really says: “Hello, world!”

In decrypting the message, PGP will also attempt to check the O’Connor signature against the public O’Connor key stored on the Vines ring. If the signature is present on the ring and it matches the signature embedded in the message, Vines knows that O’Connor must be the author of the message. (If Vines does not have a copy of the O’Connor public key, PGP will still be able to unscramble the message, but will be unable to validate the O’Connor signature. So, Vines would be able to read the message, but he could not be certain that O’Connor is genuinely its author.)

O’Connor, meanwhile, knows that only Vines, using his secret “L. Manning Vines” key, can decode the message.

PGP is considered to be a very secure means of scrambling a file. Experts in the field, however, admit that they can never predict what new technique may be developed to break an encryption scheme, or what loopholes may eventually be discovered in cryptographic software. This is why Phil Zimmermann modestly christened his creation “Pretty Good,” acknowledging that only a fool would contend that a public-key technique is completely bulletproof. For the majority of PGP users today, “pretty good” is considered strong enough to provide a healthy level of security for sensitive mail and files.

Meanwhile, privacy activists eagerly await future PGP releases that may make the notoriously complicated program easier to operate. They also hope that developers of electronic mail programs will build in some ability to encrypt and digitally sign mail simply and transparently, so that computer users can focus on getting their messages out, rather than on the mechanics of running PGP.

— Tim O’Connor

### New Internet Access Stations Online at Bobst, Loeb, and 25 West 4th

Several Internet access stations will be placed in public areas on campus for a trial run during the spring semester of 1996. These stations — initially to be found at Bobst Library (B level), Loeb student center, and the study lounge at 25 West 4th Street — will provide access to student e-mail accounts and the World-Wide Web. President Oliva has approved this computing initiative in response to increased student demand and interest in academic computing.

These access stations are an experiment. We encourage you to try them out and let us know how you like them. Your feedback will help us make the next generation as usable and useful as possible. Please send your observations by e-mail to comment@nyu.edu.

— Amy E. Hernández

*amy.hernandez@nyu.edu*

Amy Hernández is the ACF coordinator for Distributed Computing.
ACF Accounts and Services

How to Get What You Need: A Hassle-Free Guide to ACF Accounts and Services

Shaaron P. Francis
shaaron.francis@nyu.edu

A broad, sometimes confusing, array of ACF services is available to the NYU community. Among other services, there are class accounts to facilitate

Shaaron P. Francis is Manager of Business and Administration for ACF.

Where to Go for ACF Services

To find the ACF computer labs, see the map on page 45. Warren Weaver Hall, at 251 Mercer Street, houses both the ACF Accounts Office (room 305; 998-3035) and the HelpCenter (2nd floor; 998-3333).

To open an NYU Internet and e-mail account:

Facility and staff: Contact the ACF Accounts Office.
Students: Go to any ACF computer lab with your valid NYU ID.

To change a forgotten password:
You must do this in person to ensure that your account is not being compromised by another individual. We do not give out passwords over the phone.
Faculty and staff: Go to the ACF Accounts Office.
Students: Go to any ACF computer lab.

To reopen a suspended account:
ACF Accounts Office. You must speak with the appropriate ACF person regarding reinstatement of your account.

To get a class account:
The instructor applies at the ACF Accounts Office for the entire class, then gives out account information and stickers in class.

To get an individual (research) account:
ACF Accounts Office. You must be sponsored by a department to obtain a shared-system account for course work or research.

To get a DIAL (PPP) account:
ACF Accounts Office. To qualify, you must already have a valid NYU e-mail address. (Note that for DIAL accounts there is a long waiting list. Please do not call to see where you are in the queue; you will be notified by e-mail when your account has been created.)

To get Internet access:
Any ACF computer lab; the new Internet access stations (see page 19); or via modem from your home computer (for software, see next).

To get free software for telecommunications services (Kermit, DIAL) and virus protection:
ACF HelpCenter. Self-service with proper NYU ID. Bring your own formatted disks.

To get printed materials on ACF user software HelpCenter or ACF labs.

To get statistics software:
ACF HelpCenter, by appointment. Call 998-3333 for info on fees and number of disks to bring.

To get help with hardware and software compatibility problems; technical e-mail, Telnet, and Internet problems; or other general questions. Call the HelpLine or visit the HelpCenter.
E-Mail Addresses for ACF Contacts

comment@nyu.edu
To report problems and ask questions about your ACF account, e-mail, or other ACF service.

postmaster@nyu.edu
To report problems or ask questions about sending or receiving e-mail, and to report harassing e-mail exchanges.

accounts@nyu.edu
To ask administrative questions about your ACF account.

modems@nyu.edu
To ask questions about modems and dialing into NYU-NET.

modem, we recommend that you use ACF communications software for greatest compatibility.

In the ACF Business and Administration group, we are trying to make the task of getting an account and finding the information you need as simple and clear as possible. Our goal is to limit the number of calls and the amount of paperwork you need to open and maintain a computer account at NYU.

Network and Computer Users' Responsibilities

When you use any service on campus, you are asked to be responsible for many rules and regulations, often spelled out in print. ACF is no exception. All users are expected to use the network in a responsible manner. The world of computing is opening up in new and exciting ways, but a few paradigms are emerging and need consideration by all users. Here are some of them:

• Do not conduct any commercial dealings via your NYU account — this means no selling of goods or services either by you, as the user, or by a second party.

• Do not conduct any illegal activity of any kind. Specifically, do not harass or stalk another user, either at NYU or outside of the University, via your account.

• Do not copy software, install software, or reconfigure ACF machines or systems without explicit authorization.

• Do not “spam” — that is, do not send the same message to more than one or two newsgroups. (Rules for newsgroups and general “netiquette” are available by pointing your news reader at netnews.nyu.edu and going to the group news.announce.newusers.)

• Be courteous to other users (a good rule of thumb is, If you don't want something done to you, others will find it offensive as well).

• Be aware that while we expect every user to use discretion in all electronic dealings, there are some users who forget their manners. We do not censor general conversations, but do encourage good judgment.

Your ACF account is intended to support your academic pursuits, and to assist in administrative efforts across the University. This account is a privilege afforded you by your affiliation with the University. If you abuse this privilege, you may lose your account, temporarily or permanently.

Where to Find ACF Documents on NYU Web

Visit the ACF home page on the NYU Web (at http://www.nyu.edu/acf/) and select Getting an Account and Accounts Office to find information about how to get an ACF account, and to read relevant documents (Responsibilities of a Computer or Network User, of a DIAL Account User, etc.).

The Account Office handles tremendous numbers of general questions every day, and so of course does the HelpLine. We encourage you to go to our Web pages whenever you need information on ACF resources. It may be the fastest way to find what you're looking for!

**ACF HelpLine Q&A**

Q: How can I quickly report what might be a networking problem, when the HelpLine is busy or closed?

A: It's easier now; a few changes have been made to the HelpLine telephone system.

During our business hours (Monday through Friday, 9 am to 6 pm), we speak with as many people as possible, but some callers have to be put on queue. With this new setup, however, if no one is available to speak with you right away, you can elect to stay on queue, or you can immediately choose an alternative — you can report a network problem, you can leave a message or question for the HelpLine staff, or you can listen to the detailed information menu.

― L. Barnett

Call the ACF HelpLine at 998-3333
### Important Dates for ACF Users

Users of ACF facilities should be aware of the following dates and deadlines, when schedules change, accounts expire, and files must be stored. For schedules and dates of operation of the ACF facilities, see page 45 for information on general, individual, class, and e-mail (NYU-Internet) accounts, see page 44.

<table>
<thead>
<tr>
<th>Month</th>
<th>Date(s)</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>January</td>
<td>Jan. 13–15</td>
<td>Martin Luther King, Jr., Day Weekend</td>
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<td></td>
<td>Jan. 15</td>
<td>Martin Luther King, Jr., Day*</td>
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<tr>
<td></td>
<td>Jan. 22</td>
<td>Spring Semester begins</td>
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<tr>
<td>February</td>
<td>Feb. 17–19</td>
<td>Presidents' Day Weekend</td>
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<td></td>
<td>Feb. 19</td>
<td>Presidents' Day*</td>
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<tr>
<td>March</td>
<td>Mar. 11–16</td>
<td>Spring recess</td>
</tr>
<tr>
<td>April</td>
<td>Apr. 1</td>
<td>Instructors apply for Class Accounts for both summer session.</td>
</tr>
<tr>
<td></td>
<td>Apr. 1</td>
<td>Students who expect Incompletes in spring semester courses should apply for computer account extensions. (Instructor's signature required.)</td>
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<td></td>
<td>Apr. 21</td>
<td>Founders Day</td>
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<td></td>
<td>Apr. 24</td>
<td>Students with spring semester Class Accounts should store all files they wish to keep after May 15.</td>
</tr>
<tr>
<td>May</td>
<td>Through Aug. 31</td>
<td>Individual Account holders not returning for 1996/97 should store files that they wish to keep.</td>
</tr>
<tr>
<td></td>
<td>May 1</td>
<td>Instructors may begin to apply for fall semester computer Class Accounts.</td>
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<td></td>
<td>May 8–15</td>
<td>Spring semester final examinations</td>
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<td></td>
<td>May 15</td>
<td>Student Class Accounts issued for the spring semester expire.</td>
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<td></td>
<td>May 16</td>
<td>Commencement</td>
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<td></td>
<td>May 20</td>
<td>ACF's Summer Hours begin</td>
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<tr>
<td></td>
<td>May 20</td>
<td>Summer Session I begins.</td>
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<td></td>
<td>May 25–27</td>
<td>Memorial Day weekend</td>
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<tr>
<td></td>
<td>May 27</td>
<td>Memorial Day*</td>
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</table>

* University holiday
† Please note: Holiday schedules will be posted on the NYU Web at [http://www.nyu.edu/acf/nyu-events/](http://www.nyu.edu/acf/nyu-events/) and on the ACF online news facilities; they can also be obtained by calling the ACF HelpLine at 998-3333.
The attached Quick Reference desk guide has been designed to bring together the most essential phone numbers, e-mail addresses, contact points, and troubleshooting tips for the members of the NYU community who are connected to NYU-NET, either directly or by modem.

This is the first edition of the guide, and since more and more members of the community are getting direct connections to the network, the ACF wanted to get copies into the hands and onto the desks of as many people as possible.

The best solution seemed to be this: a guide bound into Connect. Now you can tear it out on the perforation, fold it on the scores, fill in the pertinent data about your computer, and put it nearby, to stave off panic attacks, to answer questions, and to tell you which number to call or e-mail address to write to for the fastest response to your problem.

If you want more copies, or would like to suggest improvements to the guide, please send a message to acf.documents@nyu.edu.
Handy NYU-NET Quick Reference Desk Guide

The attached Quick Reference desk guide has been designed to bring together the most essential phone numbers, e-mail addresses, contact points, and troubleshooting tips for the members of the NYU community who are connected to NYU-NET, either directly or by modem.

This is the first edition of the guide, and since more and more members of the community are getting direct connections to the network, the ACF wanted to get copies into the hands and onto the desks of as many people as possible.

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If you want more copies, or would like to suggest improvements to the guide, please send a message to acf.documents@nyu.edu.
Getting Help

During Office Hours
9:00 am to 6:00 pm, Monday through Friday
- Call the HelpLine at 998-3333 to speak with a staff member.
- Visit the HelpCenter at 251 Mercer Street, 2nd floor.
- Send e-mail to comment.

After Office Hours
6:00 pm to 9:00 am, Monday through Friday; Saturday, Sunday and University Holidays
- Call the HelpLine at 998-3333. The automated help system will answer. Leave a message detailing your problem. You will receive a return call within one business day.
- Send e-mail to comment. You will receive an e-mail response in one to two business days.

Network Failures
Getting Information
If you believe there is a network failure, check the following resources for information regarding the problem and expected downtime.
- During office hours, call the HelpLine at 998-3333 and speak with a staff member.
- After hours, call the HelpLine at 998-3333 and request network status information from the automated menu system.
- If you have access to NYU-NET or to the Internet, use the finger command to look at status@noc.nyu.edu.

Reporting a Network Failure
If you believe that there is a network failure of which ACF is not yet aware, please report the problem in one of the following ways.
- During office hours, call the HelpLine at 998-3333 and tell a staff member.
- After office hours, call the HelpLine at 998-3333. Leave a message in the network status area of the automated menu system. These messages are checked until midnight.
- If you have access to NYU-NET or to the Internet, send e-mail to noc@nyu.edu. Please describe the problem in detail, and include a phone number where you can be reached.

Connecting & Contacting

Dial-in Access to NYU-NET
To connect via modem to NYU-NET, set your modem to 8 data bits, 1 stop bit, full duplex, no parity. If you are dialing in from outside Manhattan, remember to use the 212 area code.

- 300 to 2400 bps
- 9600 to 28,800 bps
- DIAL Accounts only

ACF HelpLine  (212) 998-3333
The ACF HelpLine is open from 9:00 am to 6:00 pm, Monday through Friday. The HelpLine is closed on Saturdays, Sundays and University holidays. When the HelpLine is closed, your call is answered by the automated help service.

E-mail Contacts
comment
- To report problems with your account and make suggestions for improvements in NYU-NET service.
- postmaster
- To report harassing e-mail or other e-mail specific problems.

E-mail to either of these addresses is directed according to the network or machine from which you send the message. If you are e-mailing from a non-ACF account, use the addresses comment@nyu.edu and postmaster@nyu.edu.

Guides
ACF publishes a variety of guides and pamphlets to help you use your NYU-Internet or DIAL account. Printed copies are available at the ACF HelpCenter, 251 Mercer Street, 2nd floor. Electronic copies are on the World-Wide Web at:

http://www.nyu.edu/acf/pubs/

An introduction to NYU Web, the Internet and the World-Wide Web is available online at:

http://www.nyu.edu/webguide/

Classes, Workshops and Talks
Training in many basic aspects of computing is offered by ACF at no charge. Schedules are available from the HelpCenter, 251 Mercer Street, 2nd floor, and on the World-Wide Web at:

http://www.nyu.edu/acf/classes/
Your Computer

In order to help you solve a problem with your computer or network connection, ACF staff members will need some information about your machine. Please fill in the information below and have it handy when you call the HelpLine.

Your e-mail address

Your Office Computer

School/Dept.

Location

Platform:

Network Connection:

Your Home Computer

Platform:

Operating System

Communications Program

Modem: Brand

Speed

Troubleshooting Tips

Login and Passwords

User ID and password not being accepted

Many login procedures treat upper and lower case letters as different characters. If you are having difficulty logging in, check that caps lock is off, then retype your user ID and password.

If your DIAL account user ID and password are not being accepted, there may be a problem with the DIAL password verification. Send e-mail to modems@nyu.edu to report the problem.

Forgotten password

If you have forgotten your password, you must come in person to the ACF with your valid NYU ID to have the account password reset. Students should go to any of the ACF labs. Faculty, staff and administration should go to the ACF Accounts Office at 305 Warren Weaver Hall, 251 Mercer Street between 9:00 and 5:00. If you have forgotten your DIAL account password, send e-mail to modems@nyu.edu requesting that the password be reset.

Changing your DIAL password

We recommend changing your password at least twice a year. To change your DIAL account password:

1. Telnet to the address dialpw.nyu.edu
2. Login with user ID dialpw
3. When prompted, type in your current DIAL password
4. When prompted, type in a new password

Use the new password the next time you log in to your DIAL account.

Office Connections

Physical cable connection

Check that the cables are connected and undamaged.

NIU connection

An NIU connection is indicated by a double-arrow prompt in Kermit. If you have lost the double-arrow prompt, or have the prompt but cannot connect to NYU-NET, call the HelpLine (998-3333).

Modern Connections

General modem problems

If you are using an external modem, check that it is turned on. Check that the phone line connected to the modem has a dial tone. Check that the telephone cable is properly connected to the wall jack and to the modem. If there are multiple jacks on your modem, check that the cables are connected appropriately.

"BUSY" message

When every modem in the NYU modem pool is in use, you will get a busy signal. Try dialing in again later. If you have a high-speed modem, try connecting to the low-speed number.

"NO CARRIER" message

If you have call-waiting on the telephone line you are using to connect to NYU-NET, your connection may be interrupted by incoming calls. When connecting to NYU-NET, turn off call-waiting by adding *70, in front of the dial-up number. For example, if you are connecting to the low-speed number, dial *70,9953600.

No answer

The modem pool you are connecting to may be out of service. If you have a high-speed modem, try connecting to the low-speed number. Report the problem to the HelpLine (998-3333).

Gibberish appears on the screen

This may be caused by line noise, or your modem and NYU's modem may be set to different data speeds or error correction methods. Hang up and dial again.

No response when dialing in to the DIAL modem pool

Password verification may be failing. Send e-mail to modems@nyu.edu or call the HelpLine (998-3333) to report the problem.

Internet Applications

On Macintosh, "That pesky MacTCP is acting up again" message when trying to run an application

There may be a problem with some of your control panel settings. Check the settings in the MacTCP and Network control panels.

On Windows 3.x, an error message regarding IP address, Bootp table or Winsock when trying to run an application

Restart Windows and open Trumpet Winsock.

• Connecting from an NYU office, your IP address should appear at about the sixth or seventh line in the Trumpet Winsock window. If it does not, call the HelpLine (998-3333).
• Connecting from home, dial into NYU modems. Your IP address should follow the DIAL user authentication section. If it does not, call the HelpLine (998-3333).

Once you are successfully connected, you may minimize the Trumpet Winsock window, but do not close it.

In Telnet, "Unable to resolve (hostname)" message

Try using the full name of the machine, for example, is3.nyu.edu instead of just is3. If you still get the "unable to resolve" message, try opening a telnet connection to another machine, such as bobcat.nyu.edu. If you can telnet to another machine, then your host machine may be down. Call the HelpLine (998-3333) or send e-mail to comment to report the problem.
New Statistical Modules for Marketing Research and Time-Series Analysis

Robert A. Yaffee
robert.yaffee@nyu.edu

SPSS (Statistical Package for the Social Sciences) is one of the most popular computer packages for statistical analysis in universities around the world today. It is a very user-friendly package, and thus useful for the beginning student learning how to apply statistics in the social sciences. The Academic Computing Facility makes SPSS available in three ways: it offers SPSS for Windows in its PC labs, and SPSS for Unix on its statistical server, an IBM RS6000/C-20 designated stats1.acf.nyu.edu. It also maintains a site license for distribution of the SPSS for Windows package to students, research staff, and faculty for a nominal fee.

The ACF has recently acquired several new statistical modules for use with SPSS for Windows:

- The Trends module (discussed below) permits analysis of time series.
- The Exact Test module calculates exact probabilities for significance levels when the conventional statistical assumptions of normality and large sample size do not hold. When data are non-normally distributed, sparsely distributed, badly skewed, very unbalanced, or small in sample size, researchers would be able to use this module for proper estimation.
- Marketing researchers will find market-segmentation analysis possible with the new chi-square automatic interaction detection among categorical variables provided by the Chaid module.
- They may also find the new Correspondence and Conjoint analysis contained within the new Categories module useful.

SAS or SPSS? Windows or Unix?

If the user has small data sets or is a beginning student, SPSS is often the statistical package of choice; for such a person, the MS Windows version is easier to use than the Unix one. SPSS for Unix can run on the RS6000/C-20 in batch mode, but for graphics the user must have access to an X-Windows terminal or to an X-Windows emulator running on a desktop computer. One such emulator, Micro X-Windows, is available on the Gateway PCs in the ACF computer labs in Tisch Hall (room LC-8), 14 Washington Place, and Third Avenue North.

SPSS running under Micro X-Windows may be too slow for many people. For researchers with large data sets and more complex statistical analyses, SAS, the Statistical Analysis System, may be the better package. Running under either MS Windows or Unix, SAS is currently more powerful than SPSS, as well as more complicated. On both systems, SAS has better graphing capabilities.

- Both marketing researchers and forecasters may choose to experiment with market-data segmentation and forecasting, using the new neural-networks package called Neural Connections.

Let's consider the modules for time-series analysis and neural networks in greater detail.

Time-Series Analysis

SPSS’s Trends module contains a number of statistical techniques useful in time-series analysis. Trends contains sequence and time-series plots so

Dr. Yaffee is a statistical consultant at the ACF.
the user may plot the data. It permits seasonal decomposition for those data series with clear seasonal components, allowing the selection of additive or multiplicative components of trend, seasonality, cycle, or error. The X-11 procedure allows for Census II seasonal adjustment of the data. The exponential-smoothing procedure may be used to utilize the most recent data for the purpose of forecasting. For those who prefer to analyze continuous data, spectral analysis is available in this module as well.

ARIMA and regression techniques are available. The ARIMA (autoregressive integrated moving average) procedure permits identification, estimation, diagnosis, metadiagnosis, and forecasting. For series afflicted with first-order autocorrelation, there is the autoregression procedure. For series afflicted with serious heteroskedasticity problems, there is the weighted least-squares regression procedure. For series with serious multicollinearity and simultaneity, there is the two-stage least-squares regression procedure, which may be used when proxy variables are available.

The Trends module under Windows produces textual and graphical output that can easily be incorporated in word-processing documents. The module has also been added to the SPSS under Unix on the ACF’s IBM RS-6000/C-10 computer. A series of lectures on the use of the Trends is planned for the fall of 1996.

Neural Networks

Attempts to develop computer models of the perceptual and other cognitive processes of the brain have led to the development of computer programs that can read, learn, generalize, and adapt. These neural networks complement conventional statistical techniques for complex, nonlinear classification, clustering, prediction, and time-series modeling. When the data are “noisy,” the new SPSS Neural Connections module, albeit computationally intensive, may outperform conventional models built for these purposes. According to Tony Babinec, SPSS Director of Business Development, these algorithms may facilitate model exploration, construction, and refinement of models, and hence increase understanding and productivity.

Fundamentally, neural networks consist of basic components called neurons between which connections are formed. Functionally, the neurons are arrayed in three types of layers — input, hidden, and output. Three layers is a bare minimum for analyzing nonlinear problems, and there are often several hidden layers.

In Neural Connections, icons on the computer screen serve as manipulable symbols for input data, smoothing, filtering, modeling, or forecasting processes. The decision function may be depicted in a graph.

In the first phase of the iterative model-building cycle, the data are preprocessed. The neural net first transforms input and target variables to make them utilisable. Categorical and date-formatted variables are converted to numeric variables. Non-normal variables are deskewed. Input variables are standardized, while outliers are clipped.

In the second phase, the neural net divides the data set into three subsets, one of which it will use for training, one for validation, and one for testing.

During the third phase, the neural net uses training data to form a system of connections between the layers of neurons for segmentation, classification, or prediction of the target (output) variable values.

As the network of connections is built between the layers, each connection is assigned a statistical weight. Input layers are stimulated by software algorithms to send signals to hidden layers. As a signal is sent through each connection, it is multiplied by the connection weight. Stimulated neurons receive signals from preceding layers of neurons and from a bias neuron. They sum these signals, subject this sum to a statistical transformation, and transmit the result to neurons in subsequent layers. The output of these neurons is a function of the net structure and the connection weights.

When the signaled output value is subtracted from the actual data value, the residual is an error. Errors are fed back from the output to the hidden layers for corrective adjustment of the connection weights to minimize the sum of squared errors. Training of the net takes place through this iterative feedforward of signal and feedback of the errors until a convergence of target with actual values takes place.

In the validation phase, the network is run with the validation data subset, in order to minimize overfitting the net to the peculiarity of the training sample. As the net is trained, errors of both training and validation decline. After a point, though, the validation error begins to increase; the optimal network configuration holds at the point of mini-
A three-dimensional graph produced in SPSS's Neural Connections module represents decision output as a function of two inputs: age and maximum bank balance. The graph can be rotated as desired.

A detailed index with text search tools is available on ICPSR's World-Wide Web page:
http://icpsr.umich.edu/
Most of this data and documentation — U.S. census enumerations, crime statistics, national longitudinal health surveys, for example — may be ordered through us and are then available over the Internet almost instantly. ICPSR houses the National Archive of Computerized Data on Aging (NACDA) and the National Archive of Criminal Justice Data (NACJD). The ACF's Statistics and Social Science Home Page:
http://www.nyu.edu/acf/socsci/
provides links to ICPSR and order forms for the data, which are free NYU researchers.

**ICPSR Summer Program**

ICPSR has a summer program in quantitative research methods at the University of Michigan in Ann Arbor, offering a comprehensive, integrated program of studies in research design, statistics, data analysis, and social methodology. Basic methodological and technical training is offered, along with opportunities for advanced work in specialized areas. Topics include: Game Theory, Regression, GIS, Hierarchical Linear Models, Logit and Log-Linear Models, LISREL, Chaos, Time Series, Categorical Data Analysis, Jackknife and Bootstrapping, Missing Data, Bayesian Modeling.

The ACF's Statistical group makes small assistance awards to help defray costs; therefore interested researchers and students should make application through the Statistical group early.

For a copy of the 1996 ICPSR Summer Program brochure and application, use Lynx or Netscape the Stats group home page. You can get there from the NYU-Web home page by clicking on Facilities & Resources, Computing Facilities, and then Social Sciences, or type in the URL given above.

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**Access**

Persons interested in purchasing any of these SPSS these modules should call Jane DelFavero at the ACF Help Center on the second floor of Warren Weaver Hall at 998-3333. Those seeking technical assistance with modules may contact me at 998-3402 or by e-mail at the above address.

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**Statistical Data from ICPSR**

NYU is a founding member of the Inter-University Consortium for Political and Social Research. ICPSR gives university researchers access to thousands of sets of machine-readable social science data and documentation, while acting as a national archive. Value is added to these data through access tools and by assuring that corrections are incorporated.

A detailed index with text search tools is available on ICPSR's World-Wide Web page:
http://icpsr.umich.edu/
Most of this data and documentation — U.S. census enumerations, crime statistics, national longitudinal health surveys, for example — may be ordered through us and are then available over the Internet almost instantly. ICPSR houses the National Archive of Computerized Data on Aging (NACDA) and the National Archive of Criminal Justice Data (NACJD). The ACF's Statistics and Social Science Home Page:
http://www.nyu.edu/acf/socsci/
provides links to ICPSR and order forms for the data, which are free NYU researchers.

**ICPSR Summer Program**

ICPSR has a summer program in quantitative research methods at the University of Michigan in Ann Arbor, offering a comprehensive, integrated program of studies in research design, statistics, data analysis, and social methodology. Basic methodological and technical training is offered, along with opportunities for advanced work in specialized areas. Topics include: Game Theory, Regression, GIS, Hierarchical Linear Models, Logit and Log-Linear Models, LISREL, Chaos, Time Series, Categorical Data Analysis, Jackknife and Bootstrapping, Missing Data, Bayesian Modeling.

The ACF's Statistical group makes small assistance awards to help defray costs; therefore interested researchers and students should make application through the Statistical group early.

For a copy of the 1996 ICPSR Summer Program brochure and application, use Lynx or Netscape the Stats group home page. You can get there from the NYU-Web home page by clicking on Facilities & Resources, Computing Facilities, and then Social Sciences, or type in the URL given above.

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**Frank LoPresti**

lopresti@nyu.edu
The Academic Computing Facility provides a broad range of software for scientific computing, visualization, and graphics on platforms ranging from PCs to high-performance parallel computers. The Scientific and Visualization group continually evaluates new programs and makes available the ones that are likely to be useful to the NYU research community. (For similar statistical and GIS software, please contact Frank LoPresti at 998-3398.) Most of the programs now available are listed on the following pages.

**Platform, Origin, and Type**

The programs are grouped in tables according to the various platforms on which they run.

The software comes from a large variety of commercial, academic, and governmental sources. Several packages come from the supercomputer centers supported by the National Science Foundation; those and other government sources are listed in the accompanying box, and abbreviated under Origin in the tables.

Much of the software in these tables is governed by licensing restrictions; the appropriate licenses are maintained by the ACF. Researchers should be aware of the restrictions, since a project that is to be run elsewhere might require the use of a program that is licensed. For that reason, public-domain or shareware programs are used whenever possible.

**The Software Spectrum**

The wide spectrum of scientific software at the ACF ranges from easy-to-use plug-and-play, general- and special-purpose packages, through powerful toolboxes and utilities, to programming languages and large collections of libraries.

An example of an easy-to-use graphics package is Tecplot. Users can easily import information, such as data sets or images. Using a fully developed graphical user interface (GUI) and a point-and-click menu bar, a researcher can visualize, annotate, and print high-resolution color plates for study, distribution to colleagues, or publication.

Several special-purpose computational biochemistry packages coupled with powerful visualization techniques are available. They facilitate the importation, modification, and modeling of molecular structures and allow students and researchers to easily rotate, pan and zoom molecules in three-dimensional space in real-time as well as perform complex calculations such as minimization.

This rapid prototyping and manipulation of new structures replaces the expensive, cumbersome, time-consuming construction of models; it thus allows the users to focus their attentions on the problems under investigation.

Toolboxes often are an integral part of many programs, allowing users to combine several programs for specific tasks.

**Explanations: Origin and Type**

These government bodies are abbreviated in the tables under Origin.

- NCAR: National Center for Atmospheric Research, Boulder, Colorado
- NCSA: National Center for Supercomputing Applications, Urbana-Champaign, Illinois
- PSC: Pittsburgh Supercomputer Center, Pittsburgh, Pennsylvania
- SDSC: San Diego Supercomputer Center, San Diego, California
- NIST: National Institute for Science and Technology's Department of Commerce (formerly NBS: National Bureau of Standards)

Several types of programs are maintained and licenses by the ACF:

- (Pr) Proprietary: Intellectual property copyright by the producer and licensed or leased out for a fee. Usually only the executable (binary) file is available — not the source code.
- (Sh) Shareware: Software owned and copyright by the vendor but made available for a nominal fee, with no expectation that the user will pay fees in the future for new releases or updates. Only the executable file is available.
- (PD) Public Domain: Usually owned and copyright by the producer but distributed freely. Often the source code is available.
part of a package. This is true for AVS, a visual programming environment where the end user assembles powerful modules to build an application. The use selects modules from a menu, drags them to an active “desktop” on the screen, and interconnect them into a network. Information then flows into this network, which invokes the modules as needed to perform some task, computational or graphical. Researchers in the life sciences have used this dataflow technique to process and display CAT and MRI data.

Programming languages such as C, Fortran, and C++ allow users to build their own customized applications. Such applications often invoke libraries of specialized subroutines to solve mathematical problems, and libraries of graphics routines to display the results. A Fortran program could invoke both the NAG and NCAR libraries. This approach takes time, but allows researchers to control and modify their applications easily.

Parallel programs can be developed by using precompilers such as xHPF or by including library calls to a collection of subroutines. Automatic parallelizers such as xHPF perform the appropriate decomposition of the problem into a number of pieces to be distributed to different processors. Invoking library calls to the PVM system creates several modules. At the time of execution, a number of processors are automatically invoked. Gaussian 94 automatically uses multiple processors for computationally intense calculations after the user defines the problem input.

Utilities and tools such as the Image Tools, XV, and Ghostscript permit the manipulation and transformation of images from one format to another. For example, if an image in TIFF format is to be printed, it can be converted into PostScript by the

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### Scientific Software at the CAPC

The following software is available at the ACF's Center for Applied Parallel Computing, which has two major components:

#### The IBM RS/6000 Cluster

The IBM cluster consists of seventeen RS/6000 machines configured as a distributed-memory multiprocessor.

<table>
<thead>
<tr>
<th>Software</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concert C</td>
<td>Pr</td>
<td>IBM Yorktown</td>
</tr>
<tr>
<td>DataExplorer (scientific visualization)</td>
<td>Pr</td>
<td>IBM Yorktown</td>
</tr>
<tr>
<td>DMP (distributed-memory parallelizer)</td>
<td>Pr</td>
<td>APR, Inc.</td>
</tr>
<tr>
<td>dqs (scheduler)</td>
<td>Sh</td>
<td>SCRI/Florida State U.</td>
</tr>
<tr>
<td>Forte 90 (HPC tools)</td>
<td>Pr</td>
<td>IBM; NAG, Ltd., Oxford</td>
</tr>
<tr>
<td>Fortran90 (compiler)</td>
<td>Pr</td>
<td>Gaussian, Inc.</td>
</tr>
<tr>
<td>Gaussian 94</td>
<td>Pr</td>
<td>Gaussian, Inc.</td>
</tr>
<tr>
<td>LAPACK (linear algebra)</td>
<td>PD</td>
<td>SIAM, ORNL</td>
</tr>
<tr>
<td>Matlab</td>
<td>Pr</td>
<td>The MathWorks</td>
</tr>
<tr>
<td>NAG Library (math library)</td>
<td>Pr</td>
<td>NAG, Ltd. Oxford</td>
</tr>
<tr>
<td>NCAR Graphics version 4.0</td>
<td>Sh</td>
<td>NCAR/NSF</td>
</tr>
<tr>
<td>Netscape</td>
<td>Pr</td>
<td>Netscape, Inc.</td>
</tr>
<tr>
<td>Network Linda &amp; C</td>
<td>Pr</td>
<td>Scientific Computing</td>
</tr>
<tr>
<td>Paraffort Express (parallel prog.)</td>
<td>Pr</td>
<td>Parasoft Corporation</td>
</tr>
<tr>
<td>Petsc (partial differential eqns.)</td>
<td>PD</td>
<td>William Gropp, Barry Smith</td>
</tr>
<tr>
<td>PVM (parallel programming)</td>
<td>PD</td>
<td>U. of Tenn., ORNL &amp; Emory U.</td>
</tr>
<tr>
<td>PVMe (parallel programming)</td>
<td>Pr</td>
<td>IBM, Endicott</td>
</tr>
<tr>
<td>p4 (parallel programming)</td>
<td>PD</td>
<td>Argonne National Laboratory</td>
</tr>
<tr>
<td>p7 (low-level library)</td>
<td>Pr</td>
<td>IBM, Endicott</td>
</tr>
<tr>
<td>Spartan (chemistry, biology)</td>
<td>Pr</td>
<td>Wavefunction, Inc.</td>
</tr>
<tr>
<td>XHPF (automatic parallelizer)</td>
<td>Pr</td>
<td>APR, Inc.</td>
</tr>
</tbody>
</table>

#### The SGI Power Challenge

The Silicon Graphics Power Challenge L (called Copernicus), a four-processor shared-memory machine, has these programs:

<table>
<thead>
<tr>
<th>Software</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biosym (Insight, Discover)</td>
<td>Pr</td>
<td>Biosym Technologies</td>
</tr>
<tr>
<td>Complib. sgimath</td>
<td>Pr</td>
<td>Silicon Graphics</td>
</tr>
<tr>
<td>Gaussian 94</td>
<td>Pr</td>
<td>Gaussian, Inc.</td>
</tr>
<tr>
<td>LSF (scheduler)</td>
<td>Pr</td>
<td>Platform Computing Co.</td>
</tr>
<tr>
<td>Matlab</td>
<td>Pr</td>
<td>The MathWorks</td>
</tr>
<tr>
<td>NCAR Graphics 4.0</td>
<td>Sh</td>
<td>NCAR/NSF</td>
</tr>
<tr>
<td>Netscape</td>
<td>Pr</td>
<td>Netscape, Inc.</td>
</tr>
<tr>
<td>PFA, PCA (parallel Fortran and C compilers)</td>
<td>Pr</td>
<td>Silicon Graphics</td>
</tr>
<tr>
<td>Spartan</td>
<td>Pr</td>
<td>Wavefunction, Inc.</td>
</tr>
<tr>
<td>Xplor</td>
<td>Pr</td>
<td>Yale U.</td>
</tr>
</tbody>
</table>
utility XV. The PostScript file can then be viewed using Ghostscript.

For details on any of these applications, please contact Ed Friedman by phone at 998-3051 or by e-mail at the address above.

Write Your Own CDs via Young Minds CD Studio

The ACF now has an easy-to-use UNIX-based compact disk recorder available for those who need to store or distribute massive amounts of data. CD Studio, from Young Minds, is capable of recording up to 650 megabytes onto a single blank CD in under 20 minutes in a single session. At this point, it is not possible to append information from multiple sessions. Some of the possible uses are

- Recording permanent copies of critical experimental or empirical data.
- Recording the output of very long computer simulations
- Storage of scanned or fabricated digital images similar to a Kodak Photo CD.
- Making multiple copies of locally developed application codes and data for distribution or archiving.

The system is located in the Scientific Computing bay of the Innovation Center on the second floor of Warren Weaver Hall. To gain access to CD Studio, users need to have an account on the Science SGI Cluster and also must provide their own blank CD media. The current cost is about $10.00 for a 74-minute blank CD, capable of holding up to 650 megabytes of information.

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Software at the Scientific Visualization Center

Software running on the Silicon Graphics machines at the Scientific Visualization Center (Warren Weaver Hall, room 317):

1. General Purpose and Scientific Visualization

<table>
<thead>
<tr>
<th>Software</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVS</td>
<td>Pr</td>
<td>Advanced Visual Systems, Inc.</td>
</tr>
<tr>
<td>Explorer</td>
<td>Pr</td>
<td>NAG (Numerical Algorithms Group)</td>
</tr>
<tr>
<td>Gplot</td>
<td>PD</td>
<td>PSC/NSF</td>
</tr>
<tr>
<td>HDF</td>
<td>PD</td>
<td>NCASA/NSF</td>
</tr>
<tr>
<td>Image Tools</td>
<td>PD</td>
<td>SDSC/NSF</td>
</tr>
<tr>
<td>Khoros/DIPcourse</td>
<td>PD</td>
<td>U. of New Mexico</td>
</tr>
<tr>
<td>Matlab</td>
<td>Pr</td>
<td>The MathWorks, Inc.</td>
</tr>
<tr>
<td>Netscape</td>
<td>Pr</td>
<td>Netscape, Inc.</td>
</tr>
<tr>
<td>NCAR Graphics 4.0</td>
<td>Sh</td>
<td>NCAR/NSF</td>
</tr>
<tr>
<td>NetCDF</td>
<td>PD</td>
<td>UCAR/NSF</td>
</tr>
<tr>
<td>SciAn</td>
<td>Sh</td>
<td>SCRI/Florida State U.</td>
</tr>
<tr>
<td>SoftImage</td>
<td>Pr</td>
<td>SoftImage/Microsoft, Inc.</td>
</tr>
<tr>
<td>Tecplot</td>
<td>Pr</td>
<td>Amtec Engineering, Inc.</td>
</tr>
<tr>
<td>Transform</td>
<td>Pr</td>
<td>Spyglass, Inc.</td>
</tr>
<tr>
<td>VolVis</td>
<td>Sh</td>
<td>SUNY, Stony Brook</td>
</tr>
</tbody>
</table>

2. Biology, Chemistry, and Medical Sciences

- Amber
- Chain
- Chem-X
- FRODO
- Gaussian 94
- Insight/Discover
- Macromodel
- MDMovie
- Quanta
- Rasmol
- Spartan
- VMD/NMD
- Xmol
- Xplor

3. Physical Sciences, Mathematics, and Engineering

- Complib.sgimath
- Gasp(Geometry)
- Geomview
- Leda
- Mathematica
- Minnview
- Visual3 (fluid flow)
- Vogl (engineering)

4. Geographical Information Systems (GIS)

<table>
<thead>
<tr>
<th>Software</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>ArcInfo, ArcView</td>
<td>Pr</td>
<td>ESRI</td>
</tr>
<tr>
<td>Grass, XGrass</td>
<td>Sh</td>
<td>US Army Corps of Engineers</td>
</tr>
</tbody>
</table>
Developments in Visualization Software: It’s on the Web

For many researchers, the most exciting development over the past year or so is the degree to which the World-Wide Web has become a nearly essential companion tool to scientific visualization and research. Most software systems now have sites on the Web, where information and help with the software can be easily obtained. Interactive e-courses and class syllabi have appeared from universities all over the globe. Research scientists have created sites as well, where their papers from conferences such as IEEE Visualization can be viewed or downloaded at the push of a button. The result is a very stimulating (almost overwhelming) global scientific community where information is easily available at levels of speed and completeness never experienced before.

Many of the new and recently updated software systems available at the ACF Scientific Visualization Laboratory take advantage of the Web in various ways which I will point out below.

AVS (Advanced Visual Systems) has been reintroduced to the ACF’s cluster of SGI computers. It is the oldest of the “visual programming” systems. Icons that represent modules — each module can be a program or sets of programs — are dynamically linked together to form networks which, when activated, produce a result such as a visualization of the calculation on the underlying data. Many modules are part of the basic system, but over the years an extensive library of modules written by users has been accumulated in many applications. See http://www.avs.com/ for more information.

DIPcourse (Digital Image Processing course) is an interactive course that uses the WWW and the modular programming software Khoros to teach about digital image processing and the use of Khoros itself. Its home page can be found at http://www.khoros.unm.edu/dipcourse/ (Please note that any URL, including those listed here, should be typed without breaks) SGI’s modular programming package Explorer has now

### Scientific Software on Other Shared ACF Systems

Software that runs on other Unix-based shared computers, such as the DEC5900 systems ACF2 and ACF4:

<table>
<thead>
<tr>
<th>Software</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMLIB</td>
<td>PD</td>
<td>NIST</td>
</tr>
<tr>
<td>Macsyma</td>
<td>Pr</td>
<td>Symbolics, Inc.</td>
</tr>
<tr>
<td>Maple</td>
<td>Pr</td>
<td>Waterloo Maple Software</td>
</tr>
<tr>
<td>Mathematica</td>
<td>Pr</td>
<td>Wolfram Research, Inc.</td>
</tr>
<tr>
<td>Mongo (Plot Package)</td>
<td>Pr</td>
<td>MIT</td>
</tr>
<tr>
<td>NAG Library</td>
<td>Pr</td>
<td>NAG, Ltd.</td>
</tr>
<tr>
<td>NCAR Graphics 4.0</td>
<td>Sh</td>
<td>NCAR/NSF</td>
</tr>
<tr>
<td>NetLib</td>
<td>PD</td>
<td>ORNL and U. of Tenn.</td>
</tr>
<tr>
<td>Netscape</td>
<td>Pr</td>
<td>Netscape, Inc.</td>
</tr>
</tbody>
</table>

### Scientific Software for Microcomputers

**Macintosh:** On most of the ACF Macintosh servers, a folder called *Science and Mathematics* contains software for the scientific community for use in instruction and research. Most of the programs can be used for analysis and visualization. They include:

<table>
<thead>
<tr>
<th>Software</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyzer</td>
<td>Pr</td>
<td>Springer-Verlag from Cornell U.</td>
</tr>
<tr>
<td>f(g) Scholar</td>
<td>Pr</td>
<td>Future Graph, Inc.</td>
</tr>
<tr>
<td>MacMath</td>
<td>Pr</td>
<td>Springer-Verlag from Cornell U.</td>
</tr>
<tr>
<td>MacMovie</td>
<td>Pr</td>
<td>Brigham Young U.</td>
</tr>
<tr>
<td>Maple</td>
<td>Pr</td>
<td>Waterloo Maple Software Co.</td>
</tr>
<tr>
<td>MathCad</td>
<td>Pr</td>
<td>MathSoft</td>
</tr>
<tr>
<td>Mathematica</td>
<td>Pr</td>
<td>Wolfram Research, Inc.</td>
</tr>
<tr>
<td>Matlab</td>
<td>Pr</td>
<td>Mathworks, Inc.</td>
</tr>
<tr>
<td>NCSA Image</td>
<td>PD</td>
<td>NCSA/NSF</td>
</tr>
<tr>
<td>NIH Image</td>
<td>PD</td>
<td>National Institutes of Health</td>
</tr>
<tr>
<td>OzTeX</td>
<td>Sh</td>
<td>A. Trevorrow, Australia</td>
</tr>
<tr>
<td>Spyglass (Transform, View, Dicer, Format)</td>
<td>Pr</td>
<td>Spyglass, Inc.</td>
</tr>
<tr>
<td>STELLA II</td>
<td>Pr</td>
<td>High Performance Systems, Inc.</td>
</tr>
</tbody>
</table>

**PCs:** Available from all ACF lab PC servers:

<table>
<thead>
<tr>
<th>Software</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matlab</td>
<td>Pr</td>
<td>Mathworks, Inc.</td>
</tr>
<tr>
<td>Available on a PC in the Innovation Center (Warren Weaver Hall, 201):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ArcView</td>
<td>Pr</td>
<td>ESRI (Environmental Systems Research Institute)</td>
</tr>
</tbody>
</table>
come under the domain of NAG (Numerical Algorithm Group). The ACF has purchased four licenses for this software. For more information, see

http://www.nag.com/1/IEC

Roger Crawfis, Barry Becker, and Nelson Max of Lawrence Livermore Laboratory's scientific visualization group use Explorer as well as SGI's library of 3-D graphics and manipulators called Open Inventor. They have created an excellent home page, offering images, movies, and Explorer modules they've developed in their research related to the visualization of fluid flow. See

http://www.llnl.gov/graphics/

for this free software.

GEOMVIEW/OPENGL software system from the University of Minnesota's Geometry Center is a very powerful interactive geometry program for visualizing 3-dimensional as well as n-dimensional objects. Objects for use with VRML (WWW's Virtual Reality Markup Language) objects can be built from this program also. See

http://www.geom.umn.edu/software/download/geomview/

LEDA is "a library of the data types and algorithms of combinatorial computing" and is implemented in the object-oriented programming language C++. See

file://local/LEDA/leda.html

on the science SGI cluster machines for more information.

The updated VolVis 2 (Volume Visualization) software system has been installed on our computers. VolVis, from Arie E. Kaufman's group at SUNY Stony Brook, and it renders images by using voxel (3-D pixel) data. Voxels are usually obtained from 2-D slice data such as NMR scans.

http://www.cs.sunysb.edu/~volvis/vislab.html

discusses this program.

VMD/NMD, from the Theoretical Biophysics Group at the Beckman Institute at University of Illinois.

VMD (Visual Molecular Dynamics) is shareware available on the Internet. The program renders high-quality visualizations for many of the biological and chemical data formats. Beyond its use for 3-D rendering, it can produce stereoscopic and virtual-reality images. See

http://www.ks.uiuc.edu/Research/vmd/

Its companion program NAMD is a parallel program for "molecular dynamics simulations" of large biological systems. This is available at

http://www.ks.uiuc.edu/Research/namd/

VMD can be used to interactively display the results of the simulation from NMD.

GASP, developed at Princeton University by David Dobkin and Ayellet Tal, is "an algorithm animation system for 3-D geometric algorithms." It is built on top of SGI's Open Inventor and has been successfully used in a number of computational-geometry video projects. Animations depicting complex algorithms can be created in a matter of hours. I haven't found a Web site for GASP, but there may well be one soon.

For more information, send e-mail to scvis@archimedes.nyu.edu or check the ACF's science and visualization Web site at

http://www.nyu.edu/acf/science.html

— Estarose Wolfson
estarose@nyu.edu

At the ACF, Estarose Wolfson worked in the area of scientific visualization, providing support to students and researchers in this important technology. She has left to join Dr. David Schwartz in the Department of Chemistry as a research scientist on sequencing the human genome.

NetBill (continued from page 5)

Completing a similar transaction on the Internet, however, brings up new issues: things have been much more freewheeling on the Internet than on the telephone lines; it seems easier for a message to be intercepted; we've read about hackers breaking into computer systems over the network; and therefore it may seem less than prudent to type one's credit-card number into a computer for transmission over the network.

The problems are not insurmountable, though, any more than the problems of a telephone-based transaction are. Visa and MasterCard have recently announced agreement on standards for online transactions. We'll soon see how well the standards work.

Professor Sirbu pointed out another aspect to the problem, though: credit-card transactions are moderately expensive (something like fifteen cents per transaction), and someone has to pay them — usually the vendor, as part of the percentage charged by the card company. But if the promise of the Web is to be fulfilled, there will have to be many small transactions, each too small (pennies to a few dollars apiece) to merit trotting out the credit card.

Here's where NetBill can be useful. The NetBill protocol, developed at Carnegie Mellon University, will let you identify a product you want to buy (say an article) and ask the vendor for a price quote. The vendor then can check your status and give you a quote — list, discount, free (if you're a subscriber), premium (during a time of heavy traffic), or whatever. (All the relevant messages are encrypted and secure. In all but one of these exchanges, you are talking directly to the vendor — or rather, your respective communications programs are talking, using the Net-
The Electronic Journal: Is It Becoming Academically Respectable?

Andrew Gessner
gessnera@elmer1.bobst.nyu.edu

In a recent issue of Connect, the concept of electronic journals was discussed ("The Electronic Journal: Is It Here to Stay?" Summer 1995). Specifically, the article compared the electronic journal to its print equivalent, discussed the pros and cons of electronic versus print publishing, and identified the unique problems this emerging form of scholarly communication presents to the modern researcher. One of the issues to be discussed in more detail here is the full incorporation of electronic journals into the world of scholarly research.

Due in part to the factors discussed in the earlier article — namely economics, space, and access — the continued growth of electronic journals is inevitable. Add to these factors the explosive growth in the development and use of World-Wide Web browsers and the technology’s great facility with graphics, and it is easy to see why many new users and publishers are being enticed into the world of electronic journals. The high bandwidth (carrying capacity) of the Internet, coupled with efficient algorithms to compress image files to manageable sizes, also make transmission of graphics practical.

Nonetheless, though the technological changes support the increasing frequency of e-journals over their print counterparts, changes in attitude are much slower to appear.

Are E-Journals “Respectable”?

At the International Conference on Refereed Electronic Journals, held at the University of Manitoba in October, 1993, the lack of scholarly respect for e-journals was directly addressed. In part the conference was an attempt to make academic merit the sole consideration in the publication of journal-type research, and it sought to advance the idea that the academic community should have a hand in determining what gets published and how it is disseminated; and it resolved to provide an outlet for research publication that is not subject to the severe economic constraints of traditional paper-journal publishing. The conference further attempted to outline ways in which the advantages of electronic publication (savings in production costs, speed-up in publication and dissemination) might be highlighted in the minds of academics, hopefully resulting in universities’ taking on a greater role

NYU Libraries on the Web

NYU Libraries are now on the NYU Web, under the heading Facilities and Resources or at http://www.nyu.edu/library/
The Libraries' many publications are available here, from basic resources like the schedule of hours to the many subject-specific guides to research. Subject specialists are working on their own home pages, which will identify Internet resources of interest to the NYU community. In addition, the Libraries’ home page offers access to a number of exhibitions, including “Master of Mythologies: The Fictional World of Jerome Charyn,” and “Oscar Wilde: Reading Wilde, Querying Spaces.”
Where Do I Find E-Journals?

The range of e-journal subject areas is as broad as that of their printed equivalents. Ease of access, format, and quality also vary widely. There are several online directories that list available e-journals.

As mentioned in the article, the Scholarly Communications Project has about a dozen e-journals linked to its home page:

http://borg.lib.vt.edu/

Among these are the Chicago Journal of Theoretical Computer Science, a peer-reviewed scholarly journal published by MIT Press, and Modal Analysis, The International Journal of Analytical and Experimental Modal Analysis, published by the Society for Experimental Mechanics, Inc.

The Committee on Institutional Cooperation has a directory of about 50 journals, with links, at http://ejournals.cic.net

These are also primarily scholarly journals, such as Architronic: Electronic Journal of Architecture and Journal of World Anthropology.

The motherlode of online e-journals is probably the directory maintained by the Association of Research Libraries at http://arl.cni.org

This directory has hundreds of journals, ranging from peer-reviewed journals such as American Mathematical Society Bulletin and Teaching English as a Second or Foreign Language to Practical Anarchy Outline: The Practical Aspects of Anarchy. Although this directory does not have direct hypertext links to the various journals, addresses for subscribing are provided.

themselves as disseminators of research information, and not just as producers and consumers. These points underscore the concern with which elements of the academic community view the inferior status conferred on e-journals and recognize that the only practical future for the scholarly journal may be in electronic form.

Mark Bothwell, in an editorial appearing in the e-journal Neurotrophism (February 1995), points out two significant obstacles to electronic publishing in the scientific research community: “First, not all scientists have access to the World-Wide Web, and consequently, articles published on the Web will not be seen by all scientists. This situation is rapidly changing as the number of Web users grows exponen-

tially. Second, career advancement in research science is determined, to a substantial degree, by publication record, and publication record is understood to mean print publication in refereed journals. At the moment, university tenure committees will undoubtedly discount publication in electronic journals.” Bothwell predicts that within the next five years these attitudes will change, that electronic journals will become widespread, and that papers published in e-journals will be deemed equal to those published in print publications.

One additional issue is that the majority of e-journals are not included in the standard scholarly indexes, and therefore are virtually unavailable to the scholarly researcher; electronic journals are consequently perceived as lacking permanence. While this is changing, this real or perceived lack of permanence also contributes to the second-class status of the electronic journal within the academic world, which in turn reinforces the ambivalence with which most index publishers view the electronic journal.

Publish (in Print) or Perish?

The maxim “Publish or perish” is taken seriously by academics seeking tenure, and the issue of tenure looms large in any discussion of the legitimacy of electronic journals. Although in some disciplines it seems to be accepted that being published is being published, regardless of the medium, in most fields

(continued on page 35)
Books on Linux, Software on Windows 95, & Gigabytes on Disk at Computer Store

Brian Kress, Jaya Punjabi, Diane Osborn
computer.store@nyu.edu

As we look ahead toward the new semester, a few items stand out from the crowd of new and updated merchandise.

Hardware at the Computer Store

IBM has just come out with newer and faster versions of the PC 300 and PC 700 series computer. All models are Pentiums, running at either 90Mhz, 100Mhz, or 133Mhz. Systems with hard drives holding either 540 megabytes or 850 megabytes are already available. Early in 1996, 1 gigabyte hard drives in many system configurations will be available.

New to the ThinkPad Family is the ThinkPad 365. This new system is packed with the power and performance you expect with room to grow and meet future needs. The ThinkPad 365 has a Cyrix DX4 75 MHz processor and comes with an active matrix or dual scan display. Hard drives range from 340 to 540 MB and some configurations have dual speed CD ROMs.

IBM has such a variety of computers and options available that we are unable to include all of them in our printed price lists. If there is a particular configuration that you have seen advertised and it does not appear on our price lists, please ask our hardware buyer to get information on pricing and availability for you.

Hewlett-Packard Printers, for both IBM and Macintosh, are available at the NYU Computer Store. If you are interested in purchasing a printer for an older computer, you will need to gather some information before you come in. If you have a Macintosh computer, you need to know the model you have and the version number of the system software you are running. If you have a PC, you need to know the make, model, version of DOS, and version of Windows. This information available will help us to make sure you purchase a printer that will work with your system.

Compaq and Aptiva computers are great value for the home and office user. These models are designed for those who want to be able to do something — right out of the box. They come standard with a quad-speed CD, a modem, and a ton of software. For kids there are some games and drawing programs; the adults can entertain themselves with Netscape, America Online, and Rand McNally Tripmaster.

From the Software Department

What's new in software at NYU? Come to the NYU Computer Store and have a look; we have the new versions of many of your favorites. PageMaker 6.0 is here for Mac and Power Mac and for Windows 95, adding 50 new enhancements to the program. This is the first major upgrade to the program since the recent merger between Aldus and Adobe. PageMaker 6.0 offers a range of new features emphasizing versatile color publishing, flexible page design, expert printing and pre-press controls, extendability via plug-ins, and enhanced compatibility and integration with other Adobe products. In addition, PageMaker 6.0 features new technology for creating publications in Adobe’s Portable Document Format.
A corner of the NYU Computer Store's book department.

(PDF) and authoring HyperText Markup Language Documents (HTML) for electronic publishing on the World-Wide Web.

Also new from Adobe is PageMill, a Web page authoring software specifically designed to address the needs of non-technical people who want to create or maintain content on the Web. PageMill is fast and easy to use, and it includes, in one well integrated package, everything you need to create Web Pages. You write in what feels like a word processor, while the program configures what you’re writing for the Web. Some of its features are applying styles, placing and resizing images, and drag-and-drop editing.

New for multimedia and music programming is MAX 3.0 from Opcode. MAX’s object-oriented language lets you create custom applications quickly and easily. MAX does not sacrifice power or precision in order to achieve ease of use. Its real-time environment lets you run multiple events simultaneously, and see the results of programming changes immediately. Accurate timing services make both internal and external events take place exactly when you want them to. There are 150 objects on-board, each with its own extensive help window. The system also includes Trace, which allows you to locate bugs visually for faster, easier debugging, and MAXplay, a run-time version of MAX that bundles easily with your application.

Other new items in stock include Adobe Acrobat Pro 2.1 for Mac and Windows, WordPerfect 3.5 for Mac, Quicken 5.0 for Windows95, and Quicken 6.0 for Mac (both standard and deluxe versions), and Visual Basic from Borland. Microsoft is releasing Visual Basic 4.0 Pro and Visual C++ 4.0 at the end of December, and by January, Windows 95 applications will be available from Lotus, Novell, and SPSS. So stop by the NYU Computer store — you never know what might be new.

And from Our Book Department...

The most recent category to turn up in the computer-book department is Linux. Linux is a complete PC-based version of Unix that is distributed freely or for very little charge. Since there is, at this point, no official retail copy packaged with a license and documentation, books are in high demand. Here are some titles that can help you around Linux (especially helpful if you don’t know Unix).

- Running Linux by Matt Welsh and Lar Kaufman. $24.95 from O’Reilly and Associates.
- The Complete Linux Kit by Stefan Strobel and Thomas Uhl. $59.95 from Springer-Verlag (includes 2 CDs).
- Linux Unleashed by Kamran Husain, Timothy Parker, et al. $49.99 from Macmillian Computer Publishing (includes 1 CD).
- The Linux Bible 3E from Yggdrasil Computing, $39.95 (includes 1 CD).
- Plug and Play Linux, Fall 1995 Edition from Yggdrasil Computing, $39.95 (includes 2 CDc).
- Linux Developer’s Resource CD-ROM, $14.75 from Info-Magic (4-CD set).

Also, look for many, many titles coming out on Java and CGI in the new year.

NetBill (continued from page 30)

Bill protocols and libraries.) If you accept the quote, the vendor sends the article to you, in encrypted form, and sends the bill to the NetBill server, where the credit is transferred from your account to the vendor’s (the only time the server is involved), and the key to decrypt the article is sent to you. Both you and the vendor will maintain accounts with the NetBill server. It will debit you for your small purchases until it needs to replenish your account with another $50 or $100, through your bank, credit card, or whatever other means you’ve agreed on. Similarly, it will accumulate credits until the sum is large enough to send to the vendor’s bank.

That, of course, is only a sketch of the plan. You can find out more about NetBill on the Web at http://www.ini.cmu.edu/NETBILL/

— David Frederickson
Coming Events

Meetings of Interest

Computers and the Quality of Life
February 14–15, Philadelphia, Pennsylvania; Contact C. Dianne Martin at diannem@seas.gwu.edu or (202)-994-8238.

The Sixth Conference on Computers, Freedom, and Privacy
March 27–30, MIT, Cambridge, Massachusetts; Contact CFP at cfp96@mit.edu or (617)-253-6014.

March 11-13, Tempe, Arizona; Contact Barbara Ford at MECCONF@asuvm.inre.asu.edu or (602)-965-7363.

Digital Libraries '96: 1st ACM International Conference on Research and Development in Digital Libraries
March 20–23, Bethesda, Maryland; Contact Gary Marchionini at march@oriole.umd.edu or (301)-405-2053.

7th National Conference on College Teaching and Learning
March 20–23, Jacksonville, Florida; Contact Jack Chambers at jchamber@fccj.bitnet or (904)-632-3231.

National Educational Computing Conference
June 11–13, Minneapolis, Minnesota; Contact TIES at necc96@ties.k12.mn.us or (612)-638-8769.

AAAI '96: Thirteenth National Conference on Artificial Intelligence
August 4–8, Portland, Oregon; Contact AAAI-96 at ncai@aaai.org or URL http://www.aaai.org or (415)-328-3123.

Conversely, one study published in early 1995 supports the view that there is no scholarly disadvantage to e-journal publication. In her recent survey of 186 authors and editors at 10 electronic-only journals, Julene Butler of Rutgers University found that “it does seem safe to conclude . . . that . . . electronic publication has not led to a failure to receive rewards. Furthermore, although there is a strong perception that colleagues see e-publication as less significant than print publication, very few contributors have actually been challenged regarding their e-publication or asked to justify it through formal review channels.”

Researchers in the United Kingdom, on the other hand, have a formal policy regarding the validity of the e-journal in the tenure process: “In the light of the recommendations of the Joint Funding Councils’ Libraries Review Group Report (published in December 1993) refereed journal articles published through electronic means will be treated on the same basis as those appearing in printed journals.” The existence of such a policy statement does indicate, however, that discrimination against e-journals does, or did, exist.

Here to Stay?

Statistics indicate that electronic journals are here to stay; the number of electronic journals has seen remarkable growth in the last few years, with over 6,000 as of mid-1995. These include print journals that have added an electronic version, some which have replaced their print versions completely with an electronic one, and the many new titles that have no print forerunners. Here to stay? Probably. But, whether “here” means Academia or the vast Universe of the Internet remains to be seen.

References
The Research Assessment Exercise and Electronic Journals HEFCE Circular RAE96 1/94 para 25c
ACF Classes, Workshops, and Talks

General Information
All members of the NYU community are welcome at the ACF's classes, workshops, and talks. There is no charge for any of the ACF Instructional sessions, but participants should have a current, valid NYU ID. In some cases, as noted just after a course description, a reservation or an appropriate computer account is required.

Reservations: To reserve a place when required, please call the ACF HelpLine at 998-3333 during the week of the workshop or class.

Seating capacity: To avoid overcrowding, we have determined maximum seating capacities for each of our classrooms. This information is provided in instances where reservations are not required. We recommend that you arrive a few minutes early in order to secure a spot.

Classes by arrangement: Faculty members may sometimes 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 HelpLine (998-3333).

Computer accounts: There are several kinds of ACF accounts, which give the holder access to different types of machines and services. For further information, see the boxes on page 44.

— Vincent Doogan
doogan@nyu.edu

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36 Spring 1996 Connect: Academic Computing and Networking at NYU
Q: I'm having trouble logging in to my account. When the computer prompts me for my username, I enter johndoe@is3.nyu.edu — but it says the name is invalid. What's wrong?

A: You're entering your full Internet address. Your username is only part of your Internet address — everything to the left of the @ sign. Your login username is johndoe. (Other NYU usernames are a combination of letters and numbers, such as xyz1234.) Be sure to enter your username using only lowercase letters, since the operating system is "case-sensitive" — it differentiates between capital and small letters.

— L. Barnett

Call the ACF HelpLine at 998-3333
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. Taught by staff from the NYU Computer Store. Seating capacity: 30; first come, first served; talk.

Warren Weaver Hall, room 313
Fridays 12:00–1:30
February 2

Troubleshooting and Maintaining Your Mac (Mac)
Discussion will include troubleshooting techniques and other strategies for dealing with problems that you might encounter while using your Macintosh. Taught by staff from the NYU Computer Store. Seating capacity: 30; first come, first served; talk.

Warren Weaver Hall, room 313
Friday 12:00–1:30
February 16

Troubleshooting and Maintaining Your PC (PC)
Discussion will include troubleshooting techniques and other strategies for dealing with problems you might encounter while using your PC. Taught by staff from the NYU Computer Store. Seating capacity: 30; first come, first served; talk.

Warren Weaver Hall, room 313
Friday 12:00–1:30
February 23

Using a Mac at an ACF Lab (Mac)
A hands-on introduction to the Macintosh computer. Topics include 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: 25; first come, first served; hands-on class.

Tuesdays 11:00–12:00
January 30
February 6

Saturdays 11:00–12:00
February 3, 10

Using a PC at an ACF Lab (PC)
A hands-on introduction to the PC — the “IBM-type” personal computer. Topics include working with the user menus on the PCs in the labs, understanding the file system, choosing printers and file servers, and launching software applications. ACF staff.

Tisch Hall, room LC8
Seating capacity: 25; first come, first served; hands-on class.

Saturdays 11:00–12:00
February 3, 10
14 Washington Place, basement
Seating capacity: 15; first come, first 
served; hands-on class.

Thursdays 11:00-12:00
February 1, 8

3rd Avenue No. Res. Hall, level C-3
Seating capacity: 15; first come, first 
served; hands-on class.

Mondays 1:00-2:00
January 29
February 5
Wednesdays 11:00-12:00
January 31
February 7

Using Unix at the ACF
(Ulrix machines)
An introductory class on using the Unix operating system, variants of which run on several different classes of computer at the 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. See also Using Unix: Special Topics, under “Computers and Operating Systems”. ACF staff.
ACF Unix account required.

Tisch Hall, room LC8
Seating capacity: 25; first come, first 
served; hands-on class.

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

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

Fridays 1:00-2:00
February 2, 9

Using Unix: Special Topics
(Ulrix)
An intermediate talk on using the Unix operating system for those who have attended Using Unix at the ACF (see under “ABCs of Computers”) or have equivalent knowledge. Topics include file permissions, path, aliases, pipes, redirect, filename completion, command substitution and a number of commonly used Unix utilities such as man, vi, and grep. Ed Nichols. Seating capacity: 30; first come, first served; talk.

Warren Weaver Hall, room 313
Wednesday 12:00-1:30
February 21

Introduction to the Internet and Your ACF E-Mail Account
(Ulrix)
This talk-demonstration will introduce new and prospective holders of the NYU-Internet Account to its menu interface and components. Electronic mail concepts and commands will be explained and demonstrated. The account runs on ACF’s DEC minicomputers and is connected to NYU-NET and the worldwide Internet.
Lisa Barnett and Vincent Doogan.

Warren Weaver Hall, room 101
Seating capacity: 75; first come, first 
served.

Fridays 12:00-1:30
February 2, 9, 23

Unix by E-Mail
Computer Advocacy at NYU — a group registered with the Office of Student Activities — is offering a course on Unix for anyone with an e-mail account at NYU. The course will cover a broad range of topics, starting with the basic commands (such as the ones used to move around the file structure), and going into intermediate topics (permissions, etc.). Also covered are basic Unix-based Internet utilities (Telnet, Finger, etc.), as well as an introduction to the information systems available on the Internet (newsgroups, World-Wide Web, etc.).

The lessons will be mailed to the participants two times a week, starting February 5. The course is open to all members of NYU community. For more information, see the WWW page http://www.nyu.edu/pages/advocacy/committee/unix/ or send mail to Ilya Slavin at slavin@acf2.nyu.edu .

Connect: Academic Computing and Networking at NYU Spring 1996 39
NYU-NET Software
(Mac, Windows)
This talk is intended for those who have TCP/IP connections to NYU-NET from their office or home. The TCP/IP and PPP protocols will be discussed, and software based on these protocols will be demonstrated. The software to be discussed include: Eudora, Fetch, Turbo Gopher, Mosaic and Netscape. ACF staff.
Seating capacity: 30; first come, first served; talk.

Warren Weaver Hall, room 313
Wednesdays 12:00-1:30
February 7
March 6

News Groups and Gopher
(Ultrix)
A presentation of two Internet Services. News groups are special-interest discussion forums on the Internet, and Gopher is an information retrieval protocol in a menu format. Using the NYU-Internet Account, the speaker will introduce basic concepts and demonstrate the command sets of Gopher and Tin, a newsreader utility. ACF staff.
Seating capacity: 30; first come, first served; talk.

Warren Weaver Hall, room 313
Wednesday 12:00-1:30
February 14

Uploading & Downloading Using Kermit
A useful class for those who want to do their wordprocessing and other work on their desktop PCs or Macs, and then send the files by E-mail or upload them to VMS or Unix machines, or need to download files from distant machines to their own computers. Telnet, FTP, and Archie will be discussed. Johnny Chung.
Seating capacity: 30; first come, first served.

1. For PC Users
Warren Weaver Hall, room 313
Wednesday 2:00-3:30
February 14

2. For Macintosh Users
Warren Weaver Hall, room 313
Wednesday 2:00-3:30
February 28

World-Wide Web Browsing and Publishing
The World-Wide Web is a Hypertext interface system for publishing documents containing text, sounds and images. These documents are browsed with software such as Netscape and Lynx. Hypertext Markup Language (HTML) is the mechanism for preparing homepages and other Web creations. ACF staff.
Seating capacity: 75; first come, first served; talk.

1. Introduction to the World-Wide Web
(Mac, Unix, Windows)
Lynx and Netscape are programs that allow you to browse World-Wide Web servers — repositories of digital images, sounds, and text. The evolution of these easy-to-use browsing tools has made it possible for even

For More Information:
Call the ACF Help Line, 998-3333.
Introduction to GIS
Packages Available at the ACF
(Unix)
A discussion describing and comparing the four Geographical Information Systems packages available at the ACF. These are ArcInfo, MapInfo, Atlas GIS, and GRASS.
Frank LoPresti.
Seating capacity: 30; first come, first served; talk.

Warren Weaver Hall, room 313
Tuesday 2:00–3:30
March 19

High-Performance Supercomputer Resources
(IBM RISC cluster; SGI Challengers; NSF supercomputers)
An introduction to supercomputer resources available to NYU faculty and students—both local resources and those accessible via the Internet. Local resources include a cluster of high-performance RISC-based RS/6000 workstations that has recently been acquired as part of a new Center for Applied Parallel Computing that the ACF, in collaboration with the IBM Corporation, has set-up at NYU. The discussion will cover the RISC farm’s intended uses and software, as well as the availability of additional resources for computationally intense applications. The speaker will then focus on the use, from NYU, of high-performance systems at the National Science Foundation supercomputing centers. NYU researchers and students have been given access via the Internet to these centers as well as to supercomputing centers operated by NASA and DOE. (A kit available from the ACF in room 305, Warren Weaver Hall, describes how to apply to some of the NSF centers.)

Edward Friedman.
Seating capacity: 30; first come, first served; talk.

Warren Weaver Hall, room 313
Tuesday 2:00–3:30
February 6

Scientific Visualization Resources at the ACF
(Siicon Graphics)
The need to understand abstract and sometimes very large data sets generated from scientific studies is making scientific visualization more and more important. After a short introduction to the field, the lecturer will present an overview and hands-on multimedia demonstration of the various resources—software and equipment—available to scientists on the Silicon Graphics (SGI) computers at the ACF.

Topics discussed will include software packages for visualizing fluid dynamics, molecular models, volumes, and abstract mathematics; modular software packages; libraries for 2D and 3D graphics; image processing, movie, and audio; slide presentations; visual debugging and analysis of computer programs; online hypertext documentation; and conversion between image formats including PostScript and MPEG.

Additionally, the ACF’s stereographics equipment will be demonstrated in relation to both scientific visualization packages and solutions for the computer programmer.

ACF Staff.
Seating capacity: 30; first come, first served; talk.

Warren Weaver Hall, room 313
Tuesday 2:00–3:30
February 13

Scientific Computing and Visualization

Warren Weaver Hall, room 313
Tuesday 2:00–3:30
February 13

Exploring for Scientific Resources on the Internet
(X-Terminals, SGI Irix)
A discussion and practicum on how to gain access to available national and international science resources on the Internet, and a demonstration of how to locate and retrieve infor-
Hands-on use of large-screen color X-terminals in the ACF Innovation Center, using the latest software, will provide a state-of-the-art multimedia interface to the resources.

Some of the servers that will be visited include the National Science Foundation's Supercomputing Centers; Netlib, a repository of mathematical and statistical software and publications; and the Computational Science Education Project (CSEP). A visit to servers on SUNET, the Swedish University Network, will include stops at the Karolinska Medical Institute and the Royal Institute of Technology. Edward Friedman. 

Seating capacity: 30; first come, first served; talk.

Warren Weaver Hall, room 313
Tuesday 2:00-3:30
February 20

A Viewing of Scientific Visualization Videos
A presentation of videos created at the ACF Scientific Visualization Lab, as well as a selection of videos previously presented at various conferences, such as ACM’s IEEE’s Visualization and SIGGRAPH and the Computational Geometry Conference. Featured videos will include “The Visible Human” and “The Largest Structures in the Universe.” ACF Staff.

Seating capacity: 30; first come, first served; talk.

Warren Weaver Hall, room 313
Tuesday 2:00-3:30
March 5
Wordprocessing

Microsoft Word
(Mac)
Microsoft Word is a major word-processing program on Macintosh computers and is especially strong on typography and formatting.

1. Introduction to Microsoft Word
This is a getting-started class. The basics of creating a document will be covered. Howard Fink.
Reservations required (call 998-3333 during week of class); hands-on class.

Education Building, 2nd floor
Fridays 10:00–11:30
February 2
March 1

2. Advanced Topics in Microsoft Word
Topics will include mailmerge and tables. Knowledge of Microsoft Word and Macintosh basics required. Howard Fink.
Reservations required (call 998-3333 during week of class); hands-on class.

Education Building, 2nd floor
Fridays 10:00–11:30
February 16
March 8

WordPerfect
(PC)
WordPerfect is the most widely used PC wordprocessing program, with many formatting features.

1. Introduction to WordPerfect
The basics of creating a document in WordPerfect will be covered. Ed Nichols.
Reservations required (call 998-3333 during week of workshop); hands-on workshop.

Tisch Hall, room LC8
Fridays 10:00–11:30
February 9

2. Intermediate WordPerfect
More advanced topics in WordPerfect will be covered (footnotes, fonts, and search & replace). Knowledge of WordPerfect and PC basics required. Ed Nichols.
Reservations required (call 998-3333 during week of workshop); hands-on workshop.

Tisch Hall, room LC8
Fridays 10:00–11:30
February 23

SPSS Running on
the IBM RISC-based
RS/6000 at ACF
(AIX)
An introduction to SPSS running on a high-performance Unix resource available to NYU faculty and students. This is a Windows-like GUI (graphics users interface) version of SPSS new at the ACF. Data and output are displayed in windows rather than through traditional command line mode. Such an application running in a Unix X-windows workstation environment holds interest for academic researchers whose storage, speed, and support needs are beyond the capabilities of a personal computing system. Frank LoPresti.
Seating capacity: 30; first come, first served; talk.

Warren Weaver Hall, room 313
Mondays 6:00–7:30
February 5, 26
Thursdays 6:00–7:30
February 8, 29

For More Information:
Call the ACF Help Line, 998-3333.
Using the ACF's Computer Labs

NYU faculty, staff, and students in degree or diploma programs may use the PCs and Macintoshes in the ACF's computer labs for limited hours without charge as general users. There is no application procedure; simply come to a lab with your valid NYU ID.

Getting an ACF Priority or Class Account

For priority access to the labs at all times, and to use most other ACF computers and special equipment, you will need to have an ACF priority account. There are two kinds. Faculty, staff, and students working on faculty-sponsored projects can obtain individual accounts. Instructors can obtain class accounts that cover all the students in a course section. To apply for a priority account, please contact the ACF Accounts Office (room 305 Warren Weaver Hall, 998-3035). For hours and availability to general users and to holders of priority accounts, see page 45.

The ACF recommends that instructors obtain an ACF Class Account whenever a course requires students priority access to ACF computers, and the application procedure helps the ACF to ensure that the appropriate software and training sessions are available.

Getting an NYU-Internet Account ...

ACF's NYU-Internet accounts provide e-mail connectivity and network access from your desktop computer to information resources at NYU and around the world.

NYU-Internet accounts are available to all NYU faculty, research staff, and administrators, and to all students enrolled in degree or diploma programs. Simply apply at any ACF computer lab (see last page for locations and hours). And, if you are unfamiliar with e-mail and network use, ACF classes and pamphlets will help you get started.

Faculty and staff members, if they prefer, may request NYU-Internet accounts at the Academic Computing Facility Accounts Office, room 305, Warren Weaver Hall (251 Mercer Street). For more information, contact the ACF Accounts Office at 998-3035.

At the Labs

The ACF's four instructional computer labs have over 340 Apple and IBM-type computers. All are linked to NYU-NET, the campus data network, and are connected to Novell-based file servers and printers. Each lab has two or more laser printers. A large collection of software (over 100 packages) is available.

Education Building, 2nd floor (100 computers)
- 33 PowerMac 6100 computers, with CD-ROM drives, color monitors
- 21 Macintosh Quadra 700 computers, with 20 MB memory, 80-MB hard drives, 16-in color monitors
- 2 Macintosh Quadra 800 computers, with CD-ROM drives, color monitors
- 14 Macintosh systems in the New Media Center dedicated to special projects and classes in the arts
- 6 Macintosh IIfx computers, with CD-ROM drives, and color monitors

Third Avenue North Residence Hall, basement (109 computers)
- 25 IBM PS/2 model 70 computers, with VGA color monitors numeric co-processors, and joysticks
- 10 DEC 486 computers, with 8 MB of memory, 120 MB hard drives, color monitors
- 18 Gateway 486DX2 computers, with 16 MB memory, 330-MB hard drives, 15-in color monitors
- 36 Macintosh IIsi computers, with color monitors
- 16 Macintosh IIfi computers, with 17 MB of memory, color monitors

Tisch Hall, room LC-8 (74 computers)
- 1 IBM-type computer with Accent Text-to-Speech Synthesizer, Vocal-Eyes Screen Navigation Software, Zoom-Text Screen Magnification Software
- 47 IBM PS/2, 55SX, with VGA color monitors
- 24 Gateway 486DX2 computers, with CD-ROM drives, 5.25-in and 3.5-inch diskette drives, 340-MB hard drives, 15-in color monitors

14 Washington Place (62 computers)
- 30 Gateway Pentium 75s, with 16 MB memory, 696-MB drives, Viviton monitors, CD-ROM drives
- 23 DEC 486DX computers, with 8 MB memory, 120-MB hard drives, color monitors
- 7 Gateway 486 DX computers, with 8 MB of memory, Super-VGA color monitors
- 4 IBM PS/2 386 computers, model 70, with 6 MB memory, VGA color monitors
Important ACF Telephone Numbers
ACF HelpLine 998-3333
Account Information 998-3035
Computer Documentation 998-3036
Innovation Center 998-3044
Statistical Consultants 998-3434
14 Washington Place Lab 998-3457
Education Building Lab 998-3421
Third Avenue Lab 998-3500
Tisch Hall Lab 998-3409
Warren Weaver Hall (rooms) 998-3456

Dial-in Access to ACF Computers
To connect via modem to NYU-NET, NYU's campuswide network, set your modem to 8 data bits, 1 stop bit, full duplex, no parity, and dial one of these numbers.
Modem Speed (bps) Dial
300–2400 995-3600
9600 or 14,400 995-4343
DIAL accounts only 253-4698

For More Information:
Visit us on the World-Wide Web at http://www.nyu.edu/acf/ or call the ACF HelpLine at 998-3333.

Expanded Spring Hours at the ACF:

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<tr>
<td>14 Washington Place*</td>
<td>closed 8:30 am - 11:30 pm</td>
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<td>Tisch Hall*</td>
<td>noon - 1:30 am</td>
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<tr>
<td>Education Building*</td>
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<td>Third Ave. North</td>
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<tr>
<td>Innovation Center</td>
<td>closed 9:00 am - 10:00 pm</td>
<td>9:00 am - 10:00 pm</td>
<td>9:00 am - 10:00 pm</td>
<td>closed</td>
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<tr>
<td>Help Center</td>
<td>closed 9:00 am - 6:00 pm</td>
<td>9:00 am - 6:00 pm</td>
<td>9:00 am - 6:00 pm</td>
<td>closed</td>
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*These labs open to general users Monday through Friday from 8:30 am to noon and 8:00 pm to closing, and on weekends during all hours of operation; open to priority access account holders during all hours of operation.

Exceptions to regular hours: Holiday schedules and other special announcements will be posted via the NYU Web at http://www.nyu.edu/acf/nyu-events/ and our online news facilities. ACF offices at 251 Mercer Street are closed on University holidays.
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“Hello, World!” — the classic programmer’s message, as encoded by the cryptographic program PGP. See Freedom and Privacy on the Electronic Frontier, page 13