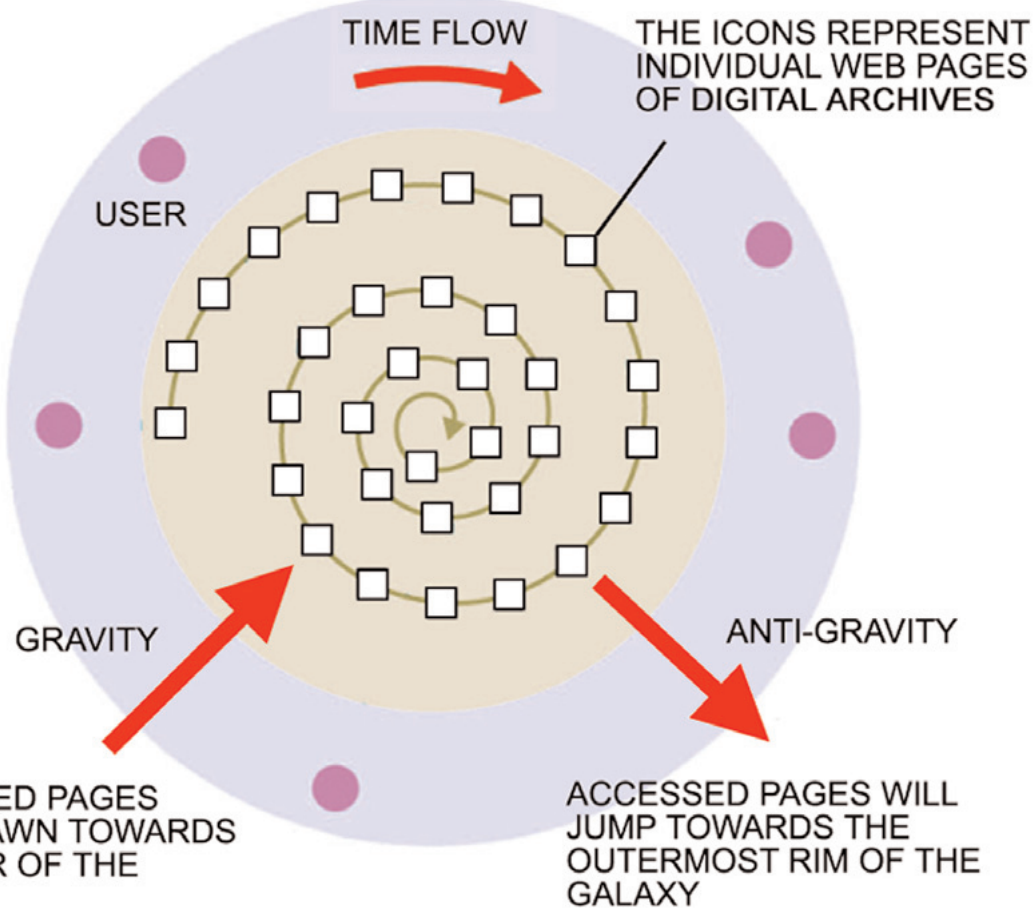


# COMPUTER GRAPHICS

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July 31-August 4, 2005*

<http://www.siggraph.org/s2005/>

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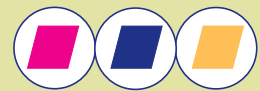
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## FROM THE EDITOR

### Please Contribute to *Computer Graphics*

*Patricia Galvis-Assmus*  
**Computer Graphics Editor**

In this issue, we have the inauguration of a new column! MEMBERS AT WORK will feature the daily work experiences of ACM SIGGRAPH members. We welcome the participation of Steve Pitzel as the first contributor to this column. Also in this issue - Akira Wakita and Fumio Matsumoto provide us with a view on information visualization on the Internet and approaches to using Web3D, an interview with Sol Sherr and other worthwhile reading. I would also like to personally thank Curtis Rueden, Kevin Eliceiri and John White for their contribution to the May issue in the VisFiles column.

The content of this quarterly is made possible by the contributions submitted by members of ACM SIGGRAPH. This means

YOU! Consider the fame! Consider the personal gratification! Consider the importance of sharing information with your colleagues and upcoming professionals. This is a vital aspect of our field. Sharing of our knowledge beyond the annual conference is of great importance, particularly to those who cannot attend yearly.

Future issues of *Computer Graphics* are slated to cover issues of educational opportunities, technical aspects vs. creative outlets, graphics software design, special effects and motion graphics. So...if you have an interest in these areas or have a penchant for a particular topic not mentioned above, please contact the editor at [patricia@siggraph.org](mailto:patricia@siggraph.org) with your ideas and proposals of submissions and contributions to the *Computer Graphics* quarterly. Thank you.

#### About the Editor



*Computer Graphics* Editor **Patricia Galvis-Assmus** is an Associate Professor in the Department of Art at the University of Massachusetts and the Director of the Center for Research in Art and Technology. With a background in computer animation and experimental film, Galvis-Assmus is currently doing research in motion capture.

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THE 32ND INTERNATIONAL CONFERENCE ON  
COMPUTER GRAPHICS AND INTERACTIVE TECHNIQUES

31 JULY - 4 AUGUST 2005  
LOS ANGELES, CALIFORNIA USA

### Call for Volunteers

SIGGRAPH 2005 is looking for volunteers who want to create, produce, and present the world's largest annual event in the computer graphics community. If you are capable, enthusiastic, and reliable, if you have the vision, expertise, and energy we need on the SIGGRAPH 2005 committee, please volunteer.

It's an experience you'll never forget. And it's a great opportunity for professional development, personal growth, and making new connections in the SIGGRAPH community.

The SIGGRAPH 2005 Committee will be responsible for planning, jury and content selection, and production of the many SIGGRAPH conference programs. These program-chair positions include: Papers, Panels, Courses, Educators Program, Web Graphics, and Sketches; installation programs such as Emerging Technologies, Art Gallery, and the Computer Animation Festival; and support positions such as International Resources, Community Outreach, and Student Volunteers. The Program Chairs work closely with the Conference Chair and a variety of contractors to create an innovative and informative conference.

Volunteer opportunities are also available in program subcommittees and support groups that work primarily during the conference.

We are looking for people who are willing and available to devote significant time, travel, and effort over an 18-month period. Volunteers for these positions must have vision, effective communications skills, and the desire to be part of a complex, interdisciplinary team.

SIGGRAPH 2005 will be held in Los Angeles, 31 July - 4 August 2005. For complete information on conference volunteer opportunities see: [www.siggraph.org/volunteering/](http://www.siggraph.org/volunteering/)

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THE 33RD INTERNATIONAL CONFERENCE ON  
COMPUTER GRAPHICS AND INTERACTIVE TECHNIQUES

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SIGGRAPH invites nominations for SIGGRAPH 2006 Conference Chair. The annual conference is the premier annual international event for researchers, developers, creators, educators, and practitioners in computer graphics and interactive techniques. The Conference Chair leads and inspires a highly energized, multi-talented, and deeply committed team of volunteers and professional service contractors to create, plan, and produce every aspect of the conference.

The Conference Chair works closely with the SIGGRAPH Chief Staff Executive, the Conference Advisory Group, the contractors, and the volunteer program chairs, over a three-year period, from early 2004 through 2007. In addition to managing the conference, the 2006 Conference Chair will also serve in an advisory capacity to the SIGGRAPH organization during those years.

For a detailed job description and information on how to apply, please see: [www.siggraph.org/volunteering/](http://www.siggraph.org/volunteering/)

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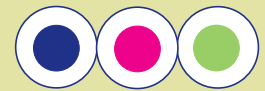
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# COMPUTER GRAPHICS PIONEERS

## Focus on...Sol Sherr

Sol Sherr (a genuine CG Pioneer) and I have been friends for four decades. I recently had a chance to chat with him about the “early days” and this transcription of our conversation makes a first rate column. He is reachable by email at [ssherr@taconic.net](mailto:ssherr@taconic.net).

— Carl Machover

*Carl Machover (CM) interviews Sol Sherr (SS) at his home in Old Chatham, NY on May 4, 2003.*

**CM:** Sol, tell me a little bit about the first time you became involved with graphics. When was that?

**SS:** It must be way back in the 1980s. I was working for Western Electric and I got involved in a variety of programs that included some type of a display system. That was my first introduction to the field. Before that I worked more in the general field of electronics, with displays as one incidental part, but that's when I began to specialize more in visual output.

**CM:** What was the nature of displays at that time? What kind of things were they?

**SS:** They were primarily CRT type of displays, not anything like flat panels that we're involved with. A great variety of CRTs were involved, including specialized types such as those that had built-in memories in the screen that allowed you to get more data on the screen.

**CM:** By memories, do you mean storage tube-type things?

**SS:** Somewhat like storage tube-types, yes that's right. And I know that we worked with that to a considerable extent, though they were not terribly successful. It was the only way that you could get long-term memory available visually.

**CM:** What were the applications for the ones you worked with?

**SS:** Those were mostly for radar.

**CM:** And were they at that time annotated?

**SS:** Oh yes, the screen was primarily alphanumeric. There weren't a variety of visual images at that time. It was just the straightforward alphanumeric presentation of data information.

**CM:** Alongside of some kind of radar target?

**SS:** Yes and no. Sometimes alongside a radar target and sometimes if the target's changed in some way to fit in with the images and how they were presented.

**CM:** Were these vector displays or raster displays?

**SS:** They were vector displays, primarily.

**CM:** And who was the customer?

**SS:** The end customer was the government.

**CM:** What kinds of applications were they?

**SS:** I think there were some airborne systems and shipboard systems, primarily, but not much for the Signal Corp., which I can remember.

**CM:** What is your recollection about the principal differences between the kinds of systems you were working with then and what is available today?

**SS:** The difference, of course, is the technological changes in the method of presenting information. CRTs became much more rapid in their response and were able to use raster types of presentations so that what was on the screen could be far more involved than it was with the older systems that we started out with during WWII. That continued for

quite a while, and the big changes had to do with using raster system presentations instead of linear, as an example, where the image was in many ways more involved and more interesting to look at.

**CM:** Did the systems that you worked with have means for interactivity? Did the operator interact with the displays?

**SS:** In general, yes. There was some interactivity. Even initially there was at least a certain amount of interactivity.

**CM:** What were the interactive devices that were available to you early on?

**SS:** Well, early on, there were of course many relatively simple ones, like keyboards.

**CM:** Were these light pens or ... ?

**SS:** Light pens are one that became very common.

**CM:** How about color; was that part of the environment?

**SS:** Again, that was not available initially, but color displays became more available within the last 20 years at least. Prior to that we dealt primarily, if not totally, with single color units, whatever the CRT might make available in that single color. Now, of course, color displays are the prominent ones, we don't have any non-color displays any more, even when it's not CRT type, since all of the flat panel techniques now allow you to generate color.

**CM:** What's your recollection of the kind of costs that were involved early on? What did a system cost compared to what similar capability would cost today?

**SS:** I can think of something as straightforward as television, where if you wanted to get a unit which had a reasonable resolution,

as in the 500-line systems that we work with now and that you could pay \$1,000 and more with a reasonably good CRT and this has gone down enormously so that you can get an even higher resolution in the neighborhood of just maybe a few hundred dollars at the most. So the cost has been enormously reduced. That's one of the factors, I believe, that's keeping the true flat panel displays from taking over the whole presentation system, because the CRT has reached a point where it's a relatively inexpensive way of achieving that kind of presentation, with good quality. But it might change in the next few years. We'll have more of the new type of technologies taking over at lower price. You look now and, if you want to get a plasma type of display with high definition input, you see that you're paying \$6,000 for it just as a normal type of product, not even one that you're building for the government or the military. That's still high priced, and you can buy the CRT equivalent, with much better quality for under \$600. That makes a big difference. When that change will occur I don't know. I used to think that would happen much sooner, but it's going on now for a number of years with no appreciable change in the costs of the higher technology capability systems.

**CM:** How much life do you think is left in the CRT?

**SS:** Well, I used to think not too long ago that it was reaching the end of its life, but now I would say it's good for another five years, as a guess, and then I think that the price of flat panels will go down sufficiently that it will affect not only commercial units, but the whole system type of use for government, military, commercial and general consumer markets, and we'll have nothing but flat panel displays, liquid crystal, plasma or whatever the future might bring.

**CM:** Do you remember when you first saw the use of this technology in entertainment applications as opposed to military and government stuff?

**SS:** It certainly started at the time when it was possible to make color systems. The color systems had a big impact on moving away from purely military or commercial applications.

**CM:** You were involved in one of the early information display organizations. What do you remember about the beginnings of SID?

**SS:** SID, as I remember, started on the West Coast, where a meeting was held of a small group of individuals interested in forming an organization that concentrated on system

displays, and that was in 1962. There was this one meeting on the West Coast of a group of maybe 30, 40 people, I believe, but I was not directly involved in that one, and they formed this organization to concentrate on display technology in general and display systems in general. I got involved in it in the following year when there was an attempt to expand the number of groups that were available and also to expand primarily the meetings of people who had this as a general interest. At that time there was not much of a range that you could deal with, so it had limited appeal, but what I did was in association with the early West Coast group.

**CM:** Who were some of the people in the early group?

**SS:** Rudy Kuehn and Hal Luxemburg were two of the first ones I got involved with.

**CM:** How did you get involved, if it was meeting out on the West Coast and you lived on the East Coast? What was the mechanism for bringing ...

**SS:** The mechanism was mostly by telephone for example and other means of communications. As I recall, I came across some articles like that describing what was going on and I had just begun getting involved in display systems at that time. Of course, this was very interesting to me, so I got in touch with three or four people who were involved then, who described the method they were using and they were trying to expand it and have chapters wherever they could get chapters formed. I took over then to do what was necessary in the New York area, or we called Mid-Atlantic at the time, but it was probably only in the NY, Manhattan and NJ areas. So, I formed this group in association with people I had gotten to know and I knew were involved to some extent with the field. I don't remember exactly, maybe a dozen or two dozen, but it wasn't very many that got that involved. So we formed it and I was the chairman and we elected a vice chairman, and you know, we had a regular organization going there. If I'm not mistaken, Carl Machover was associated with it at the time, too. So, that's how we began, our very limited activity, which has grown quite a bit since then, but we were one of the earliest ones — the first of the groups that were not in the West Coast alone. And the West Coast group didn't grow any faster, actually, than we did.

**CM:** Do you remember at that stage to what degree there was foreign participation? Were the Japanese as critical then to its success or was ...

**SS:** I believe they were. In fact, at that point they were ahead of us or at least they were certainly carrying on that way and they very rapidly began to take over the whole market. Initially, most of the work that I can remember going on there started in the U.S. in a few small companies and some larger ones of which Hazeltine was one example.

**CM:** Weren't you with Hazeltine?

**SS:** I was with Hazeltine. Hazeltine, to the extent that there was a display kind of business that could be carried on by it, was one of the most active. That's right. I spent a number of years there and they did concentrate a lot on raster systems. They were one of the first companies that made raster systems more available.

**CM:** Let me ask you a question. It seems so obvious that raster ought to be the thing to use, because of the data density without flicker. What took it so long to catch on?

**SS:** It was a problem of bandwidth, because raster systems require a certain bandwidth, because of the scanning time that was involved and in order to get large amounts of data down it was simpler to do it with the non-raster system, where you merely had to move the picture on the screen small distances over different surfaces.

**CM:** That we now call vector or directed beam?

**SS:** Yeah, directed beam was the term. Vector, of course, was a more common term and vector systems were able to be a lot more capable of putting a lot of information in varying forms on the screen within the limitations of response time in the display units themselves, among others. Of course, when TV became more capable of rapid response, where you had the, I guess the whole screen; the screens were just improved enormously. I'm trying to remember just what happened, but you were capable of putting on a CRT screen even as much as a thousand lines at that time and as TV became more and more of an important feature in the country or in the world, the raster systems became a lot more capable of information, so that instead of using the line-lighting systems the raster system began to take over at that time. That would be about the time, I guess, that I was at Hazeltine, in the sixties.

**CM:** What do you think has been the issue, that one of the reasons the raster systems were slow in coming was that the cost of memory was very high, that it took more display memory for a raster system than it

did for a vector system? Do you have a different perception of that?

**SS:** Memory costs, as you say, were very high, certainly compared to now. I'd have to give that some thought. It doesn't come to my mind immediately what the situation was.

**CM:** You were one of the early authors of books in this field.

**SS:** That's right, I was one of the first few ...

**CM:** How'd that happen? What brought you to it?

**SS:** At that time, there were several books that came out. Rudy Kuehn got involved in one and so forth. They were general introductions to display systems, in general, as I say. I'm trying to remember how I got involved, but the only thing I can recall, is that when I was working at Western Electric, at the time, and I was working on radar systems (that was one of the places where I started) and there was another fellow there working with me in my group that wrote a book. I don't remember exactly how it happened, but he got me interested in doing something to write for people who were interested in display systems the same thing that his book did for whatever his topic was. I'd have to look it up to remember what it was at the time. So I got started on this and I had written a few articles before that that were just published in the general press, you know, technical press. So I wasn't without a little bit of experience, but not anything of any great size. But it was something that interests me a lot because I was very interested in display systems and technology.

**CM:** What was the ... topic, remember the name of the first book?

**SS:** *Fundamentals of Display System Design* (©1970).

**CM:** Were they primarily addressing the engineering issues of making display systems?

**SS:** That's right, that's exactly what it was. The first one I wrote was as technical as I could make it from my understanding of the systems. The mathematics, the analysis and everything else that goes with it.

**CM:** How much of that did you have to develop or how much were you able to find in the literature and bring it together?

**SS:** I think a lot of it was in the literature and I gathered it up from the literature and applied that to the problems that I understood existed and tried to explain how one can do the design operations using that sort of approach. A reasonable amount of mathematics and detail of that sort was in that first book.

**CM:** What was your academic training?

**SS:** It was initially at the Julliard School, the part of it called the Institute of Musical Art. It goes a long ways back. And I did graduate from there, but it was at the depths of the Depression (that's the real Depression, not the one that we talk about now).

**CM:** The one in the 1930s?

**SS:** I graduated 1939 and there was nothing available, no jobs, nothing at all, so I had to find some other way to maintain my future wife and myself. I decided I had to go into some kind of technological situation where I might be able to find some kind of work. That was not too long before the actual war broke out, then there were more opportunities available. So I took advantage of one of them. It offered, at no cost essentially, education in technological systems of various kinds and I took one that led to being able to pass an examination for a particular technical license. I went through that course for about six months. This was after I had the degree from Julliard, and I did have some educational background from City College before that. I got this license and was able, because then the United States had entered the war, to get a job with Western Electric Company, first as an electronic tester and then as an engineer. That's where my engineering activities started, where I got involved in electronics radar, not displays as such at the time, though it was one part of the system. From that I went on to all these other technologies that I got involved in and did reasonably well, I guess, with it, one way or another. Now I'm back to music, finally. Live long enough and anything can happen.

**CM:** Anything else you'd like to add?

**SS:** It's been a long life and a varied one, with many interesting things. I certainly enjoyed working with many people, of whom Carl Machover is one of the best and now I can return to my first love, which I retained through all the years, and devote more time to it. I may keep in touch without doing anything. My activities are quite limited now.

**CM:** You use a computer?

**SS:** I do use a computer extensively, both as a toy and a source of information.

**CM:** To what extent do you stay in contact with the display community?

**SS:** Very little now. Initially, when I first limited my activities after the last book that I wrote in 1998, I still had some contact. I would say, in the last several years I've had just about ... none.

**CM:** Well, thank you. I really enjoyed this time. It was a lot of fun!

**SS:** Thanks for spending this time with me!

## About the Columnist



**Carl Machover** is President of Machover Associates Corporation, a consultancy providing services to computer graphics users, suppliers and investors. He has been interested and involved in the field of CG for many years, written numerous articles and conducted a number of seminars. Machover is Editor of the *CAD/CAM Handbook* (McGraw Hill, 1996) and serves on the editorial board of several publications.

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# PUBLIC POLICY

## Changes in the ACM SIGGRAPH Public Policy Program

*Bob Ellis*

ACM SIGGRAPH has an excellent tradition of volunteers not doing the same job for too long. Elected positions have term limits and most appointed and committee positions have a healthy volunteer turnover. I've chaired the Public Policy Program since its beginning about seven years ago and it's time for a change.

We've been looking for someone to take over the position, perhaps starting out as co-chair, for a couple of years. As of this writing (April 2003), we haven't found anyone. I'm disappointed, but not surprised. There are two difficulties: most people are not in a position where technology policy activities are a help in their career and there's considerable specialized knowledge that's required. Therefore, I plan to resign as Chair of the ACM SIGGRAPH Public Policy Program at the time of the conference in San Diego.

However, I do not plan to abandon my interest and activities in technology policy entirely. I will continue as a member of ACM's US Policy Committee (USACM) and perhaps even make more contributions

there. USACM has the advantage of having a staffed Washington office.

There is also the workload; it's beginning to interfere with my retirement! When we started having events at the conference, the amount of work increased significantly. I also significantly underestimated the reading required. In November 2001, I started an electronic bibliography of the technology policy articles I've read. Currently there are more than 2,000 entries, although there is some duplication because I frequently file an article in more than one place. This is an average of at least 3 per day, 7 days a week, 52 weeks a year! Add in the job of the quarterly column, watching over the website, maintaining the bibliography, organizing a BOF and my USACM work it has become a big job.

I've had some great help from Myles Losch, Laurie Reinhart and David Richard Nelson. Plus the guidance of folks like Jim Foley, Oscar Garcia, Mike McGrath, Mike Zyda, Judy Brown, Steve Cunningham and all the contributors to the column, panel and courses.

### About the Columnist



**Bob Ellis** is Chair of the ACM SIGGRAPH Public Policy Program. When last gainfully employed (1993), he was Sun Microsystems' representative on the Computer Systems Policy Project's (CSPP) Technology Committee and also co-managed Sun's external research program. Before that, Ellis held computer graphics software development and management positions with Sun, GE-Calma, Atari, Boeing and Washington University (St. Louis).

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