What's New on the NYU CWIS: Registrar and WAIS Make It Easy to Search Class Lists, 3

Visual Computer — Using Metaphor to Teach How Computers Really Work, 16

Teaching Surgery in Virtual Reality: Surgical Simulation Toolkit, 18

TSOA Classes Meld Digital Manipulation, Morphing, and Animation for Video Output, 24

Academic Computing and Networking at NYU

Volume 4, Number 4
March 1994
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.

Copies of Academic Computing and Networking at NYU are mailed to University faculty and staff and are also available from the ACF’s Information Services Office (Room 312, Warren Weaver Hall). Students holding ACF individual computer accounts are included automatically in the newsletter’s mailing list.

We welcome your comments and suggestions about the articles in this issue, and about articles for future issues of the newsletter. Contributions from sources within the University are invited for consideration by the editor; please call 998-3038 or send e-mail to frederickson@acfcluster.nyu.edu for more information. Articles are written by members of the ACF staff, unless otherwise indicated.

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

Below many of the bylines in the newsletter are electronic mail (e-mail) addresses. If you do not use e-mail but would like to, see the box on page 8 for information about opening an appropriate account.

This issue was prepared on Apple Macintosh Quadra and IICi computers, using Aldus PageMaker, Microsoft Word, Adobe Type Manager, and Adobe Photoshop. Fonts used in this issue are Palatino for the text and Gill Sans bold for headlines, along with Zapf Dingbats and Courier for special effects; the logo is set in Adobe Garamond bold italic.

Camera-ready copy of text and screen shots was produced using a 600-dpi QMS 1700 printer. Color tabloid-size prints from a Tektronix Phaser IIIxi were used for preparing the cover; for the cover, and for many of the pages, negatives were made from digital output on disk. Echo Graphics printed and bound the newsletter.

Editor
David Frederickson
frederickson@acfcluster.nyu.edu

Editorial Assistant
David White
whited@acfcluster.nyu.edu

Production Assistants
Stephen Thompson,
Molly Stauffer

Design
David Frederickson

Contributors
David Ackerman, Frances Bauer,
Allison Druin (Center for Digital
Multimedia), Edward Friedman,
Ogden Goelet (FAS),
Estelle Hochberg, Ajit Kambil (Stern
School of Business), Brian Kress
(Computer Store), Larry Landweber
(University of Wisconsin),
Lorie Loeb (TSOA), Frank LoPresti,
Larry Mingione, Martin Nachbar
(School of Medicine), Eric Nadler
(TSOA), Tim O’Connor,
Gloria Rohmann (Bobst Library),
George Sadovsky, Leo Villareal
(TSOA), Irene Zabarkes (AMC)
Thanks also to Lisa Barnett,
Gary Chapman, Lucinda Covert-Vail
(Bobst Library), Vincent Doogan,
Edi Franceschini, John Quinan,
Lu Ratunil, Gary Rosenblum.
Dealing with Success

George Sadowsky
George.Sadowsky@nyu.edu

My predecessor, Max Goldstein, used to say, “Failure I can handle; it’s success that I can’t deal with!”

Max would have sympathized with the situation that we at the ACF are faced with today, with respect to the use of electronic mail and access to other network services by the NYU community. Those of you who have been using the ACF cluster for your e-mail have noticed delays in delivery of mail as well as problems with response time when you are typing at your terminal or workstation. We all have had a difficult time obtaining the responsive service we enjoyed in the past. We at the ACF are grateful for the patience you have shown while we dealt with the situation.

Growing Demands
One of the major causes of these problems has been the substantial and sustained increase in demand and utilization of all ACF services, including use of the ACfcluster for mail and network services. When the earlier configuration of the cluster was put in place in 1989, there were about 1,000 nodes on NYU-NET, and about 1,000 e-mail users at NYU. In 1994 there are almost 5,000 registered network nodes, and probably close to 10,000 e-mail users. In 1989, an ACF microcomputer laboratory might be about half full during peak periods. In 1994, with more and faster machines, the labs operate at near capacity for much of each semester.

In 1989, the notion of “network service” was poorly defined, and there weren’t many services available. In 1994, the worldwide Internet consists of over 2,000,000 machines, and network services are announced almost daily in the New York Times, the Chronicle of Higher Education, and CNN. In 1989 there were very few online campus information systems; in 1994, the number of registered Internet-accessible Gophers (most of which support such systems) is in excess of 4,000. Currently, network traffic on the NSFNET national backbone has been increasing at a rate of 15 to 20 percent per month for the last several years. (In economics, that kind of increase is called runaway inflation — something like 700 percent per year.)

In 1989, the White House telephone system was controlled by a manual plug switchboard, and knowledge of the Internet in Washington was generally limited to the National Science Foundation and scientifically oriented agencies. In 1994, federal agencies are being actively pushed to make their published information available over the Internet, and the National Information Infrastructure is a subject of debate at the highest levels of government. The Federal Register is now available over the network (and on the NYU CWIS) at the same time as it is published on paper. The entire Fiscal 1995 federal budget was made available online over the Internet almost immediately after its release. You can send electronic mail to President Clinton at president@whitehouse.gov.

Commercial services are growing extraordinarily quickly on the network. According to Cyberspace Development Corp., in 1992 there were only a few newspapers and magazines operating online editions. In 1994 there are more than forty newspapers and numerous magazines with electronic editions, and others are taking a serious look at opportunities for going digital. As an example, in February of this year the Encyclopedia Britannica announced its plan to dis-
tribute its information over the Internet to colleges and universities. (For more about that, see page 7.)

In the academic world, we observe the same phenomenon. The Chronicle of Higher Education's Information Technology section carries reports every week of new services available through the Internet. A Courant Institute professor has just co-authored an electronic book, available over the Internet through the World-Wide Web server at Vanderbilt University. Kent State University maintains an on-line list of scholarly electronic discussion groups; the list now numbers well over 1,000. New examples of such network-based knowledge emerge every day.

The strain on computing and staff resources caused by this increase in demand for network services is by no means limited to NYU. In February 1994, the New York Times reported that America On-Line (AOL), one of the fastest-growing information service providers that also offers limited access to Internet services, made the decision to stop soliciting new business because it could not handle what it was getting. The Times reported that AOL had to double its staff of programmers to keep up with demand. The Electronic Mail and Micro Systems Newsletter reports that CompuServe added 300,000 electronic mailboxes last year, while AOL reported a growth rate of 142%, to a total of 531,000 subscribers; analysts predict that they will have a total of 1 million users by next fall.

All of this change has happened in only five years. If the increase in awareness and utilization of network services at NYU has kept pace with what we observe in the rest of the world — and we believe that it has — it's a wonder that the original ACFcluster and the initial NYU-NET design managed to survive at all!

**A Vision for Growth**

We at the ACF live daily in this sea of change. We believe that it represents a paradigm shift of fundamental importance for most forms of communication, and that the Internet, in conjunction with computing technology, is the current forcing factor for such change. Our long-term vision is one of creating and sustaining access to information online, anywhere, and at any time, for our NYU community. In order to realize this vision, we need to help our community understand and adapt these new forms of communication to its objectives of teaching, learning, and research. Our program of activities therefore includes, _inter alia_:

- Upgrading the existing network infrastructure, as fast as funds permit, to ensure adequate capacity for traffic within all parts of the university and with the outside world.
- Expanding the number of high-speed network connections within the university, to all schools, to student residence halls, and to off-campus locations using the public switched telephone system.
- Substantial strengthening of our Help Center to provide broad assistance to all computing and network users, accessible easily by telephone, e-mail, or personal visit.
- Providing campus information services through our CWIS (Campus-Wide Information System), and at the same time, providing access to the many similar Gopher-based services available around the world.
- Identifying and obtaining more advanced and more effective forms of network navigation, resource discovery, and resource utilization, and helping the NYU community to exploit them fully.

Recently, we made the first significant upgrade to the ACFcluster hardware in over four years, hoping to add sufficient capacity to handle near-term increases in demand. Unfortunately, a new series of vexing problems arose, resulting in part from an underestimate of the additional capacity required, and in part from initial third-party software releases for this new hardware that contained residual bugs. We have worked intensively to identify and correct bugs and performance weaknesses in the new configuration, and we believe that we are near the end of this process. And, by the time you read this, we hope to have augmented the cluster hardware capacity to provide sufficient throughput to efficiently handle our existing and near-term demand for network services.

We understand how important it is to all of us at NYU to have effective access to electronic mail and to network services both now and in the future. Please be assured that we are committed to providing the promptest possible access to and execution of these services. Thanks for your patience!

2 March 1994 Academic Computing and Networking at NYU
Registrar and WAIS Team Up for Searchable Course Lists on NYU CWIS

David Ackerman
ackerman@nyu.edu

The Office of the University Registrar has made two important class lists available on the NYU Campus-Wide Information System (CWIS) — the Summer 1994 Class Schedule and the Summer 1994 Closed and Cancelled Class list. The Registrar plans to maintain a full year's schedule of classes on the NYU CWIS, posting each semester's schedule well in advance, as it becomes available. And the lists are now much easier to use, since you can search these lists electronically using WAIS (see box on page 4).

To find the Registrar's section of the CWIS, from the main menu, go to Admissions, Financial Aid, and Registrar, then Office of the University Registrar, and from that menu, select Summer 1994 Schedule of Classes. There are two ways to search the course schedules: by individual school, or the entire course schedule. The Registrar recommends using the individual-school search for quicker answers.

So, for example, suppose you are a music student in School of Education, and you are interested in taking music classes during the summer. You probably already know that course numbers in your de-

---

What Is the NYU CWIS?
Developed and operated by the Academic Computing Facility, the NYU Campus-Wide Information System provides easy, menu-driven access to a growing online repository of current information about NYU facilities, programs, and events, and to a wealth of resources available via the worldwide Internet. Examples include electronic journals, research reports, and archives of scholarly materials, as well as hundreds of library catalogs around the world including those of NYU's Bobst Library, Law, Medical and Dental Schools.

Using the NYU CWIS Is Easy
You can connect to the CWIS from desktop computers in NYU offices and labs, or using a modem and ordinary telephone line from your home computer. If you have an ACF Electronic Mail and Information Services (EMIS) Account, select Info from the EMIS main menu; then, from the Info menu, select NYU CWIS. (For more about the EMIS accounts — which are available to NYU faculty, staff, and degree students — see the box on page 8.) Full-service accounts on the ACF's VMS and UNIX computers also provide access to the CWIS: type gopher at the system prompt.

When the NYU CWIS main menu appears, simply use the up- and down-arrow keys on your keyboard to choose the item that interests you, and press the Return key. Start by selecting the first item on this menu, for simple instructions on using the NYU CWIS and for information on CWIS highlights. Information can be read on-screen or e-mailed back to yourself for subsequent downloading and printing. When you're done, simply type u to return to the previous menu.

Further Information
For more information regarding the NYU CWIS see the articles in the three previous issues of this newsletter. If you are interested in becoming an information provider to the NYU CWIS, or if you have any questions, you may send e-mail to cwis@nyu.edu (or simply cwis from the ACFcluster) or call the Academic Computing Facility HelpLine at 998-3333.
WAIS: A Simple Tool for Searching Gopherspace

WAIS (pronounced "wayz") stands for Wide Area Information Servers, and is a networked information-retrieval system. Originally, the program was developed by Thinking Machines, Apple Computer, and Dow-Jones.

One of the uses of WAIS is as the search engine for Gopher, the program that runs the NYU CWIS.

WAIS and Gopher work together. WAIS uses indexes of information so that Gopher can search the section of the NYU Campus-Wide Information System that has the Summer 1994 Course Schedule, discussed in the accompanying article. WAIS uses a prepared index, which makes the search much faster.

The Registrar puts the files containing the Summer 1994 class listings on the CWIS, then runs a program called WAISindex to produce an index of every significant word and number in the listings; a separate index is made for each school, plus one master index for all the schools. The index for each school’s listings sits on the server with the listings themselves. When a request for a search is made, Gopher “knows” how to look at the relevant index and get the result.

Even if the details seem complex, searching with WAIS is simple. Try it out for yourself! For more information about WAIS, there is a chapter devoted to it in The Whole Internet: User’s Guide and Catalog by Ed Krol, available at the NYU Computer Store (see page 14).

The first image shows the Summer 1994 menu. After selecting Search School of Education, the search-request line opens, as shown below, and you type the word or string of
Administrative Management Council Puts Online Bulletin Board on NYU CWIS

With the help of New York University's Academic Computing Facility, the AMC has launched an electronic community bulletin board to help NYU employees exchange goods and services. It is meant to be a listing of noncommercial "classified ads," not a data or information exchange, and we hope that you will use it to post listings of goods and services that you are seeking or would like to sell or give away.

For example, if you need a math tutor for your child, if you have a table you want to sell or give away, or if you collect rare stamps, you can use the electronic bulletin board to advertise.

On the CWIS main menu, select

The Federal Register Is Available Online through the ACF

The Academic Computing Facility has obtained a one-year, multi-user subscription to the U.S. Federal Register via Internet, which runs thru the fall. If you are interested in accessing the latest federal announcements and regulations online, send e-mail to cwis@nyu.edu or call the ACF Help Line (998-3333).

For more information, see the story in the May 1993 issue of this newsletter.

It is probably better to limit your search to one word on the request line. Putting in more than one word results in matches to any of the words, and possibly too many matches.

Perhaps best of all, when students want to find out what courses are offered, or even if they just need to look up the Call Numbers of the courses they want to take, they can now do this without picking up and discarding yet another copy of the Class Schedule booklet. Is it possible that the heretofore unrealized promise that computers once held out - of saving some trees - may yet be realized?

characters that you would like to search for, in this case E85. Below, the list resulting from the search, and right, the text of the listing for the course selected.

The Federal Register is Available Online through the ACF

The Academic Computing Facility has obtained a one-year, multi-user subscription to the U.S. Federal Register via Internet, which runs thru the fall. If you are interested in accessing the latest federal announcements and regulations online, send e-mail to cwis@nyu.edu or call the ACF Help Line (998-3333). For more information, see the story in the May 1993 issue of this newsletter.

New York University: General Information

Administrative Management Council Bulletin Board

On the next menu, select and read About this Bulletin Board

This and the other menu items will guide you through posting and reading ads.

If you have any questions or comments, please call me at 998-2333. We hope that you will find this service useful and that it will help to bring all of us a little closer together. - Irene Zabarkes

zabarkes@acf2.nyu.edu

(Irene Zabarkes is the Chairperson of the AMC)

The Federal Register Is Available Online through the ACF

The Academic Computing Facility has obtained a one-year, multi-user subscription to the U.S. Federal Register via Internet, which runs thru the fall. If you are interested in accessing the latest federal announcements and regulations online, send e-mail to cwis@nyu.edu or call the ACF Help Line (998-3333). For more information, see the story in the May 1993 issue of this newsletter.

characters that you would like to search for, in this case E85. Below, the list resulting from the search, and right, the text of the listing for the course selected.
Above: If you've ever wondered just how far the Internet extends, Lawrence H. Landweber is the man to ask. He's a professor of computer science at the University of Wisconsin; twice a year he updates this map to show which countries are connected to the Internet and which have less advanced digital connections, or none at all.

**ACF HelpLine Q&A**

**Q: What's the difference between the Internet and Ethernet?**

**A:** Somewhat like the difference between a baseball league and a bat. The Internet is a huge computer network, and Ethernet is a codified system of linking computers to form a network.

The Internet is a massive worldwide collection of computer networks. Once you connect to part of the Internet, such as NYU-NET, you can connect to millions of other computers around the world. The data super-highway that we hear so much about would help to make these connections faster and more powerful.

Ethernet, on the other hand, is not a network, but a system for connecting computers so that they can communicate with each other. This involves a network protocol — that is, a set of rules and conventions for connecting computers to form a high-speed network — and the hardware that makes it possible. To have an Ethernet connection between your computer and NYU-NET, you need to have the right hardware in your computer (either as part of the original equipment, or as an add-in card) and you need to be in a building that has special network wiring for Ethernet connectivity.

Many of the buildings on the NYU campus have such wiring. (If your building doesn't have Ethernet wiring, you can still connect to NYU-NET through serial connections, which follow a different set of standards for communication between computers.) More NYU buildings, including dorms, add Ethernet capability every year.

**Call the ACF HelpLine at 998-3333**
University Presses in the Networked Information Environment

The Association of American University Presses (AAUP) and the Coalition for Networked Information (CNI) have selected thirteen institutions to participate in a new joint program. This initiative is intended to help university presses in their efforts to develop networked information resources and services, to improve the infrastructure for these resources and services, and to experiment with mechanisms for production, distribution, and utilization of scholarly and scientific materials in networks.

The projects span a wide range of scientific and scholarly subjects and publishing formats. For example, the University Press of Colorado will focus on eight journals and thirty monographs from nine colleges and universities; Columbia University will focus on its Concise Columbia Encyclopedia and Granger's Index to Poetry; and the University of Tennessee will focus on its Southern History Sampler, an electronic collection of excerpts from at least ten of its published titles in southern history.

The AAUP-CNI initiative will provide a vehicle for sharing expertise among these projects, for disseminating results from them, and for framing and addressing their common problems and opportunities.

Commenting on this joint initiative, Peter Grenquist, AAUP executive director, said, "Through these models, university presses will establish themselves at the forefront of efforts to publish the results of scholarship via the new technologies."

The initiative and the institutions and projects involved will provide topics for presentations and discussions at several major meetings this year: the Spring 1994 Coalition Task Force Meeting, the National NET 1994 conference, the EDUCOM 1994 conference, the Fall 1994 Coalition Task Force Meeting, and the CAUSE 1994 conference.

The AAUP, formally established in 1937, is a cooperative nonprofit organization of university presses and other scholarly publishers. The CNI was founded in March 1990 by the Association of Research Libraries, CAUSE, and EDUCOM to promote the creation and use of networked information resources and services that advance scholarship and intellectual productivity.

For further information, contact Peter Grenquist at (212) 941-6610 or aaupct@world.std.com or Paul Evan Peters, executive director of CNI, at paul@cni.org or (202) 296-5098.

--- from a CNI posting ---

The Encyclopedia Britannica Makes Plans to Go Online via Internet and Mosaic

Recently the New York Times reported that the august Encyclopedia Britannica was announcing plans to go online over the Internet. Users at universities and some public libraries will be able to read its 44 million words and view its 2,000 illustrations using Mosaic, the software designed for multimedia networking (see articles in the November and January issues of this newsletter).

It will not be the first electronic encyclopedia, but it will apparently be the first to publish itself over the Internet. Other encyclopedias have licensed their content to such online services as Prodigy and CompuServe, which provide the material to their subscribers. The Britannica sees more control, and income, in doing the publishing itself, though details of both pricing and procedure were still being worked out.

NCSA Mosaic is potentially an excellent tool for viewing an electronic encyclopedia. The program, being developed by the National Center for Supercomputing Applications, can retrieve both text and pictures from the computer on which they’re stored and display them on the monitor connected to the user’s computer. More to the point, it is designed to facilitate hypertext links. These are the electronic equivalent of an encyclopedia’s cross-references and QV’s: invisible codings buried in the text, which show up onscreen as words highlighted in various ways. When the user clicks on these words, the program calls up a related article, definition, reference, or illustration. The various component levels of the Britannica — macroedia, micropedia, propedia, and index — will similarly be linked.

Preparing the links for such a mass of information is, understandably, no light task. Testing of the Britannica Online and its searching software (being developed by WAIS, Inc.) has begun at the University of California; this fall, the testing program will become larger, and may possibly include NYU.

The White House and the Internet, Installment 3

The White House continues its march into the electronic age. In previous issues (March and September 1993) we’ve mentioned ways to send e-mail messages to the president and told how to retrieve various documents — press briefings, position papers, background reports, transcripts of press conferences. Things have changed, and some of the earlier directions and addresses are no longer valid. Here’s an update.

If you want to send an e-mail message to the president, the address — president@whitehouse.gov — is still the same. You should get an
ACF HelpLine Q&A

Q: I want to use electronic mail and explore the Internet. What do I need?
A: You need two things: some sort of computer connection to the Internet and an account that lets you use the connection.

There are many companies that sell access to the Internet for as little as $20 a month. However, if you are a student in an NYU degree or diploma program or are a member of the NYU faculty, staff, or administration, you qualify for a free account with the Academic Computing Facility. The ACF’s EMIS (Electronic Mail and Information Services) account gives you an address for sending and receiving e-mail and gives you access to Internet resources. (For more about the EMIS account, see the box below.)

As for connections, there are, broadly, two types: Ethernet and serial.

The fastest and most direct is an Ethernet connection (most likely through the internet). You'll get complete instructions. If you'd like information, in the form of transcripts, reports, and the like, there are at least three ways to find and retrieve it: by e-mail, by anonymous FTP, and via the NYU CWIS and Gopher.

By e-mail, if you send a message to publications@whitehouse.gov with help in the body (not the subject line), you'll get complete instructions. Or indicate the topic you're interested in like this: topic nafta. You'll receive a listing of all the relevant documents by name, along with the ordering number and the length of each. You can then order the ones you want. If you're a glutton, you can order the index of all the available documents; it comes to some 400 kilobytes, which would translate to about 200 pages.

Anonymous FTP is the traditional method for retrieving files from distant computers over Internet (for more about it, see the box on page 11). In this case, you connect via Telnet to whitehouse.gov and log in as user anonymous, giving your e-mail address as password. Type dir pub to get a directory of the available publications.

Perhaps the easiest way to browse much of the same material is on one of the Gopher servers that store the documents and make them available. There are several scattered around the country; the easiest one to find is listed on the NYU CWIS. From the main menu, select Using External Campus-Wide Information Systems, then Selected Gophers, New or Noteworthy, then White House Information. Browse the resulting menus until you find the document you want.

Obtaining an ACF EMIS Account

The ACF’s Electronic Mail and Information Services (EMIS) Accounts provide e-mail connectivity and network access — through the NYU CWIS — from your desktop computer to information resources at NYU and around the world. (E-mail is also available automatically to those with accounts on ACF shared systems.)

EMIS 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 inside back cover 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 EMIS Accounts by letter. Please use departmental letterhead with the department’s address and phone number, and include your name, title, and campus address and campus phone number. Please send your request to the Academic Computing Facility Accounts Office, Room 305, Warren Weaver Hall. For more information, contact the ACF Accounts Office at 998-3035.

Call the ACF HelpLine at 998-3333
The Oxford English Dictionary on CD-ROM

Gloria Rohmann
rohmang@acfcluster.nyu.edu

One of the world’s greatest reference books, the Oxford English Dictionary, is now available at the Electronic Text Center of Bobst Library. The first edition was begun in 1884, and it was more than forty years before its tenth and final volume was issued. The CD-ROM version, which is fully searchable electronically, contains all the entries in the twenty-volume 1989 edition plus over five thousand new entries.

More than just a comprehensive dictionary of English, the OED is also a history of the language, with thousands of chronologically arranged quotations showing the change in usage of over 290,000 English words that have been in use at any time between 1190 and the present. Because the quotations are taken from every era of English-speaking history, the OED is also an invaluable source of social history.

The OED on CD-ROM runs on the MS-Windows operating system, which provides a simple graphic interface to its many powerful search capabilities. Results of searches can be saved to a text file on a disk, and the user can highlight items of interest within records and cross-reference them to other parts of the dictionary. The OED on CD-ROM will be of interest not only to students and researchers of languages and linguistics, but to historians, philosophers and social scientists, or anyone interested in the changes in the ways English-speaking people have perceived and described their world.

A couple of examples will illustrate how this powerful reference tool might be used in the social sciences:

You can search for source languages to trace the influence of various groups on the English language, and on the English speaking world generally. For instance, from the Abnaki language — spoken by Native Americans in northern New England and the Maritime Provinces — come the words Eskimo, moose, toboggan, and tomahawk. It’s probably no accident that

Hands-On Internet Training

Now that you have your Electronic Mail and Information Services Account from ACF and are reading articles daily about the information superhighway and the “Net” — Do you wonder what is really out there? Are you ready to explore but not really sure where to begin?

Join your colleagues in the hands-on Internet sessions offered by Bobst Library for beginning Internet surfers. The sessions include a basic informational discussion of the Internet followed by guided hands-on experience with Gophers, Internet applications like Veronica, and library catalogs, databases, and listservs.

Training sessions are held in the Electronic Resources Center, B Level, Bobst Library. Advance registration is required. Contact Lucinda Covert-Vail at 998-2497 or covertvl@acfcluster.nyu.edu for questions or registration for any of the following:

March 29 10am to noon
April 13 6 to 8pm
April 21 10am to noon
May 17 10am to noon
International Computing in the Humanities: Problems and Promises

Ogden Goelet
goel@acfluster.nyu.edu

In my last article for this newsletter (November 1993), I tried to show how a recent conference of Egyptologists in Geneva reflected the far-reaching impact of the microcomputer on the way scholars in the humanities work today. For one thing, many scholarly projects today have become cooperative efforts that require constant communication and interchange of data. The discussions after the talks at the conference were not the usual stern critiques of methodology one normally hears at conferences, but instead, friendly exchanges of tips and techniques, some of which I hope to present in this article.

International E-mail: Which Alphabet?
As in most academic disciplines, we Egyptologists not only speak several different languages, but are also split almost evenly between users of Macintosh and IBM-type PCs. Fortunately, software manufacturers today increasingly incorporate “bridges” that allow their program files to be shared by both Mac and PC users.

It should come as no surprise, then, that there was much discussion at the conference about creating standards so that we might exchange data over computer networks, and about the ways in which e-mail can be employed for this purpose. As in the USA, the growth of academic computer networks throughout Europe has been spectacular, but fraught with difficulties arising partly out of the wide variations in the quality of communication lines, especially in the former Soviet-bloc nations, and partly out of the limited set of letters and other characters available for e-mail transmissions.

Most people reading this article have probably never given much thought to the phrase “Content-transfer-encoding: 7BIT” which normally appears near the end of the “header” section in the e-mail we receive. However, once one has the need to write in languages that require letters with diacritics such as Å, ç, or ñ, the restriction to the “lower ASCII set” becomes quite annoying. In the case of material such as word-processed documents, databases, and compiled programs, the seven-bit limitation makes it very hard to transmit data efficiently (see the upper box on opposite page). Several people at the conference pointed out that there are a number of programs available that can convert eight-bit material to seven-bit pure text without excessive “overhead.” Perhaps the most widely used of these conversion programs is UUENCODE / UUDECODE, a freeware set available by Anonymous FTP (see lower box, opposite) from many sites, including one at SUNY—Stony Brook, math.sunysb.edu, the large archives at Washington University in St. Louis, ftp.wustl.edu, and, for your European correspondents, keos.helsinki.fi, in Finland. A comparatively new solution to the problem is MIME, an automatic encoding standard now being included in mailing software (upper box).

Many foreign e-mail systems, furthermore, can work efficiently only when the largest block transmitted is around 40 to 50 kilobytes long. Fortunately, most good communications-conversion programs allow the user to choose the size of output blocks. I have used UUENCODE successfully on several occa-

Professor Goelet is a member of the Department of Near Eastern Languages and Literatures (FAS), where he teaches Egyptian Language and Culture.
sions to send European colleagues testing versions of a Windows program on which I am working. Since time is of the essence when working with lengthy transmissions, it is usually advisable to compress files with archiving utilities before sending the material.

The Unfulfilled Promise of Scanners and OCR

When the first OCR (optical character recognition) programs were placed on the market, many scholars saw their potential immediately. Here was a device that would spare them from the time-consuming drudgery of retyping printed data such as bibliographies for use in databases and word-processed documents. All they would have to do was run the original through a scanner and pass the resulting image through the OCR routine, and voila! — they would have character-based files to use.

Not quite. The Centre for Computer-Aided Egyptological Research at Utrecht University embarked on a project to scan the entire Annual Egyptological Bibliography and convert it into a database format. The result of their efforts was quite surprising — yet, through the comments of other conference participants, rather typical.

Commercial OCR programs advertise success rates of 97 percent to 98 percent, which is impressive until one considers that on an average, 2000-character page there will be 40 to 60 errors — which the users themselves must find by proofreading the results. Actually, these high success rates seem to be based on documents which have large nonproportional type such as clean typewriter output — quite unlike most heavily footnoted academic material, where small print, tightly spaced type, and several foreign languages are generally the rule.

The Centre’s experience with the less-than-ideal material — written in five different languages, printed mostly in 8-point type, like this — was that the failure rate became so high that they calculated that it might be cheaper to hire a good typist instead if fewer than 20,000 pages were to be converted. Of course, the wage scales, scanner prices and software costs the Centre projected can vary greatly according to circumstances, but their estimate nevertheless underscores the time-consuming nature of correcting OCR conversions.

The Centre developed a time-saving technique in which the scanned image was analyzed by two different OCR interpreters, after which the results were compared through a comparison program. Unfortunately, MIME is not yet universally available; until it is, there will be some problems of interoperability.

More Characters with MIME

Ordinary e-mail is restricted by convention to using seven data bits for each character in its messages. With seven bits that can be either on or off, a maximum of 128 characters (2^7) can be represented. For all practical purposes, this means the “lower ASCII” character set (essentially the characters on an ordinary keyboard, represented by ASCII codes 33 to 128; the first 32 are instructions such as “carriage return”). Many characters with diacritals are included in the “upper ASCII” set (through number 256); these are available in most word-processors, but require an additional data bit for each character (256 = 2^8). Since e-mail is restricted to seven bits, any upper-ASCII characters used must be specially encoded, as with UUENCODE, before they can be transmitted.

A relatively new technical standard, MIME (Multipurpose Internet Mail Extensions) is now being included in some e-mail programs to do the encoding. The sender can write a message including the extended ASCII set; when the message is sent, it is automatically encoded. If the recipient also has a MIME-compliant mailer, the message will be accurately decoded when the mail is opened. Unfortunately, MIME is not yet universally available; until it is, there will be some problems of interoperability.

Getting Files by Anonymous FTP

File Transfer Protocol (FTP) is a very effective tool used to transfer files from or to another computer. If you have an ACF account, you can use a procedure called Anonymous FTP to gain access to a growing number of archives of text, images, and software on the Internet.

Here’s how to do it if you have an ACF EMIS Account: At the main menu, select 5. Software, then 2. Communications, then 4. FTP. You need to know the Internet name of the “host” computer on which the archive resides, such as ftp.wustl.edu, but you do not need an account on the system; simply type anonymous when prompted for your username and give your e-mail address as your password; if you are not prompted, precede them with user and pass, respectively. Once you’ve logged in, typing dir pub will usually give you a listing of files for public access; then, if you want one of the files, type get and the filename to have it transferred to you. For more details, see the March 1992 issue of this newsletter.
Internet Data Transfer Available Through NYU’s Data Consortium Membership

by Frank LoPresti
lopresti@acfcluster.nyu.edu

NYU researchers can now receive Census datasets over the Internet. The statistics group of the ACF is pleased to announce an enhanced electronic file-transferring facility within the Inter-university Consortium for Political and Social Research (ICPSR). NYU’s membership in the consortium has allowed researchers to order datasets from ICPSR’s vast collection. Past articles in this newsletter have detailed how to search the data catalog on ICPSR’s Gopher server over the NYU CWIS. In the past, data could be ordered over the Internet, but had to be delivered overland on conventional computer tapes or CD-ROMs — a process taking several weeks.

Now, in addition to tapes, diskettes, and CD-ROMs, the data can be obtained over the Internet via FTP (file transfer protocol). At this stage, only a limited set of ICPSR holdings is available via FTP (see the box on page 11). NYU researchers will need to arrange with the ACF Statistics staff for specific details and passwords. For more information, see the box at left.

Explore and Extract: Services to Facilitate Analysis of US Census Data

Two new services available through ICPSR offer Internet access to one of the most-used Census datasets — the US 1990 Census Public Use Microdata Samples (PUMS) 5-Percent and 1-Percent Samples (ICPSR 9952 and 9951). The ACF Statistics group can set up accounts for NYU researchers (see box for specifics).

Previously, the large size of these datasets, filling up to 24 reels of magnetic tape, made it difficult for researchers, even those with access to powerful computing systems, to work effectively with these data. That barrier to use is starting to come down. Now it is possible to use two tools — programs called Explore and Extract — to work on the PUMS data.

Explore

Users of Explore can generate cross-tabulations and percentages of variables as well as means and medians. Results of queries are available in one- or two-variable tables. Users can also specify as many as ten filter variables to narrow an analysis to a subset of the records in the dataset.

A user could employ Explore, for example, to investigate income differences between men and women in the United States. The researcher might
The query still might not be satisfactory, since it does not control for education, race, or state, or for a whole set of other variables. But because Explore queries are interactive and generally take less than ten seconds, a researcher can rapidly examine the effects of adding and subtracting any variable from the more than two hundred variables in the PUMS dataset.

**Extract**

Extract makes it possible to prepare subsets of either PUMS or CPS datasets. Extract rectangularizes the data file to facilitate importation into a statistical package for further analysis. Explore can be used to identify the variables and records of choice, and Extract can then be employed to generate a dataset for analysis. (Note that this Extract utility is not the same as the utility provided on the U.S. Census PUMS CD-ROM.)

As an example of the use of Extract, let’s continue the income-and-gender question from above. Once the researcher has identified the variables and subset of records of interest using Explore, Extract can be used to create a new dataset with those variables and records that can be used with a statistical package for more sophisticated analysis. For example, a researcher may want to perform a multivariate regression analysis using age, gender, and education as independent variables with income as a dependent variable. While Explore lacks the analytic capabilities for this type of analysis, Extract can be used to facilitate such an analysis using the researcher’s statistical software of choice.

(For these descriptions of Explore and Extract, I am indebted to Christopher Davis of ICPSR.)
Books about the Internet: Finding the Right Guide for Your Travels

Brian Kress

During the past year, the book industry has inundated us with titles dealing with the Internet. Much of this flood can be attributed to the enormous success of Ed Krol's *The Whole Internet: User's Guide and Catalogue* published by O'Reilly and Associates. However, some books found on the Internet bandwagon are disappointing, often redundant. Almost every title available can be used by a beginner, but one thing I have yet to see is a book geared towards experts. In order to help you find the right book, here are some of the most popular titles available at the NYU Computer Store, with my personal ratings:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*****</td>
<td>Excellent, highly recommended</td>
</tr>
<tr>
<td>****</td>
<td>Very good</td>
</tr>
<tr>
<td>***</td>
<td>Fair</td>
</tr>
<tr>
<td>*</td>
<td>Poor</td>
</tr>
</tbody>
</table>

### Comprehensive Guides

*The Whole Internet: User's Guide and Catalogue* by Ed Krol (O'Reilly, $24.95). One of the first guides for both beginners and experienced Internet users, and still probably the finest. Covers subjects like how to get onto the Internet, explains utilities like Telnet, and includes an extensive resource catalog. (Second edition is in the works.)


*Using the Internet* by William Tolhurst (Prentice Hall Computer, $39.95). A thorough how-to and reference in Que's *Using...* series. Although costly, it is an excellent guide to setting up your computer and logging on to network services. Includes a moderate-sized reference of services and a free floppy of WinNET software, an indexed list of mailing lists and newsgroups, and a utility for searching lists.

#### Beginner's How-To

*The Internet Roadmap* by Bennett Falk (Sybex, $12.99). Brief introductory guide that tries to cover every aspect of the Internet, although not very successfully. Includes a short directory of resources. Basics; for beginners only.

*The Internet Companion Plus* by Tracey LaQuey with Jeanne L. Ryer (Addison-Wesley, $19.95). Small pocket-sized guide book (with intro by Vice-President Al Gore, no less) that acts as a start-up kit for new users. Use it once and toss it. Includes a start-up diskette. (Expanded from first edition.)

*Zen and the Art of the Internet: Beginner's Guide* by Brendan P. Kehoe (Prentice-Hall, $22.00). Covers the basics only; not a very good reference. Let's hope the impending second edition is better.

*Internet for Dummies* by John R. Levine and Carol Baroudi (IDG, $19.95). Not everything in the world should take this angle of instruction. Trite. For beginners only. (Tip: Stick to *DOS for Dummies*.)

### Intermediate Users

*Hands-On Internet* by David Sachs and Henry Stair (Prentice-Hall, $27.95). Beginner's guide for DOS users or any non-Unix user. Step-by-step walk-through, with references and mailing lists.
Apple to Demonstrate PowerPC at the ACF

On March 24, the Academic Computing Facility and the NYU Computer Store will sponsor a demonstration of the new PowerPC chip by Apple Computer representative Robin Faltz.

The PowerPC chip is being developed by Motorola, IBM, and Apple. Based on IBM’s POWER architecture, it uses the latest RISC (reduced-instruction-set computing) technology to simplify the processor’s architecture and thereby increase its speed and efficiency. According to Ms. Faltz, the salient features are:

- Superior performance and compatibility. With a PowerPC-equipped Macintosh, you can run Windows and DOS programs, as well as Mac software.
- Integration with existing technology for higher levels of efficiency and productivity.
- Up to four times as much power as current machines.

Apple has committed itself to using the new chip in all of its future lines of computers, and will offer numerous upgrade options. The presentation will include the demonstration of a Macintosh Quadra computer upgraded to PowerPC.

There will be three hour-and-a-half presentations, at 10:00 am, 1:30 pm, and 3:30 pm, in room 313 of Warren Weaver Hall (251 Mercer Street). All are welcome; please help us plan by calling 998-3333.


General

Doing Business on the Internet by Mary J. Cronin (Van Nostrand Reinhold, $29.95). Admirable for its original format. More of the theory behind business relations on the Internet. There is not one diagram or reproduced line of communication in this book. Another cover-to-cover read. Teach yourself how to utilize better business practices through the Internet.

Exploring the Internet by Carl Malamud (Prentice-Hall, $26.95). Strictly a nontechnical travelogue of the author’s experiences on the Internet. I recommend you read this book from cover to cover if you want to gain any informative insight.

References

The Internet Directory by Eric Braun (Fawcett, $25.00). Very large and thorough reference. Not a teaching guide but an extensive listing of mailing lists, newsgroups, library catalogs, file-transfer archives, etc. Less a how-to than a what-you-can-do. ****

The Internet Complete Reference by Harley Hahn and Rick Stout (McGraw-Hill, $29.95). A complete introduction for beginners and a reference useful for both new and advanced users alike. Similar to Tolhurst’s book. Includes one month free access to different available on-line services. ****

Internet: Mailing Lists by Edward T. L. Hardie and Vivian Neou (Prentice-Hall, $29.00). Complete A-to-Z of mailing lists. Nothing more, nothing less. The only drawback is that it needs constant updating to keep up with all the new lists. ****

Connecting to the Internet by Susan Estrada (O’Reilly, $15.95). An intermediate-level book which doesn’t include how-to hints. What it does include are descriptions of the different types of connections and services available as well as their prices. ****


The Instant Internet Guide by Brent Heslop and David Angell (Addison-Wesley, $14.95). This book is not really all that informative. You may find its cutesy tone a bit much. Such a small book should not try to cover the Internet. Hardly worth a single star.*
The Visual Computer: ACF Colloquium on an Instructional Program from Stern

David Frederickson with Estelle Hochberg
frederickson@acfcluster.nyu.edu • hochberg@nyu.edu

Is it possible to explain to nontechnical "poets and plumbers" how computers actually work, rather than just how to use them? Is there any point in doing so? Professor Shimon Schocken, of the Department of Information Systems (Stern), would answer yes to both questions.

"To participate knowledgeably in shaping future technology and public policies," notes Professor Schocken, "people need a basic understanding of how computers work. If we wish our students to become intelligent consumers rather than naive users of computer technology, we must teach them something beyond the use of off-the-shelf packages." And he has backed his words with deeds; over the past ten years, he has experimented with innovative teaching techniques designed to give people with little or no technical background a rigorous overview of what computers can and cannot do.

At a very well-attended NYU colloquium in Warren Weaver Hall on February 4, Professor Schocken introduced Vic to the NYU community. Vic — The Visual Computer — is an interactive, PC-based program that embodies his ideas and teaching materials. It uses animation and multimedia to introduce concepts fundamental to the design of computer hardware, software, programming, and operating systems.

Underlying Vic is Professor Schocken’s view that the computer can be constructed as a gradual progression of surprisingly simple ideas. Thus, Vic starts by acquainting students with an elementary Von Neumann machine. Next, the program guides students as they gradually extend the machine’s hardware and software.

Assemblers, compilers, peripheral equipment, and elements of hardware and software are added — until the students have "built" a fully-configured personal computer and a multi-tasking operating system. The students end their journey by using the machines.

The screen that represents Vic’s basic system unit. The part on the left represents the input and output buffers; on the right is the main memory, where the program and the data are stored; in the middle is the central processing unit. (In later stages, the input and output buffers are connected to working simulations of a keyboard and monitor.) When a program is loaded into Vic, its code (a series of three-digit numbers) occupies the top part of Vic’s main memory. As the program runs, the user sees the current step highlighted there, and watches the data "bytes" (also three-digit numbers) as they move to and from the machine’s buffers, registers, and memory cells. After playing with Vic’s machine language, the user is introduced to an assembler and a subset of Pascal.
More Colloquia in April: Perseus Project and EDGAR

At this writing, two more in the NYU series of colloquia on uses of computers and communication have been scheduled for April. Both are about sophisticated databases — one in the classics, the other on public corporations — and the tools to deal with them. (For more information on the ACF- and FAS-sponsored colloquia, see box below.)

The Perseus Project is a large hypermedia database for classicists and archaeologists, comprising original texts (Greek and English translations), graphic images, and maps and tools. It has been under development for more than six years; the first version was presented on these pages and in a colloquium at NYU in early 1991.

On Friday, April 8, Professor Elli Mylonas of Harvard’s Department of Classics will discuss the issues faced by the team of developers in building Perseus, and their aims in the augmented Perseus 2.0. She will speak at 2:00 in Warren Weaver Hall, room 109.

Professor Ajit Kambil of the Stern School of Business will speak on April 29 on the plans to make the Security and Exchange Commission’s EDGAR database available on the Internet. The Stern School of Business — in conjunction with the Internet Multicasting Service, a non-profit corporation located in Washington, D.C. that specializes in disseminating information on the Internet — will be participating in a project sponsored by the National Science Foundation to provide free access on the Internet to the EDGAR database. This project has two goals. First, it is a demonstration project to provide concrete guidance and techniques on how large government archives of public data can be made available to the general public on the Internet. Second, the project has the goal of developing new tools for accessing and disseminating such data.

EDGAR (Electronic Data Gathering and Retrieval) is an online filing system mandated by the SEC for America’s largest corporations. It contains key public-disclosure information needed by consumers, researchers, and workers in the financial services industries. The database includes documents such as the 10-K and 10-Q reports required of corporations on the New York and American stock exchanges, filings by companies trading over the counter, and a variety of other registration statements, ownership reports, and annual and quarterly reports. This is the first time the database will be freely available in electronic form over the Internet. It is commercially available in electronic form through Mead Data Central, Disclosure and other vendors.

Professor Kambil will discuss the type of information contained in the EDGAR database, the goals of the project, and the means by which users will be able to access the material.

that they have constructed to design a word-processor, a database manager, a spreadsheet program, and a windowing package.

Vic makes extensive use of visual metaphors that have been shown to be quite effective in quickly conveying complex technical ideas to nontechnical audiences. Professor Schocken suggests that Vic provides a sound conceptual platform for introductory courses that go on to explore commercial software packages in greater detail. He plans to make copies of the Vic software available to members of the NYU community in the fall 1994 semester; for more information, contact him at schocken@stern.nyu.edu.

This colloquium was part of a series described more fully at right. It was sponsored by NYU’s Academic Computing Facility, the Faculty of Arts and Science, the Information Systems Department (Stern School of Business), the Graphic Communications Program (Culture and Communications, School of Education), and the FAS Department of Computer Science, with support from Apple Computer, Inc.

NYU Colloquia on Computers and Communications

This popular series of colloquia on uses of computers and communications is sponsored by the ACF and the Faculty of Arts and Science, with support from Apple Computer, Inc. Individual colloquia are co-sponsored by additional University departments, depending on the topic. The colloquia are open to all NYU faculty, staff, and students. The remaining presentations in the spring series will be announced in NYU Events, the University’s bi-weekly calendar, and on the NYU CWIS, and flyers will be mailed to all NYU faculty. To receive an e-mail flyer, ask to be added to the ACF’s mailing list: either call 998-3333 or send e-mail to document@acfccluster.nyu.edu.

Since the spring of 1993, all the colloquia have been videotaped. Copies may be borrowed from the ACF Documentation Office, Warren Weaver Hall, room 312 (998-3036).
Surgical Simulation Toolkit: A Modular Virtual-Reality Environment

Martin Nachbar, MD, Eric Nadler, and Leo Villareal
nachbar@mcclb0.mednyu.edu • nadlere@acf2.nyu.edu • villarll@acf2.nyu.edu

Increasingly, emerging technologies of computation, visualization, imaging, and video are being employed in the operating room. They are rapidly changing the way surgery is done and drastically altering the way surgeons are trained.

Gall-bladder surgery is a prime example of the impact of the new technologies. Ten years ago such surgery generally meant an abdominal incision 10 to 15 centimeters long. The surgical field was open to the surgeon's view. Recovery required five days to a week in the hospital.

The advent of the fiber-optic scope (laparoscope) in 1987 changed both the surgery and the recovery period. In the new procedure, four small incisions (1 to 2 centimeters) allow trochars, a video camera, retractors, and other instruments to enter the abdomen. The surgeon never sees the abdominal structures directly, but views the surgical field on a television monitor. Patients generally go home within forty-eight hours.

However, surgeons have encountered some difficulties. The camera is not aligned to the orientation of the surgeon, but is often at right angles to the surgeon's line of sight, which makes manipulation of the instruments counterintuitive and leaves the physician without proper spatial orientation. Moreover, the camera is not stereoscopic, depriving the surgeon of depth perception. The instruments are long, with

A Joint Development of the Hippocrates Project and the Interactive Telecommunications Program (TSOA)

In an undertaking of this complex and specialized nature, it is crucial to assemble a smoothly working team which, driven by end-user needs, blends expertise in surgery with abilities in computation, art, and user interface. The longstanding collaboration between the Hippocrates Project of the NYU School of Medicine and the Interactive Telecommunications Program (ITP) of NYU’s Tisch School of the Arts has laid the foundation for such an enterprise.

Established in the summer of 1987, the Hippocrates Project is a multi-disciplinary effort that explores the ways that information technology can augment the learning process (see previous reports on the project in previous issues of this newsletter, in May 1990 and March/May 1991). It is one of the most successful programs of its type, as measured by the degree to which material developed has penetrated the curriculum, and the breadth of participation of faculty and students in creating learning modules. The latest foray into the realm of virtual reality seems a natural extension of its mandate to define the role of technology in education.

Participants in the surgical simulation project include Eric Nadler and Leo Villareal, both master’s candidates at ITP; Red Burns, the Chair of ITP; Christine Siegel of the Hippocrates staff; and Dr. Martin Nachbar, Director of the Hippocrates Project. However, none of this would have been possible without Dr. Gene Coppa, the Director of Surgical Residency Training at the NYU Medical Center, who hatched the idea and is guiding the project development.
the handle far from the functioning end, so tactile feedback is absent. To further compound the difficulty, the instruments are divided among a team of two surgeons and a camera operator.

Why, then is laparoscopic surgery being used? Simply put, it is much less expensive, both in its human costs — the discomfort and time lost to the patient — and in the cost of the hospitalization. Given the present health-care climate, the results of laparoscopic surgery provide a compelling argument for expanding this use of technology. It is now estimated that in five years, nearly 80 percent of general surgical procedures will be performed via laparoscopy.

Training for Laparoscopy
Preparation for this type of surgery is difficult. Instrument manufacturers have provided training sessions using live adult pigs. This is expensive and does not create an entirely adequate simulation. Traditional apprenticeship is inadequate as well; due to the nature of laparoscopy, one person carries out almost the entire procedure.

The Surgical Simulation Toolkit is intended to address these training deficiencies. It is a computer-based surgery simulator that uses the technology of virtual reality to create a realistic surgical simulation that can provide the necessary training. In this environment, both the camera view and the interaction of actual surgical instruments are represented. The view of the camera is simulated in real time. Surgical instruments are tracked and appear in the computer-generated camera view. The simulator is designed in actual scale, so that a team of doctors can work together just as they do during surgery. The Toolkit is being designed as an adaptable system. New instruments, surgical procedures, and output devices — such as head-mounted displays — can be plugged into the current system. The toolkit's development plan includes:

* creation of a photorealistic visual simulator
* integration of force-output hardware so that the physical feel of actual surgery can be simulated
* programming of reusable modules that can be employed in developing new simulations

Development Environment
Three-dimensional models of abdominal structures and of surgical instruments are created on a Macintosh Quadra 950 computer and transferred to a Silicon Graphics Iris 4D/320GTX workstation where they are rendered in a three-dimensional world. Real instruments, fitted with sensing devices, transmit the coordinates of the instrument's location to the software running on the Macintosh. The representations of the instruments on the screen are displayed accordingly, and move as the real instruments are moved. Each organ, structure, function, and instrument is a separate data object in the software and on screen. The objects are combined to form the virtual world.

The system is in its first stage of development, and currently consists of a variety of off-the-shelf hardware and software. This prototype will hope-
(Top) Video image of an actual laparoscopic operation. (Middle) A wireframe rendering of the same procedure. The wireframe, a preliminary stage in three-dimensional simulation, can be manipulated onscreen more rapidly than a full rendering. (Bottom) Full three-dimesional renderings of two stages of a similar operation as produced in real time by the Surgical Simulation Toolkit.

fully indicate design challenges and issues. With it, the user should be able to conquer the problems of spatial disorientation and the lack of stereoscopic vision, and also to learn how to manipulate surgical tools in the constraining ports of entry.

These initial efforts are aimed toward creating a simulation that looks as much as possible like actual surgery. But it should be possible to expand the simulation or to augment actual surgery by showing views that a camera could never show. In addition, as the technology of laparoscopic surgery progresses, the simulation trainer will be appropriately upgraded.

Indeed, the system may actually evoke ideas and lead to the development of new instruments and surgical procedures. We hope that the system, by incorporating the data and images of non-invasive radiology (i.e., computed tomography and magnetic resonance imaging) might evolve into a surgical assistant that will provide images and information about the patient during actual surgery.

For further information on the Surgical Simulation Toolkit or the Hippocrates Project, please contact Dr. Martin Nachbar, Hippocrates Project, NYU School of Medicine, 550 First Avenue, New York, NY 10016.
Software for Scientific Computing and Visualization at the ACF

Edward Friedman with Frances Bauer and David White
friedman@acfcluster.nyu.edu • bauer@acfcluster.nyu.edu • whited@acfcluster.nyu.edu

The Academic Computing Facility provides an array of software for use in scientific computation, visualization, and graphics, on all platforms from PC to parallel computers. Most of the programs are listed in the tables on these pages, grouped according to the platform on which they run. Many of them have been featured in past issues of this newsletter. We are continually evaluating new programs and will make available those we feel will be useful to the NYU community; look for future articles, as well as notices on NYU CWIS (see page 3; first select Academic Computing and Networking Resources, then Academic Computing Facility, then Science and Visualization Resources).

(There is also a wealth of statistical and graphical software on ACF systems. For information, contact Frank LoPresti at 998-3398.)

Besides the dozens of software packages listed in the tables, there are at least half a dozen highly sophisticated and specialized software packages under development at the ACF Scientific Visualization Center. They include systems
• to visualize three-dimensional fluid flow through the human heart,
• to reconstruct three-dimensional images of the human skull,
• to analyze the surface of vertebrate skulls,
• to analyze robotic paths,
• to reconstruct three-dimensional images of the human brain,
• to teach laparoscopic surgery (see pages 18 to 20),
• to study chaotic systems.

The software is available in four places: the ACF servers for microcom-

### Microcomputer Software (Macintosh and PC)

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

<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>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, 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>Spyglass (Transform, View, Format, Dicer)</td>
<td>Pr</td>
<td>Spyglass, Inc.</td>
</tr>
</tbody>
</table>

Matlab is also available on the servers for IBM-type PCs. In addition, the following is mounted on a PC in the Innovation Center (Warren Weaver Hall, second floor):

<table>
<thead>
<tr>
<th>Software</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>ArcView (GIS)</td>
<td>Pr</td>
<td>ESRI (Environmental Systems Research Institute)</td>
</tr>
</tbody>
</table>

See the text of the article for an explanation of the abbreviations.
computers connected to NYU-NET, and three shared computer systems of the ACF: the Silicon Graphics machines in the Scientific Visualization Center (Warren Weaver Hall, room 317), the Center for Applied Parallel Computing (a joint ACF-IBM project whose RS/6000 machines are accessed by special arrangement), and the other shared systems, such as the DEC 5900. Some of the programs listed here have modules that are computationally very demanding. An example is Discover, part of the Biosym suite of software.

**Sources and Licenses**

The software comes from a wide variety of sources — commercial, academic, and governmental — given in the tables here under the heading Origin. Several software packages come from the supercomputer centers supported by the National Science Foundation (NSF), and their names are abbreviated in the tables:

- **NCSA**: National Center for Supercomputing Applications, Champaign-Urbana, Illinois
- **NCAR**: National Center for Atmospheric Research, Boulder, Colorado
- **PSC**: Pittsburgh Supercomputer Center, Pennsylvania
- **SDSC**: San Diego Supercomputer Center, California

(For more about the supercomputer centers, see the article in the September 1993 issue of this newsletter.)

In terms of ownership and licenses, software can be classed into three broad types:

- **(Pr) Proprietary**: Intellectual property owned and 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 or no fee, with the expectation that the user will pay fees in the future for new releases. 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. Much of the software listed in these tables is governed by licensing restrictions; the appropriate licenses are

### Software at the Scientific Visualization Center

Silicon Graphics machines at the Scientific Visualization Center have the following software, which can be grouped into four categories:

#### 1. General Purpose and Scientific Visualization

<table>
<thead>
<tr>
<th>Software</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explorer</td>
<td>Pr</td>
<td>Silicon Graphics</td>
</tr>
<tr>
<td>GPlot</td>
<td>PD</td>
<td>PSC/NSF</td>
</tr>
<tr>
<td>Image Tools</td>
<td>PD</td>
<td>SDSC/NSF</td>
</tr>
<tr>
<td>Khoros</td>
<td>Sh</td>
<td>U. of New Mexico</td>
</tr>
<tr>
<td>Matlab</td>
<td>Pr</td>
<td>Mathworks</td>
</tr>
<tr>
<td>Mosaic (World-Wide Web browsing)</td>
<td>PD</td>
<td>NCSA/NSF</td>
</tr>
<tr>
<td>HDF</td>
<td>PD</td>
<td>NCSA/NSF</td>
</tr>
<tr>
<td>NCAR-GKS</td>
<td>Sh</td>
<td>NCAR/NSF</td>
</tr>
<tr>
<td>NetCDF</td>
<td>PD</td>
<td>NCAR/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

<table>
<thead>
<tr>
<th>Software</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amber</td>
<td>Sh</td>
<td>U. of Calif. at San Francisco</td>
</tr>
<tr>
<td>Chem-X</td>
<td>Pr</td>
<td>Chemical Design, Oxford UK</td>
</tr>
<tr>
<td>FRODO</td>
<td>Pr</td>
<td>U. of Calif. at San Diego</td>
</tr>
<tr>
<td>Gaussian 92</td>
<td>Pr</td>
<td>Gaussian, Inc.</td>
</tr>
<tr>
<td>Insight/Discover</td>
<td>Pr</td>
<td>Biosym Technologies</td>
</tr>
<tr>
<td>Macromodel</td>
<td>Pr</td>
<td>Columbia U.</td>
</tr>
<tr>
<td>MDMovie</td>
<td>Pr</td>
<td>SDSC/NSF</td>
</tr>
<tr>
<td>Spartan</td>
<td>Pr</td>
<td>Wavefunction, Inc.</td>
</tr>
<tr>
<td>Xmol</td>
<td>Pr</td>
<td>Minnesota Supercomputer Center</td>
</tr>
</tbody>
</table>

#### 3. Physical Sciences, Mathematics, and Engineering

<table>
<thead>
<tr>
<th>Software</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cequi.BYU (Engineering)</td>
<td>Pr</td>
<td>Brigham Young U.</td>
</tr>
<tr>
<td>Minview (Fluid Flow)</td>
<td>PD</td>
<td>U. of Minnesota</td>
</tr>
<tr>
<td>Visual3 (Fluid Flow)</td>
<td>Pr</td>
<td>MIT</td>
</tr>
<tr>
<td>Vogl (Engineering)</td>
<td>PD</td>
<td>U. of Melbourne</td>
</tr>
</tbody>
</table>

#### 4. Geographical Information Systems (GIS)

<table>
<thead>
<tr>
<th>Software</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC/INFO</td>
<td>Pr</td>
<td>ESRI</td>
</tr>
<tr>
<td>GRASS, XGRASS</td>
<td>Sh</td>
<td>US Corp of Engineers</td>
</tr>
</tbody>
</table>

*See the text of the article for an explanation of the abbreviations.*
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, many researchers try to use public-domain or shareware programs whenever possible, and contribute to the development and maintenance of those programs. NIH Image is an example of a program developed through the cooperative efforts of people in many places (see Edward Huff’s story in the September 1993 issue of this newsletter). For details on the licenses, please contact Edward Friedman via e-mail at friedman@acfcluster.nyu.edu or by telephone at 998-3051.

<table>
<thead>
<tr>
<th>Software at the CAPC</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concert C (Parallel Programming)</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 (Distrib. Memory Parallelizer)</td>
<td>Pr</td>
<td>APR, Inc.</td>
</tr>
<tr>
<td>Forge 90 (HPC Tools)</td>
<td>Pr</td>
<td>APR, Inc.</td>
</tr>
<tr>
<td>Fortran 90 (Compiler)</td>
<td>Pr</td>
<td>NAG, Ltd.</td>
</tr>
<tr>
<td>Gaussian 92 (Chemistry, Biology)</td>
<td>Pr</td>
<td>Gaussian, Inc.</td>
</tr>
<tr>
<td>NAG Library (Math Library)</td>
<td>Pr</td>
<td>NAG, Ltd. Oxford</td>
</tr>
<tr>
<td>Network Linda &amp; C (Parallel Prog)</td>
<td>Pr</td>
<td>Scientific Computing</td>
</tr>
<tr>
<td>Parasoft Express (Parallel Prog)</td>
<td>Pr</td>
<td>Parasoft Corporation</td>
</tr>
<tr>
<td>PVM (Parallel Programming)</td>
<td>PD</td>
<td>U. of Tennessee, ORNL, and Emory U</td>
</tr>
<tr>
<td>PVMc (Parallel Programming)</td>
<td>Pr</td>
<td>IBM Endicott</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>
</tbody>
</table>

See the text of the article for an explanation of the abbreviations.

<table>
<thead>
<tr>
<th>Software on Other Shared ACF Systems</th>
<th>Type</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMLIB (Common Math Library)</td>
<td>PD</td>
<td>National Institute of Standards and Technology (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, Inc.</td>
</tr>
<tr>
<td>Matlab</td>
<td>Pr</td>
<td>Mathworks, Inc.</td>
</tr>
<tr>
<td>Mongo (Plot package)</td>
<td>Pr</td>
<td>MIT</td>
</tr>
<tr>
<td>Mosaic (World-Wide Web browsing)</td>
<td>PD</td>
<td>NCSA/NSF</td>
</tr>
<tr>
<td>NAG</td>
<td>Pr</td>
<td>NAG, Ltd.</td>
</tr>
<tr>
<td>NCAR-GKS Graphics</td>
<td>Sh</td>
<td>NCAR/NSF</td>
</tr>
<tr>
<td>NetLib</td>
<td>PD</td>
<td>Oak Ridge National Laboratory (ORNL) and U. of Tennessee</td>
</tr>
</tbody>
</table>

See the text of the article for an explanation of the abbreviations.

The Scientist on the Internet

The Scientist — a biweekly newspaper for scientists and the research community — is widely read by researchers, academics, and administrators. It covers current events that affect professional research — including funding legislation, new grants, employment and salary trends, career opportunities, ethics and so forth.

Issues from November 1992 onward are now available electronically — in full text and free of charge — on the Internet via FTP, Gopher (via NYU CWIS), and e-mail.

To get copies of The Scientist via FTP (File Transfer Protocol), log in to ftp ds.internic.net as anonymous, and for password, give your Internet address. At the ftp prompt, type cd pub/the-scientist

At the next prompt, type dir to list the files in that directory. To download an issue to your machine, type get and the number of the issue. To leave the server, type quit.

If you are using Gopher, connect to internic.net 70, and from the menus presented choose InterNIC Directory and Database Services (AT&T), then InterNIC Database Services (Public Databases), and finally The Scientist - Newsletter.

To request The Scientist from the AT&T e-mail server, send a message to mailserv@ds.internic.net with this message (typed in a single long line):

file /ftp/pub/the-scientist/the-scientist-yyyymmdd

Change "yyyyMMdd" to the date of the issue you want.
If you’ve had experience in producing animations in the traditional way — drawing cels, one or more for each frame of the final film — using a computer to produce animated sequences can be liberating, but it can be daunting as well. The computer can manipulate color and texture almost infinitely, it can automatically produce intermediate frames in a sequence, and it can “rotate” an image of a three-dimensional object on the screen. On the other hand, an animator has to learn to use many new tools, and the demand on computer resources — both computational power and digital storage — can be considerable.

A class called Introduction to Animation on the Macintosh, taught in the Department of Film and Television (Tisch School of the Arts) last semester by Professor Lorie Loeb (and this semester by John LaSala), tries to bridge the gap. It seeks to give experienced animators a grasp of the digital tools available — enough to be able to use several of the programs to produce an integrated whole. A few of the programs used are Adobe Photoshop, for scanning still images, manipulating them digitally, adjusting color, and the like; Fractal Design’s Painter, to create animated sequences and backgrounds; Scratch (a software program developed by Ken Perlin of the Department of Computer Science FAS) to create and test animations; and Video Fusion and Cosa’s AfterEffects for digitizing video sequences, editing, and special effects.

Each of the students produced a short animated sequence using several of the programs, based on the idea of the self-portrait. They also prepared transitional sequences in which the face of the author of one sequence morphed into that of the next (for more about morphing, see the January issue of this newsletter).

Working in the ACF’s Arts and Media Studio in the Education Building, the students were encouraged to experiment and to use as many of the software tools as they could integrate.
...emerges as a Regency dandy.

into the whole. But some of the more complicated effects demand several minutes to compute each frame, and at thirty frames a second, the time adds up. Another limitation for each sequence was the space on a 44-megabyte Syquest storage disk; an average of one megabyte of storage is needed for each second of animation, though a complex or high-resolution image takes more and a simple one less.

The students saved their output as QuickTime movies, which were then collected and output to video on the Avid system at the ACF Video-graphics Studio in Warren Weaver Hall, with the assistance of Philip Galanter. The result is an eight-minute video called *Anamorphosis*, selections of which are shown here. Of course the sequences all use color and motion. Neither can be shown on these pages, so the selection here is inevitably somewhat biased in favor of the ones that show up well as black-and-white stills.

— David Frederickson
with Lorie Loeb
frederickson@acfcluster.nyu.edu
loeb@acfcluster.nyu.edu

Above, Evette Vargas breaks her moving image into a dozen pieces, which spin slowly as the whole image rotates, then finally comes together again.

In Diane Shapiro’s sequence, at left, drawings of Asian dancers emit colored outlines that separate from the originals and perform their own dance.

At right, Anne Nakasone puts her self-portrait through the changes, morphing from a photograph through sketches of various sides of herself, and eventually back to her more photographic image — set off by a bed of roses.

Arts and Media Brown-Bag Lunches on Tech Concerns

The ACF will be sponsoring a monthly brown-bag lunch session for NYU technical staff and graduate students charged with maintaining technical environments such as computer labs, video and film production facilities, and recording studios, in support of artistic programs. There will usually be some kind of informal presentation, but also time will be allowed for free-form discussion of common problems, solutions, needs, and areas of interest.

For more information, contact Philip Galanter via e-mail at galanter@nyu.edu or by phone at 998-3041.
Industry Multimedia Seminar Series, Spring '94

Allison Druin
allison@play.cs.nyu.edu

Members of the NYU community are invited to sample the spring Multimedia Seminar Series for industry participants. Last fall, this lecture series was launched by the newly formed NYU Center for Digital Multimedia.

The fully subscribed spring series of thirteen sessions began on February 25, focusing on such topics as music, animation, software and hardware platforms, and multimedia applications for education, museums, and medicine. Lecturers are drawn from industry and from within the NYU community. All remaining lectures are on Fridays from 1:00 pm to 4:00 pm in room 101-A, Main Building.

- March 25: Multimedia Medical Environments (Susan Stensaas, Cornell Medical School; Martin Nachbar, NYU Medical Center)
- April 8: Part 1 — A Look at the Future of Multimedia: Virtual Reality and Immersive Environments (Rachel Strickland, Mike Neihmark, Margaret Minsky, Interval Research Corp.)
- April 15: Part 2 — A Look at the Future of Multimedia: Broadcast Multimedia (Craig Ullman, ACTV; Kenny Miller, Viacom)
- April 22: Part 3 — A Look at the Future of Multimedia: the NYU Media Research Laboratory (Ken Perlin, Allison Druin, Richard Wallace, Ben Bederson; NYU Media Research Laboratory)
- April 29: Animation Techniques for Multimedia (Mark Vopel, RGreenberg Associates)
- May 6: Multimedia Software Tools (Leo Hourvitz, Brøderbund)
- May 13: Sounds in Multimedia — MIDI Technologies and Computer Music (Robert Rowe, NYU Music Technologies Program) (Tom Rettig, Brøderbund)
- April 25: Networks and Communication Technologies (Mathew Smosna, NYU Courant Institute of Mathematical Sciences) (Judith Donath, MIT Media Lab)
- May 20: Multimedia Legal Issues (Jeffrey Neuburger, Brown Raysman & Millstein) (Patrick Montgomery, Archive New Media)

For more information on the series, contact Patrick Franc at 998-3519.

Allison Druin is the Seminar Coordinator for the NYU Center for Digital Multimedia. She is also a Research Scientist and founder of the newly established NYU Media Research Laboratory in the Courant Institute of Mathematical Sciences.

NYU Center for Digital Multimedia
The Center for Digital Multimedia at New York University was established this past fall with a grant from New York State’s Science and Technology Fund. The center’s mission is to help establish, foster, and promote the growing multimedia industry in the New York area. Under the direction of Professor Jacob Schwartz (CIMS), the center has established a seminar program for members of the industry as well as access centers where they can become better acquainted with various aspects and techniques of multimedia.
IBM Internships for CS Graduate Students

The Distributed Systems Software Technology group at IBM Research is actively involved in the design and implementation of a family of programming languages (called the Concert family of languages) that are appropriate for distributed programming in a heterogeneous network.

Each summer the group hosts a few outstanding graduate students in computer science; they work in close cooperation with the members of the group. This summer IBM is looking for students who have a demonstrated interest in programming languages, distributed systems, or graphical programming.

For more information, contact Josyula R. Rao at jrrao@watson.ibm.com or (914) 784-6692.

Meetings of Interest


5th Conference on College Teaching and Learning:
April 6–9, Jacksonville, Fla. For information, contact Jack Chambers at jchamber@fccj or (904) 632-3364.

27th Annual Simulation Symposium: April 11–15, La Jolla, Calif. For information, contact Patrick Dowd at dowd@eng.buffalo.edu or (716) 636-2406.

International Computing (continued from page 11)

nately, different OCR programs tend to make identical errors, such as interpreting a tightly spaced rn as an m, or an e as a c. The number of such errors can be diminished considerably by the simple expedients of carefully aligning the material on the scanner and using an enlarged photocopy of the document.

Spell-checkers can also be helpful, but only when the material is predominantly in one language. When analyzing texts such as name lists, though, spell-checkers are useful only as a source of unintended merriment, offering the most amazing (and occasionally perceptive) interpretations of colleagues’ names.

In my next article I hope to be able to discuss how Egyptologists have been able to adopt some other computer applications, such as animation and multilingual databasing.

Internet Data Transfer (continued from page 13)

tance to sustain acquisition, processing, and archiving of data. Furthermore, it is critical that the social sciences generally be able to document the value that they place on large and expensive publicly supported data collections, to ensure that these data will continue to be collected in the future. Reporting of research and instructional usage was also an integral component of a Joint Statistical Agreement between ICPSR and the U.S. Bureau of the Census that provides Bureau assistance for ICPSR’s acquisition of 1990 Census data files.

When ordering 1990 Census data files, you will be asked to state in some detail who you are and how you will use the files. For more detail, contact me at 998-3398 or at the above e-mail address.
The ACF’s Microcomputer Laboratories

From its five locations, the Academic Computing Facility provides a wide variety of computers and related services for faculty, research staff, and students. The map on the opposite page shows the ACF’s locations, and the hours of operation are listed beneath it.

For some ACF services, an account is required. Priority access to ACF microcomputers is available in some cases; contact the Accounts Office (998-3035) for more information.

The ACF offers hundreds of computers for use by members of the NYU community. For more information, pick up a brochure at any of the labs.

Access to the ACF’s Instructional Micro 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 current, valid NYU ID.

Obtaining an ACF 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 of operation and availability to general users and to holders of priority accounts, please see facing page.

The ACF recommends that instructors obtain an ACF Class Account whenever a course requires that students have access to computers. These accounts give students priority access to ACF computers, and the application procedure helps the ACF to ensure that the appropriate software and training sessions are available. Students in courses associated with class accounts can register for computer use at any ACF computer lab.

New Versions of Popular Software at the ACF Microcomputer Labs

Several popular programs at the ACF Microcomputer Labs have recently come out in new versions. Some of the programs have skipped several version numbers in order to match the DOS version — for instance, WordPerfect for the Macintosh has leapt from version 2.1 to 6.0. The following upgrades have been installed on the servers at the labs since the beginning of the year:

- Microsoft Word for DOS 6.0 (upgrading from version 5.2)
- MS Word for Windows 6.0 (upgrading from version 2.0)
- MS Works for the Mac 3.0 (upgrading from version 2.0)
- WordPerfect for DOS 6.0 (upgrading from version 5.1)
- WordPerfect for the Mac 6.0 (upgrading from version 2.1)

Other upgrades have been received recently, and will be put on the servers as soon as practicable. This involves, among other things, getting the most recent bug fixes and checking for incompatibilities with other items on the network:

- Borland C++ 4.0 (upgrading from version 3.1)
- WordPerfect for Windows 6.0 (upgrading from version 5.1)

Version 6.0 of MS Word for the Mac has also been ordered, but at this writing has not yet been released by Microsoft. When it arrives, it will be installed.

—Larry Mingione
mingione@acf2.nyu.edu
Important ACF Telephone Numbers

ACF HelpLine 998-3333
Account Information 998-3035
Computer Documentation 998-3036
Innovation Center 998-3044
Statistical Consultants 998-3434

Computer Labs:
14 Washington Place 998-3457
Tisch Hall 998-3409
Education Building 998-3421
Warren Weaver Hall 998-3456
Third Ave. North Res. Hall 998-3504

Dial-in Access to ACF Computers
To connect via modem to NYU-NET, NYU's campus-wide network, dial these numbers.

Modern Speed (bps)  Dial
300–2400  995-3600
9600, 14400  995-4343
300–1200  995-4356

*This number is recommended if you are using an older modem that has no error-correction.

Exceptions to regular hours: confirmed holiday schedules will be posted via our online news and bulletin board facilities, and ACF offices in Warren Weaver Hall are closed on University holidays.

Hours at ACF Labs

Regular Hours (for exceptions, see above, left)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14 Washington Place*</td>
<td>closed</td>
<td>8:30 am – 11:30 pm</td>
<td>8:30 am – 11:30 pm</td>
<td>8:30 am – 5:30 pm</td>
</tr>
<tr>
<td>Tisch Hall*</td>
<td>closed</td>
<td>8:30 am – 11:30 pm</td>
<td>8:30 am – 11:30 pm</td>
<td>8:30 am – 5:30 pm</td>
</tr>
<tr>
<td>Education Building*</td>
<td>closed</td>
<td>8:30 am – 11:30 pm</td>
<td>8:30 am – 11:30 pm</td>
<td>8:30 am – 5:30 pm</td>
</tr>
<tr>
<td>Third Ave. North</td>
<td>10:30 am – 1:30 am</td>
<td>10:30 am – 1:30 am</td>
<td>10:30 am – 5:30 pm</td>
<td>10:30 am – 5:30 pm</td>
</tr>
</tbody>
</table>

Consultant Hours:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14 Washington Place</td>
<td>closed</td>
<td>9:00 am – 9:00 pm</td>
<td>9:00 am – 9:00 pm</td>
<td>9:00 am – 5:00 pm</td>
</tr>
<tr>
<td>Tisch Hall</td>
<td>closed</td>
<td>9:00 am – 9:00 pm</td>
<td>9:00 am – 9:00 pm</td>
<td>9:00 am – 5:00 pm</td>
</tr>
<tr>
<td>Education Building</td>
<td>closed</td>
<td>9:00 am – 9:00 pm</td>
<td>9:00 am – 9:00 pm</td>
<td>9:00 am – 5:00 pm</td>
</tr>
<tr>
<td>Third Ave. North</td>
<td>10:30 am – 10:00 pm</td>
<td>10:30 am – 10:00 pm</td>
<td>10:30 am – 5:30 pm</td>
<td>10:30 am – 5:30 pm</td>
</tr>
</tbody>
</table>

*Available to general users from 8:30 am to 1:00 pm, Mon. through Fri., and to priority access account holders during all hours of operation.
Dealing with Success
Registrar and WAIS Team Up for Course Lists on NYU CWIS
What Is the NYU CWIS?
WAIS: Tool for Searching Gopherspace
AMC Puts Bulletin Board on NYU CWIS
Federal Register Available through ACF
Map: Where in the World is the Internet?
ACF HelpLine Q&A: Internet vs. Ethernet
What Is the NYU CWIS?
WAIS: Tool for Searching Gopherspace
AMC Puts Bulletin Board on NYU CWIS
Federal Register Available through ACF
Map: Where in the World is the Internet?
ACF HelpLine Q&A: Internet vs. Ethernet
Science and Visualization
Software for Scientific Computing and Visualization at the ACF
Newsbytes: The Scientist on the Internet
Arts and Media
TSOA Classes Meld Computer Animation, Morphing, and Digital Manipulation at ACF's Arts and Media Studio
Arts and Media Brown-Bag Lunches on Tech Concerns
Center for Digital Multimedia
Industry Multimedia Seminar Series, Spring '94
Upcoming Events
IBM Internships for Grad Students
Meetings of Interest
Microcomputers
The ACF's Microcomputer Labs
Access to the Micro Labs
Upgrades of Popular Software at Labs
Hours at ACF Micro Labs
Map: ACF Sites
In This Issue
March 1994

Published by the Academic Computing Facility of New York University
251 Mercer Street
New York, N.Y. 10012

Cover: Hippocrates enters Virtual Reality. A scene from the demonstration video for the Surgical Simulation Toolkit, from NYU's Hippocrates Project and ITP. See page 18.