Andrew

Andrew Consortium
School of Computer Science
Carnegie Mellon

The Andrew View

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Highlights in this Issue

ANDREW ON THE WEB

http://www.cs.cmu.edu:8001/afs/cs.cmu.edu/project/atk-ftp/web/andrew-home.html

My Own View - Human Computer Interaction

Wilfred J. Hansen, Director

The field of HCI--Human-Computer Interaction--is an emerging discipline which has as its goal the aim of making computers easier to use. There are too many examples of systems being difficult to use and therefore either ignored or used incorrectly (sometimes so badly as to exact considerable human suffering!!!).

Here at Carnegie Mellon, we have recently formed the Human-Computer Interface Institute (HCII), of which I am a charter member. The HCII is a vehicle for conversation and cooperation among those doing research on user interfaces and related human aspects. Members of the Institute come from departments across campus: Computer Science, Psychology, English, Design, and others. This allows the Institute to offer cross-disciplinary research bringing to bear a broad arsenal of methodologies. Many HCII members do work in the psychology of interaction, but the work of the Andrew Consortium is to provide tools that incorporate HCI results and make it easy to produce applications that adhere to good HCI principles.

During the formative years for the Andrew software, we did considerable research into the user interface. Experiments included over a dozen interfaces for scroll bars and two dozen for menus. Some of the work was summarized in a paper {Hansen, W. J., C. Haas, "Reading and Writing with Computers: a Framework for Explaining Differences in Performance", *Comm. ACM 31*, 9 (Sept, 1988)}. It is among those papers available from our ftp site (ftp.andrew.cmu.edu/pub/AUIS/papers/atk/...) or through our web page (http://www.cs.cmu.edu:8001/afs/cs.cmu.edu/project/atk-ftp/web/andrew-home.html).

The evolving Information Highway has become institutionalized as a set of request-for-proposals for research grants. Despite the fact that the beneficiaries of the Highway are alleged to be humans at the end of each road, most of the funding is aimed at the technical problems of making the highway work. If you feel, as I do, that the emphasis should be on the users of the Highway rather than the asphalt, you may wish to mention to those who got your votes that human-computer interaction is a crucial technology which deserves funding.

Here at the consortium our work on the new widgets package will incorporate some of our HCI expertise. In addition to our own work on this package, I will next term direct a class of students at the problem as an exercise in software engineering. For the results, stay tuned.

Software Developments

Andy Plotkin and Rob Ryan, Technical Staff

Have you Picked Up our Latest Bug Fixes? As most of our users know by now, the 6.3 release of Andrew in C offers new editors for drawings and images, improving your ability to create compound documents. The original Andrew 6.3 was distributed in the contrib/lib section of X.V11R6.

Many thanks to our users who pointed out VIBs (very important bugs) in release 6.3. These formed the basis for versions 6.3.1 and 6.3.2.

In addition to bug fixes, Andrew 6.3.1 offers support for AFS 3.3 and corrections to build problems and potential coredumps. Upgrade to version 6.3.1 in one of these two ways:

1. A patch is available as pub/AUIS/patches/official/patch.631 on ftp.andrew.cmu.edu (IP 128.2.232.154). When applied to your current auis-6.3 sources, this patch will bring Andrew release 6.3 sources up to date with release 6.3.1. See the README in the pub/AUIS/patches directory then use the following command when applying the patch:

```
patch -p < patch.631.
```

Note: Omitting the -p flag will cause the resulting sources to be inconsistent and unusable (broken!!!).

2. The directory pub/AUIS/dist-6.3 has six compressed tar files containing the sources for this latest release. See pub/AUIS/dist-6.3/README for instructions on assembling the sources from the tar files.

Andrew 6.3.2 fixes a potential cause of coredumps when AMS programs are given an invalid address. Upgrade to Andrew 6.3.2 by using 'patch.632' which fixes two files: overhead/mail/lib/parseadd.c and atk/atkvers/atkvers.num. The patch is located in the pub/AUIS/patches/official directory on our ftp server: ftp.andrew.cmu.edu. The README in that directory provides further instructions for applying the patch.

Members Only C++ Release We are entering the final stages of our work to convert the Andrew system from C to C++. As we convert the system to this widely-used language, the new version, Andrew 7.2, is being made available to members of the Consortium. (Contact our Assistant Director, AnnMarie Zanger <az28@andrew.cmu.edu> at the Andrew Consortium for information about becoming a member.) Here are a few of the features to look forward to from the Andrew 7 series:

Scrolling Works! In the past, scrolling backwards in text did not always work when trying to scroll by a distance less than the height of an inset. Now a new API has been introduced for scrolling. It allows a section of your document to be scrolled consistently, especially when insets are involved. The new scrolling scheme means that backward and forward scrolling always work, and always work as expected!

Dynamic Loading This feature is a valuable tool for Andrew development since it lets new insets be developed without waiting to re-link the entire system. Dynamic loading also avoids having a separate and huge executable for each application. Implementation of dynamic loading has been the last major piece of the C++ conversion. This latest development makes it possible for code in dynamic objects to call functions in other dynamic objects. This change greatly extends the number of classes which can be dynamically loaded, thus decreasing the size of the main executable.

Progress on Printing The new PostScript printing system now prints all the standard AUIS objects (text, figure, table, raster) as well as handling insets. Soon it will also be able to handle special text features such as table of contents, index, tags and references, widow/orphan control, and full-page text layout.

Recursive Search Previously when a document had text in buttons, tables and other embedded objects, text search sometimes could not find it. Now a new search method, "recursive search", has been implemented. A search with this mechanism will find the target string no matter where it is.

New from the Consortium

Susan Straub, Technical Staff

Binary Distribution Packages Encouraged by the large number of requests for binary distributions, particularly from Linux users, we are now making Andrew 6.3 available in similar formats for a number of popular platforms. Choose from among these four subsets or select the "full" option for all of Andrew:

- **wp** -basic word-processing system
- **doc** - the documentation set only
- **src** - tools for programming
- **mail** - message system with MIME-compatible messages interface
- **full** - all of the above, plus other goodies

The packages have been created for these five popular system types:

- RS/6000
- Sun 4C Sparcstation
- HP 720
- DEC Pmax
- Linux

You can obtain binary packages via anonymous ftp from ftp.andrew.cmu.edu (Internet: 128.2.232.154) in pub/AUIS/bin-dist. The README file in that directory provides information on the contents and on how to proceed.

The Consortium will also send you a binary package on tape for a nominal fee. (See "Facts on File-Andrew on Tape" for further details.)

Enhancements in the Works

The Linux Line
Terrence Gliedt, Consultant

A new distribution for Linux is coming. As mentioned in the previous section, this will contain several packages (subsets) of Andrew 6.3. You should expect to find these files at ***ftp.andrew.cmu.edu*** in *pub/AUIS/bin-dist/linux* and ***sunsite.unc.edu*** in *pub/Linux/X11/andrew*.

The new distribution contains a number of new things:

- Andrew now requires your system to support the QMAGIC executable format (for anyone using a kernel >= 1.0.0).

- It is now based on Andrew 6.3.1.

- This distribution was built on Slackware 2.0.1.

- Another iteration of HTMLTEXT, a WYSIWYG editor for creating HTML documents, is now available (thanks to Robert Kemmetmueller <rskm@vnet.ibm.com>).

- The application ***org*** was added to the *-src* package.

- Notes were added in the *README.ez.wp* describing in detail a good **.Xmodmap** for our German friends (thanks to Oliver Mai <mai@HP-Cluster.desy.de>).

- A new shell, ***setpapersize***, will configure your Andrew to print on A4 paper (thanks to Klaus Fueller <klausf@osgo.ks.he.schule.de> and others). You are prompted at install time to choose your paper size.

- Printing of German *umlauts* now works properly (thanks to Oliver Mai).

- ***ez2ps*** was corrected to use *groff* (thanks to Oliver Mai AGAIN).

Seems there are quite a few Andrew advocates cropping up in Germany these days! Ausgezeichnet!

Confusion looming Our friends in the XFree Consortium have released **XFree 3.0** for Linux. This is based on X11R6 and includes drivers for lots of previously unsupported video cards. Unfortunately for X applications, they also decided it was necessary to change the names of the X11 shared libraries. This brings an incompatibility for some Andrew users. All Andrew releases to date have been based on XFree 2.x (X11R5) on the Slackware distributions. This is still true for the coming release. XFree 3.x users will not be able to use this latest Linux distribution, unless they have also installed the older XFree2.x shared libraries.

Very soon, a Slackware 2.0.2 upgrade will lead to a conversion to the XFree3.0 distribution. At that time I will re-make Andrew and create a distribution for the new shared libraries. The names of these packages have yet to be set, but it will be obvious what is what. If all else fails, read the README.ez.* files.

This confusion will linger for the next few months until we all get converted to XFree3.x.

The World Wide Web Browser

Tom Neuendorffer, Consultant

The World Wide Web has become the medium of choice for the dissemination of information on the Internet. So the Andrew Consortium will soon offer a customized Worldwide Web Browser to help you wade through the oceans of information to be found there!

The goal of this project is to integrate the AUIS and Web environments as seamlessly as possible, in order to facilitate transference of information both to and from AUIS users. In the process, AUIS should become a first class environment for both accessing and creating Web documents.

A prototype is currently running which supports two different AUIS HTML objects, one written by Nick Williams of City University and the other by the folks at IBM Rochester. Using the prototype is much like using Mosaic or Netscape, one can download and view documents from the Web simply by clicking on hypertext links embedded in the documents themselves. In addition, weblink objects have been created to allow pointers to remote resources on the web to be included in any Andrew document. Text extensions have also been created so that, if you come across a URL in text, mail, etc , you can view it via a menu command or keystroke.

As soon as CERN releases it’s announced multi-threaded WWW library, I will be integrating that code into a browser that will be made generally available to the AUIS community.

Member Mentions

IBM Contributions to the System The IBM Corporation continues to play an important role in the development of Andrew. IBM has been a member of the Consortium since its inception, and indeed was a partner with Carnegie Mellon University in originally creating Andrew systems and software. IBM and its many programmers in Rochester, Minnesota continue to improve the system. They then share their enhancements with us and coordinate with our technical staff so that these improvements will ultimately reach you!

Here is a "grab bag" of the most recent system enhancements that are the result of IBM contributions and coordination with the Consortium. All of these can be found in Andrew 7.2:

Preferences

- directory editor to be used can be set by a preference
- added color preferences for the frame message line
- added a preference to skip the "This is the last window" warning dialog
- added an option for textview to display the insertion mark even when not the focus
- added a preference to give textview Mac-like behavior: cutting out the selection if the user types anything
- added a preference to control how much typescript scrolls when it needs to scroll

Bug Fixes

- "buffer::GetView" always returns a buffer of the right type
- fixed a bug where a wait-cursor was displayed while a dialog box was up
- "frame::SetBuffer" notifies observers of the change

User Customization

- added textview commands to extend the selection
- added textview commands to move the mark based on words delimited only by whitespace
- added attributes to text to set the background color, and to set it differently if the text is readonly
- allowed horizontal scrolling of text
- allow special keyboard keys (page up, etc) to be bound to commands
- allow im to provide the window visibility state and the modifier keys pressed during a mouse click

Other

- added "im::Beep" to allow applications to beep
- added "bufferlist::Sort"

IBM Working on HTMLTEXT Building on the work from Nick Williams at City College in London, Robert Kemmetmueller at IBM Rochester, Minnesota has created a new dynamic object called ***htmltext***. This provides substantially improved editing capabilities in *ez* for **.html** files. It's not quite yet everything you'd want, but its getting there. Terry Gliedt has been using it extensively and recommends it highly. "You're gonna love creating HTML documents with Andrew!" says Terry. This contributed code is available on our ftp server in the pub/AUIS/misc/html.v-*num*.tar.z file.

Results of the 1994 Survey of Andrew User Interface System Users

Susan Straub, Technical Staff

Every year, the Andrew Consortium gets in touch with its users over the Internet to find out what they think of Andrew. You may have been one of these users: our survey was included in the last issue of The Andrew View. We hope that you participated, but even if you didn't, we would still like to hear from you (see "Facts on File" below for further details).

Here is a brief summary of the results, based on responses from a group of Andrew users:

Respondent Sample This year, we heard from a little over twenty different organizations who told us about themselves and how they use Andrew. They also gave us plenty of suggestions for "future fixes" of the system which we are selectively "attacking".

Of the respondents, usage is split between educational organizations (10) and commercial ventures (10). Research institutions (2) and a private home (1) constitute the remainder of the sample. The respondents operate worldwide, residing from Massachusetts to Minnesota, California, Australia, Europe and points inbetween.

Andrew Installation Sites The majority of the respondents have small installations: 14 groups have less than ten users per site. Nine groups have more than ten users, three of which have over 1,000 users on site.

Like last year, the largest percentage of respondents use Suns, then DECs, HPs and IBMs. Based our small sample, a larger percentage of respondents are using Suns this year than last. The three sites having over 1000 users prefer the following system types: only RS/6000's, only HPs, and a mix of RS/6000, Suns, Ultrix and Vaxen. Other types of machines running Andrew include: Vax 4.3 bsd, SGI, IRIX, Linux and 386/BSD.

Almost three-fourths of the respondents have the same number of systems running AUIS as they have users. Of the remaining respondents, one-half have more machines than users while the other half have more users than machines. One-third of the respondents indicated that they run AUIS on multiple platforms.

How Andrew is Used When asked how they are using Andrew, over two-thirds told us about usage of both mail/bboard/news groups and document production.

Only a handful of respondents said that they were using Andrew for user interface prototyping and development (but we know that there are a whole lot more of you out there).

Some of the other chief uses for Andrew include: programming, establishing a common user environment across multiple platforms, using NEOS for formatted paper exchange and annotation, using ez as a programmer's editor, obtaining the bush and help features, installing a messages system, and even viewing documents created in WordPerfect .

The Most Commonly Requested Enhancements to Andrew Top of the list are: more frequent updates, HTML support (it's coming), binary distributions (just released), NNTP, and the addition of Solaris and Linux ports (which has now been done).

Less frequent but no less appreciated suggestions included: a better X11 programming environment, more WWW involvement, an IMAP-based mail system, a more robust figure editor, a file manager/desktop application, a drag and drop interface, audio support, a Ness tutorial, faster ports, security enhancements, more inset consistency, widget consistency, overall simplification, Motif aesthetics, and the addition of build and port services.

And that was just a short list of the many ideas we were able to glean from your responses. A hearty thanks go out to those who participated in this year's survey.

News Feature

Assistant Director at Work In September, AnnMarie Zanger joined the Consortium in the role of Assistant Director. Her duties include promoting our activities and services, improving member relations and handling office operations. AnnMarie comes to us from New York city where she worked in both the publishing and finance industries. She and her husband, Yasi, have now both moved into the academic world: he works at the University of Pittsburgh while she is learning the ropes at CMU. During their free time, they enjoy working on the house they recently purchased in Pittsburgh.

By the way, AnnMarie is yours truly! I double as your newsletter editor and I look forward to working with you. I encourage you to contact me with your comments on how the Consortium is doing and how we might improve our services. You will find me at:

Email: az28@andrew.cmu.edu Phone: (412) 268-6789 Fax: (412) 268-5571

Facts on File

Andrew Is...

Compound Document Architecture...Word Processor...Drawing Editor...Mail /Bulletin Board Reader, Writer, Manager...Spreadsheet / Table Editor...Widget Set...Application Builder...Scriptable...In C and C++...For X11

...With a consistent, integrated user interface so you can create compound documents containing pictures, words, tables, graphs and more.

The *Andrew User Interface System (Andrew)* is a word processor for compound documents, a collection of related applications, and an environment for building new applications and embeddable objects. Andrew runs under X11 and provides a dynamically-loadable object-oriented environment wherein objects can be embedded in one-another. Thus documents can contain not only multiple fonts and other typography, but also embedded raster images, spreadsheets, drawings, equations, simple animations, and so on. These embedded objects may themselves contain other objects, including text. The release includes many objects, including those mentioned above, along with a help browser, a directory browser, a font editor, a system monitoring tool, an editor-based shell interface, and source-text editors for C, C++, Lisp, HTML, Pascal, and other languages.

The underlying *Andrew Toolkit architecture (ATK)* supports cooperation between objects not only for screen display, but also for file storage, cut/paste across windows, an application construction environment, an extension language, and printing. There is full support for programmers to create new objects and new applications.

The *Andrew Message System (AMS)*, a component of Andrew, provides a multi-media interface to mail and bulletin-boards. AMS contains many advanced features including authentication, return receipts, automatic sorting of mail, vote collection and tabulation, enclosures, audit trails of related messages, and subscription management. It also provides a variety of interfaces that support character-based terminals and low-function personal computers in addition to high-function workstations.

Andrew-Ready Platforms

Andrew has been used successfully on (at least) these platforms:

IBM---RT AOS 3.4, RT AIX 2.2.1, RS/6000 AIX3.1, PS/2 AIX1.2
SUN---Sun3 3.5, Sun3 4.0, Sun4 4.0, Sun3 4.1, Sun4 4.1, Sun4Mach, Solaris
DEC---Vax Ultrix 3.1, Vax Ultrix 4.2, Vax BSD, DEC MIPS, Pmax Mach
Other---HP, SCO I386, SGI IRIX 4.0, Apollo, Macintosh II, MacMach, 486 Mach, Telmat, Linux

Remote Demo Service

Try out Andrew from your own work station via the Remote Andrew Demo Service. You will need a host machine on the Internet running the X11 window system. You will be able to compose multimedia documents, navigate through the interactive Andrew Tour, and use the Andrew Message System to browse through a few of CMU's four thousand bulletin boards and newsgroups.

To get started, simply run the following command on your machine: finger @atk.itc.cmu.edu (128.2.203.218). The remote demo system will give you further instructions.

Accessing the Source Code and Binaries

Sources and binaries are available online via anonymous ftp from: ftp.andrew.cmu.edu (IP: 128.2.232.154) in pub/AUIS/. See the README file.

Other ftp sites are: ftp.x.org (IP: 192.112.44.100) and its clone sites (see pub/R6untarred/contrib/lib/auis-6.3). On the nationwide AFS file system, Andrew is available in: /afs/cs.cmu.edu/project/atk-ftp.

Binary distribution packages for subsets or all of Andrew are available for the following system types:

RS/6000
Sun 4C Sparcstation
HP 720
DEC Pmax
Linux

Source and binary tapes are also available by mail (see "Services and Offerings-Andrew on Tape" below).

Membership in the Andrew Consortium

The School of Computer Science at Carnegie Mellon University has established the Andrew Consortium to maintain and enhance the Andrew User Interface System (Andrew).

The Consortium offers outside organizations the opportunity to help shape the future of the system. Participate in the development of Andrew, utilize the latest advances by our technical staff, and undertake commercial exploitation with the active cooperation of the developers.

The overall efforts of the Consortium staff are directed toward:

+ increased quality in existing media,
+ enhancements, including a direct manipulation interface builder,
+ embedding of applications such as generic X applications,
+ increased potential for transition from Andrew to successor systems
+ interoperability with standards such as Posix, Motif, C++, OLE, and SGML.

The Consortium makes its most up-to-date release, currently Andrew 7 in C++, available only to members. The current publicly available Andrew release is 6.3, released via anonymous file transfer over the internet.

Membership in the Consortium is offered to organizations interested in exploiting Andrew technology within their operations or products. All members support the consortium as it:

+ Enhances, maintains, and distributes the Andrew software base.
+ Conducts an annual meeting to review progress and set priorities.
+ Distributes a quarterly newsletter
+ Monitors the info-andrew mailing list.

We offer memberships at three levels: Full, Contributing and Associate. You are cordially invited to join us. Please contact our Director, Fred Hansen <wjh@andrew.cmu.edu> if you would like to discuss the opportunities that the Consortium has to offer.

Consortium Services and Offerings

The following materials are provided by the Andrew Consortium at Carnegie Mellon University for internal educational use only and may not be reproduced for sale or distribution. Please mark your selections below:

ANDREW IN PRINT

_____ **The Andrew User Guide** US$25

This printed and bound guide, offers a comprehensive description of how to use Andrew applications and insets. Chapters cover ez, help, typescript, messages, console, raster, figure, table, and many other facets of the system. (130 pages)

_____ **Selected Technical Papers on Andrew** US$30

This set represents a selection of some of our most handy references on the Andrew system. (250 pages)

A Guide to Andrew (User Tutorial)
Ness: An Extension Language for the Andrew Toolkit
Programming with the Andrew Toolkit
ADEW: The Andrew Development Environment Workbench
Createinset: Generate Source Files for a New Inset
The Andrew Message System

_____ **Andrew Technical Conference Proceedings** US$20

The Andrew Consortium sponsors its own technical conference each year. This volume includes the entire proceedings of the 1994 event, (Application Developer's View of Andrew, The Web Browser, Compound Document Architectures) plus highlights from the 1992 and 1993 conferences. (85 pages)

_____ **Programming Documentation on Andrew** US$95

This package represents a complete set of programming documentation on the Andrew system, sold in hard copy form. (1250 pages)

ANDREW ON TAPE

_____ **Public Source Tape (6.3 in C)** US$150

Want the source code on tape? Here it is, ready to use on your Andrew-compatible platform.

_____ **Private Source Tape (7.2 in C++)**

______ US$350 for business use ____________________ Name of designated user/company

______ US$250 for personal use ____________________ Name of designated user

Purchase our most up-to-date version of the source in C++ and take advantage of the latest programming advances made by our technical staff. (This tape must be designated for the use of one individual only.)

_____ **Binary Distribution Package (6.3 in C)** US$100

This tape provides you with everything you need to get Andrew up and running on your RS/6000, Sun 4C Sparcstation, HP 720, DEC Pmax or Linux machine. Files include the source code, word processing, documentaton, and mail for MIME-compatible messages.

If you are ordering ANDREW ON TAPE, please specify format:

_____ 1/4" streaming tape (150 MB)
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_____ 8 mm HP Iotamat format

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Web: http://www.cs.cmu.edu:8001/afs/cs.cmu.edu/project/atk-ftp/web/andrew-home.html

Demo: finger @atk.itc.cmu.edu

Access: ftp.andrew.cmu.edu:pub/AUIS/