First NCGA conference focuses on productivity

With the theme "Progress and Productivity through Computer Graphics," the National Computer Graphics Association held its inaugural conference June 16-19 in Arlington, Virginia. Over 1700 users from the US and ten other countries attended the program of tutorials, sessions, and exhibits.

At the conference, Caby Smith of the National Park Service was elected NCGA president for 1980-81, succeeding Stephen R. Levine. Smith, in reporting a membership of 1200 after 11 months of operation, cited the increasing interest of business and government—especially the federal government—as the major factor in NCGA's growth.

NCGA is planning its second annual conference for June 15-18, 1981, at the Baltimore Convention Center.

COMPCON Spring 81 will take closer look at VLSI's impact on life in the future

Since all aspects of life in the future will be profoundly affected by VLSI, COMPCON Spring 81 will take a comprehensive look at the role this new technology will have in the laboratory, office, factory, and home.

No longer a curiosity of the semiconductor industry, VLSI is now applicable throughout the marketplace, stated James Rudolph, program committee chairman for the Computer Society's 22nd International Conference, to be held February 23-26 in San Francisco, California.

Because of VLSI, computer applications are on the verge of expanding dramatically into a much larger portion of our society, elaborated Ted Laliotis, COMPCON general chairman. No longer confined to the realm of scientific and engineering laboratories, computers have penetrated into other areas and will become vital to offices, factories, hospitals, and homes in the future.

As a result of COMPCON Spring 81, electronic professionals will understand how fast the transition from earlier technologies to VLSI is occurring. "VLSI solutions and lower cost parallel each other," Rudolph noted. "The challenge that everyone will face is—how do you implement VLSI? That's what this COMPCON is all about."

With 15 years in the computer research environment, Ted Laliotis is presently department manager of Hewlett-Packard's Computer Research Laboratory. Earlier, he held research and development positions at IBM, Fairchild, and ASI, Inc. An active member of the IEEE Computer Society, Laliotis is the founder/chairman of the Asilomar microprocessor workshop.

With experience in computers, communications, and microelectronics, James Rudolph is president of Gnostic Concepts, Inc., a consulting firm. He has previously held technical positions with Bell Laboratories, Hewlett-Packard, and Rockwell International.

Other members of the COMPCON Program Committee are Dennis Allison, Stanford; Frank Clegg, Hewlett-Packard; Alvin Despain, University of California, Berkeley; Herb Hellerman, Amdahl; Y. Honda, Fujitsu; Gary Kildall, Digital Research; Stan Mazor, Intel; Dave Patterson, University of California, Berkeley; Peter Schneider, Siemens; Carlo Séquin, University of California, Berkeley; Peter Verhofstadt, Fairchild; John Wakerly, Stanford; Jim Warren, Datacast; and John Zasio, Microtechnology.

For more information about the conference, contact COMPCON Spring 81, PO Box 639, Silver Spring, MD 20901.
Siggraph '80 emphasizes importance of graphic design

Ware Myers
Contributing editor

The Roman alphabet we still use was developed in an age in which a block of stone was the medium, Mervyn Kurlansky of Pentagram Design, London, told the opening session of Siggraph '80 in Seattle July 16. The shape of the characters was influenced by the nature of this first medium. Today, as we try to form Roman characters on computer generated raster-scan displays, we find that their shapes are unsuited to the technical requirements of the medium. On the raster screen, letter segments are defined by small, discrete picture elements, not with chisel strokes. As a result, lines at other than horizontal or vertical orientations have a jagged look and reproduce poorly.

In the world of graphic design, multitudes of type styles have evolved out of the basic Roman alphabet. Not only are most of these type fonts highly readable, but many of them carry an additional message at the subconscious level. By skillful selection of the appropriate type face, an advertising artist, for example, can tell the reader something about the quality of the product. On a more mundane level, we are accustomed to judging the relative importance of different parts of a printed text by the type size and weight, and to sensing emphasis from devices such as italic type. Hence, graphic design offers a rich repertoire of visual cues beyond the literal meaning of alphabetic characters.

Other speakers at the opening session, Susan Marcus and Jack and Gay Reineck, showed how information can be conveyed to the user more effectively when the basic principles of graphic design are employed. The session was organized by Aaron Marcus of Lawrence Berkeley Laboratory. The graphic design session continued the efforts of Siggraph to expose the computer graphics community to related fields, an effort initiated in 1979 with three invited papers on the human visual system.

Conference attendance. With 2345 conference registrants and 3421 exhibit guests (for a total of 5766), Siggraph '80, cochaired by Harvey Z. Kriloff and Robert A. Ellis, continued the growth pattern of its predecessors. In addition, this year's schedule of eight tutorials attracted 1292 participants.

In a reception on the evening of July 15, the IEEE Computer Society introduced its new quarterly, IEEE Computer Graphics and Applications, to conference attendees. Edited by Michael J. Wozny of Rensselaer Polytechnic Institute, this publication is scheduled for a January 1981 start date.

Better quality graphics. Practical, cost-effective solutions to the poor quality of small-scale raster-scan characters are promised by the work reported in several conference papers. Texas Instruments' William J. Leler calculates that almost 3600 lines of TV resolution would be required to solve the problems of stair-stepping, crawling, line breakup, and scintillation, if higher resolution were used as the sole solution. At 3600 lines, he reports, the spot size becomes smaller than the human eye can resolve. (The commercial TV standard in the US is 525 lines.) However, a CRT monitor with 3600-line resolution is not feasible—it would have to generate each pixel in about two nanoseconds and use about 800 16K memory chips in its frame buffer.

Fortunately, there is another approach—the use of gray-scale pixel differentiation. With a point source, i.e., a source whose size is below the limit of resolution of the human visual system, brightness and size are interchangeable. Consequently, a feature smaller than a single pixel can be successfully represented by a brightness (or gray level) corresponding to its size. For example, a half-pixel size feature would be represented by a gray level at the middle of the gray scale.

If we employ 64 gray levels, requiring six data bits for each pixel, the first of these levels corresponds to a size of 1/64 of the pixel's area, i.e., a little square of 1/8 pixel-side by 1/8 pixel-side. In effect, the resolution is improved by a factor of eight. In other words, a 512-line display acts like a 4096-line unit.

John E. Warnock at Xerox Palo Alto Research Center has applied this approach to character display. He showed a number of lines of type composed with different values of the variables he employed, and there is no question that his gray-scale characters are much superior to plain black and white characters. Use of gray scale improves the legibility of the characters even at relatively small dot-matrix sizes. Characters of only six-pixel-height can be recognized, for example, though with some difficulty. At seven pixels and more, the font style becomes apparent. At 10 pixels even the serifs are apparent. At 11 and 12 pixels the quality is very high. Even fonts of less than six pixels in height can be used to compare page layouts, though individual characters are no longer recognizable.

Warnock found empirically that three bits of gray scale (eight levels) were adequate; four bits are slightly better. In addition, the technique permits characters to be rotated from the normal horizontal position without loss of legibility.


Siggraph '80 ribbon-cutting ceremony in the Exhibition Hall at Seattle's Convention Center, Tuesday, July 15. From left, General Cochairmen Harvey Z. Kriloff and Robert A. Ellis of Boeing Computer Services, ACM Siggraph Chairman James E. George of Mesa Graphics, ACM Executive Director Sidney Weinstein, and Siggraph '80 Exposition Chairman David J. Kasik of Boeing Computer Services.
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Japan's chip industry no more subsidized than US's, says Fujitsu executive

"Japanese industry will be neither labor-intensive nor capital-intensive, but brain-intensive," Shoichi Akazawa, executive vice-president of Fujitsu Limited, said June 25 during a keynote address at the World Computing Services Industry Congress II in San Francisco.

In a speech entitled "Japan Faces the 80's," Akazawa said that Japan's primary goal must be to make Japan into a technology-based society. "Development of high-technology industries will enable our country to take advantage of one of its greatest assets: the intelligence, discipline, and talents of its people. Conversely, it will help us to escape from the import-export vise in which we now find ourselves. And it will relieve us of one of our present difficulties, which is that Japan has become a country of high-cost labor."

Akazawa said that Japan already has started in this direction, especially in the computer industry. Although he noted that many Japanese computer manufacturers started by establishing technical relationships with IBM, Univac, GE, RCA, and others, he also pointed out that today not one Japanese computer manufacturer relies on foreign technology.

The speaker recognized that Japan's success in the electronics and computer fields was often criticized by US manufacturers. "Yes, our industry is subsidized—and so is yours," he countered. "The US semiconductor industry is by far the world's strongest. It holds over two-thirds of the world's IC market. It gained this preeminence through Defense Department subsidies."

Japan does have the largest share of the US market for one product, the 16K RAM, Akazawa noted. He attributed this to the American semiconductor industry's failure to anticipate the demand for the 16K chip and its subsequent inability to meet that demand.

The keynote declared that another reason for the success of Japanese devices in the electronics marketplace is their consistent quality. "Our high quality is no accident. Everyone in our company, from the president and CEO down to the porters and watchmen, regards quality as a personal obligation and does everything in his power to see that it is maintained at the highest level."

He also cited Japan's management practices as a reason for increased pro-
ductivity. Most Japanese companies use a "two-way system," Akazawa remarked, where opinions, suggestions, and ideas are welcomed from everyone in the company and not just from top management. "The Japanese style of management produces a consensus, and since everyone participated in reaching the consensus, everyone feels comfortable with it."

Microprocessor standards committee meets

The Computer Society's Microprocessor Standards Committee will meet at 6:30 p.m. on September 11, 1980, in the Faculty Club of Stanford University. Dinner reservations must be made in advance.

During the meeting, the subcommittee chairman will report on progress in their areas, including assembly language mnemonics standards, the backplane bus standard, the floating-point standard, the system bus standard, and the S-100 backplane bus standard.

For more information, contact Michael Smolin or Steven Diamond at Synertek, PO Box 552, Mail Stop 34, Santa Clara, CA 95052; (408) 988-5614.

Addendum re: multiprocessing

An acknowledgment was inadvertently omitted from M. Satyanarayanan's "Commercial Multiprocessing Systems" (May 1980). The following should have appeared at the conclusion of the article:

"This work was begun at IBM Yorktown Heights and completed at Carnegie-Mellon University. The author thanks Wayne Wilson and Mort Ginsburg of IBM and Rick Snodgrass and Jon Rosenberg of CMU for their comments and suggestions for improving the article."

Erratum—July issue

In Ware Myers' "Computer Graphics: A Two-Way Street" (pages 49-58), the images reproduced on pages 55-56 were drawn from the Siggraph '79 slide collection, which was issued as part of ACM Computer Graphics, Vol. 13, No. 4.

The affiliations of James E. George and Stephen R. Levine were incorrectly stated in the acknowledgments: George is chairman of ACM Siggraph and Levine is the fiche, shaded, and color graphics editor for Computer Graphics.

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