Picking up the Narrative Thread with MIT's Glorianna Davenport

Professor Glorianna Davenport's "interactive-cinema" lab at MIT's Media Laboratory is a multimedia bonanza: It has two editing rooms, a harvest of computers, including six Unix workstations, videodisc players and recorders, music equipment, slide projectors—the works.

Against the far wall is Elastic Charles, a multimedia electronic magazine. Built by students from the Massachusetts Institute of Technology in Cambridge as a class project, Elastic Charles has articles that combine video, text, slides and sound. Its stories include a feature on a river journey, and articles on people, recreation, history and the environment. Each story has a unique interface. The river journey, for example, has a map. Clicking on various locations calls up complementary movie sequences. What follows is an interview with professor Davenport.

BY SIMSON L. GARFINKEL

Glorianna Davenport: I'll give you a quote. A friend of mine's 12-year-old son spent an hour adventuring with *Elastic Charles*. Afterwards, he went over to his mother, and said, 'Glorianna should go national.' That excited me a lot, partially because it was a kid said it. There's a whole new generation of thinkers: It would be nice if video for them was a medium which they could tell stories with, as opposed to a medium in which somebody else tells them stories. I think that it is time for something national.

Q: *You are chartered to work on "interactive cinematics." What does that mean?*
GD: The term interactive cinematics represents what the new structure of movie-based multimedia needs to be. Typically with linear movies, editors put together a structured sequence of shots to build a story. When you get into interactivity, we are asking the machine to do a lot of the work that the editor has done in the past: Select a shot, maybe the shot should be named, and place that shot next to another shot to build an information sequence. But we would like movies to remain movies. We would like to enjoy the movie part of multimedia, despite the fact that the machine is orchestrating the sequence for us.

Q: *How does the approach that you are taking differ from that of commercial multimedia editing and presentation systems?*
GD: Most of the presentation systems assume that the author is the author and the viewer is somebody else, so that the viewer isn't very interactive. For the most part, they punch and click and do whatever the author has envisioned them doing. My notion is that the viewer should have the same tools that the author has, although the author might be at a more sophisticated level in using those tools. The viewers should be able to grab hold of the video, put in their own text annotation or make their own visual link.

Q: *What do you see the computer doing?*
GD: Take the example of an on-line news archive, like CNN or ABC, and a user who wants to get a summary of a story. The way I see that happening is not having the summary exist some place and getting it downloaded, but having the user ask some question and then a program on the remote side taking that question, going in, and [constructing a story]. The computer would decide if things are redundant and where two interviews might be important to show different sides of an issue. You might need a map. You might need some historical background or a set of segments over time.

Flexible narratives: MIT Media Laboratory professor Glorianna Davenport in front of the *Elastic Charles* project, a multilevel electronic magazine with interactive capabilities.

SIMSON L. GARFINKEL

These would then be loaded into a buffer on your side of the connection. You would still need a program that would give you a way to navigate within the story.

Q: *How close are you to actually doing that?*
GD: We are able to, from a very small news archive, pull out different stories that to normal viewers seem interesting. To me, it doesn't represent very much. We just haven't dealt with enough footage.

Q: *What you envi*
GD: I w not that stands t we need mation Right no and a C data.

New Animation Software Revives Old Techniques

BY LYNDA WEINMAN

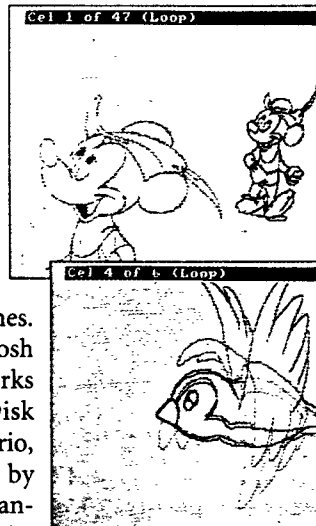PC and Mac-based animators who learned their craft on the computer may not be aware of techniques used for years by traditional animators. Character animators historically have worked on light tables, for the purpose of seeing multiple drawings. This method allows action to be plotted based on the first and last key frames of art—a technique known as "inbetweening." The end result is significantly more fluid and natural motion.

A number of animation programs now include an "onion-skin" function that uses the light-table metaphor. With these packages, an animator is able to create a new image or edit existing ones while at the same time viewing the before and after frames. Packages for the Macintosh include: Animation Works ($199.95) from Gold Disk Inc. of Mississauga, Ontario, and AddMotion ($295) by Motion Works Inc. of Vancouver, British Columbia. Disney Animation Studio by Walt Disney Computer Software Company Inc. of Burbank, Calif., is now available for the Amiga ($179.95), and a version for the IBM PC ($179.95) is expected to ship in late summer.

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Rotoscoping: Walt Disney Comput Animation Studio allows you to vi tions at once in order to do inbetw

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al viewers seem interesting. To me, it
ı't represent very much. We just
ı't dealt with enough footage.

Q: *What sort of commercial applications do
you envision for this technology?*
GD: I would like to see, and I think it's
not that far away, magazines on the news-
stands that are CD-ROMlike. To do this,
we need digital video to store the infor-
mation on a single-material something.
Right now, we use a 12-inch disc [for video]
and a CD-ROM to distribute the other
data.

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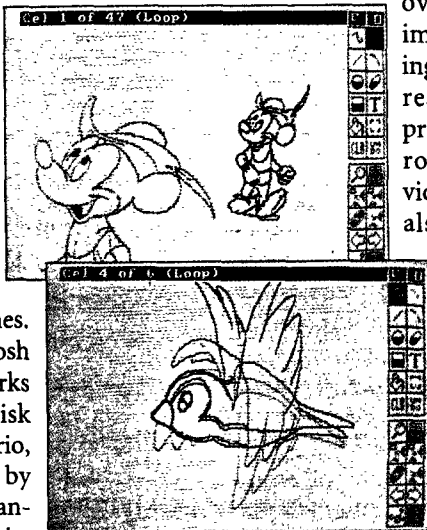ɪtɪonɑl ɑnimɑtion is ɾalled "rotoscop-

ing." This technique lets the artist trace an
existing image, while creating a new piece
of art based on the original. For example, an
animator could rotoscope live-action video
frames of a person bouncing a ball, then
replace the real ball with an imaginary
object along the path of motion and defy
the audience to figure out how it was done.

Oasis ($795) from Time Arts Inc. of
Santa Rosa, Calif., a Macintosh paint pro-
gram with many excellent features for ani-
mation purposes, contains a LightBox fea-
ture that functions as a rotoscoping tool.
For video users, it boasts an NTSC-safe, 24-
bit palette and allows video frame-grabs
from a NuVista board without leaving the
program. The user can open a 24-bit file or
frame-grab, then open a new file, position
that file over the first one and turn on the
LightBox feature. The first file is slightly
dimmed, as if tracing paper has been placed
over it while the user
implements Oasis' draw-
ing tools in the new file in
real time. In effect, the
program allows the user to
rotoscope an existing
video sequence. Time Arts
also publishes Lumena
($1,495-$3,995, de-
pending on graphics
board), a paint pack-
age for the IBM PC.

It is refreshing to see
software developers
responding to the needs
of traditionally trained
character animators.
Animators in the digi-
tal arena are sure to
benefit from the incor-
poration of these tech-
niques in animation software, enhancing
the wealth of animation styles already
available.□

**Rotoscoping: Walt Disney Computer Software's
Animation Studio allows you to view two posi-
tions at once in order to do inbetweening.**

*Independent animator Lynda Weinman is an advocate
for. and authority on, Mac-generated art and animation.*

Davenport *from previous page*

Q: *What's wrong with using two discs?*
GD: Nobody will ever buy it.

The other thing we need is format coher-
ence across platforms, so there is some
drive that reads whatever format that you
have recorded your magazine in, and it is
equally hookable onto a Mac, a PC or a
Unix-based machine. With what I have
seen, like CDI, the limitations are enor-
mous. You want to be able to get whatever
comes on the CD-ROM into your worksta-
tion, or maybe send aspects of it to some-
body else with electronic mail. You don't
want a totally closed system.

Q: *What are some of the technological prob-
lems you've encountered?*
GD: Currently, when video is shot, it has no
information attached to it—except maybe
SMPTE code. The person who knows the
most about what they are shooting is the
camera person. We have to invent some
sort of method where the camera person
can easily input information about who,
what and when onto the video itself, and
have that information stay with the video
for its lifetime. That way, the video could go
through several edits, but we would still
know that a particular shot was of Jerry
Weisner, or that a shot was taken at a con-
ference between Gorbachev and Bush.

Q: *What other commercial opportunities do
you see for this technology?*
GD: One big area is going to be interactive
narrative, [or] a multithreaded story. Typi-
cally, when we go to the movies, the story
has been written in such a way that there is
one thread, one plot and one set of charac-
ters who interact in a particular way, and
that's given to the viewer. It's kind of a gift
from the maker to the viewer.

Q: *And it's normally a male viewpoint?*
GD: And it's normally a male viewpoint,
although there are female directors these
days. I'm interested in building multi-
threaded narratives. This includes both
documentary and made-up stories. Usually
in life there is more than one set of charac-
ters interacting in any particular scenario,
and the outcomes may vary for the different
characters involved. We don't know even
how to write these stories, partly because
we don't have the tools to think about
where the intersections are. It is very diffi-
cult for us to develop five characters who
don't know each other into a plot that is

Davenport *from Page 15*

going to have an intersection at some point in time.

Q: *What do you see yourself ultimately doing? Do you want to get in on the content side of this industry?*
GD: I am on the content side. I will remain on the content side and, as soon as there are enough smart graduates from MIT to solve the technical side, it will be more fun. Right now, we have to simplify the content to put it in something that exists, but the whole point is to make the content.

Q: *What are the stumbling blocks?*
GD: The first one is our heads—imagining what the content is—and what's exciting. Another frustration is not doing enough of it. It takes a long time to think of a project, get students involved and make [it].

I would really like a publisher to come along and say, 'We are going to do *Travel and Leisure* electronically. You are going to make a format and once you have, we are going to do 12 issues without thinking.'

It's so idiosyncratic right now. Everything has its own interface. Each project is different. You [need] enough stuff going through so that you can say, 'This works,' and 'That works.' Take the on-line news archive. It would be really exciting to see what stories we could get the computer to come up with. We've never had enough footage on-line to allow us to do that.

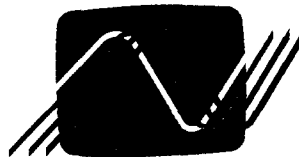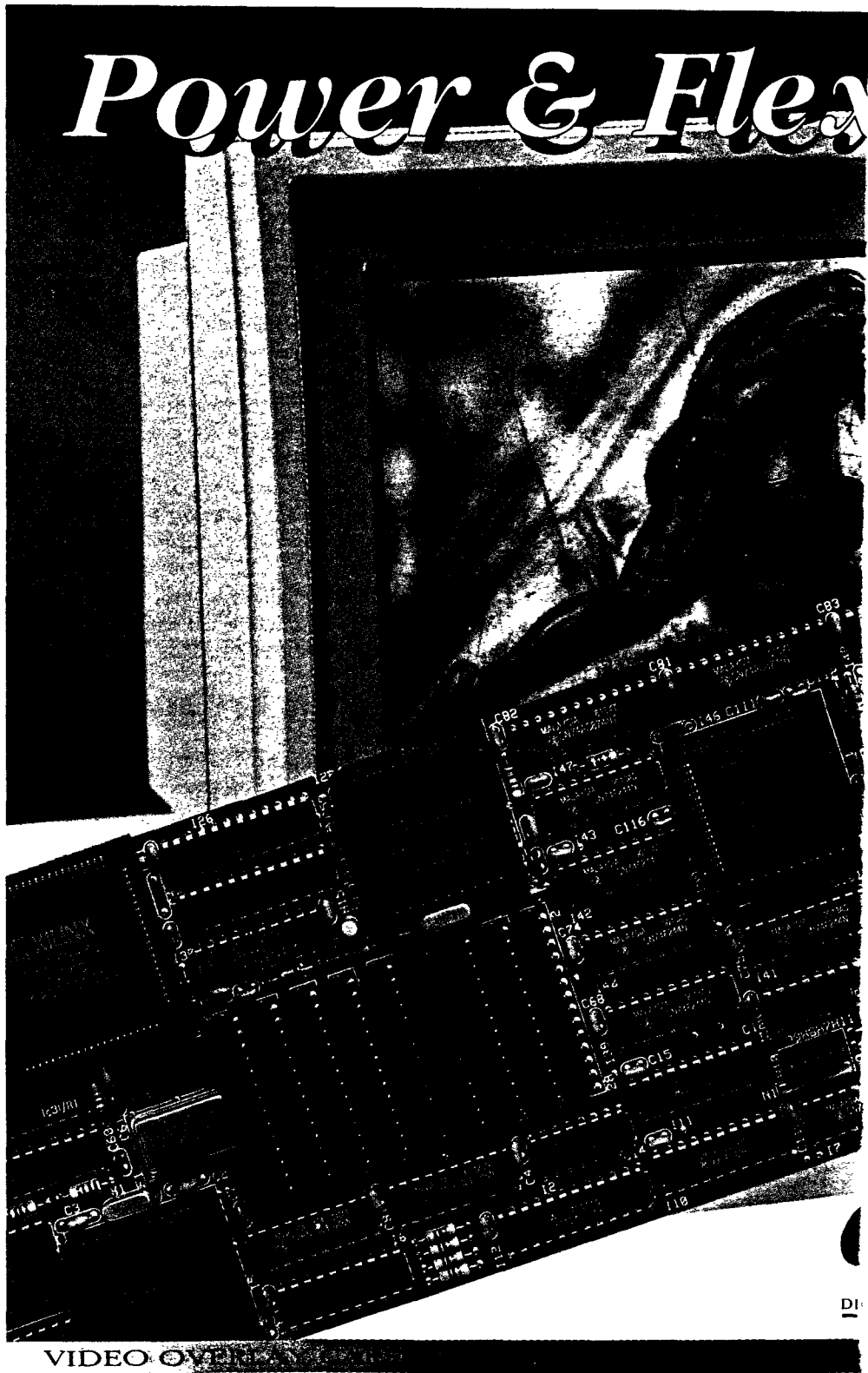**Q:** *How many hours of on-line video do you need for projects?*
GD: New Orleans is three hours. That's a case study I did of development along the riverfront, between 1983 and 1986. It's highly edited, but it can give you a really good picture of what went on there. I have this idea for a national science-and-technology journal that will use video and will ship the video over the net. You can build a data bank of interviews and each issue might have only 30 minutes of video.

Q: *What's the biggest problem with multimedia?*
GD: Multimedia is an awful term, but it is nationally acceptable, so we have to love it. Also, it is way too expensive. The problem is to get it cheaper, without sacrificing programmability. □

Simson L. Garfinkel is a free-lance science writer and computer consultant on leave from the Music and Cognition group at MIT's Media Laboratory.