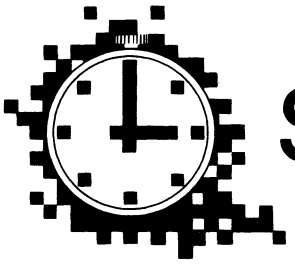

SELECTIVE UPDATE

NATO Advanced Study Institute stages first computer graphics event

The first NATO Advanced Study Institute (ASI) on computer graphics will be held from March 30 to April 12, 1985, at the Craiglands Hotel, Ilkely, England. The topics to be studied will include analysis of fundamental algorithms for picture element description, formulation, and display; review of developments in line, arc, conic, curve, and character representation and generation; encoding and compaction algorithms; higher level functions and applications; contouring, surface drawing, texture representation, scene generation, animation, and CAD; program transformations and automatic algorithm generation; and VLSI implementations.

The lecturers will include R. Brons (Katholieke University, The Netherlands); R.L.T. Cederberg (Imtec, Sweden); J.H. Clark (Stanford University and Silicon Graphics Inc.); P. Coueignoux (France); A.R. Forrest (University of East Anglia); H. Fuchs (University of North Carolina); R.A. Gued (Thomson CSF, France); F.R.A. Hopgood (Rutherford Appleton Laboratories); R.J. Lansdown (System Simulation Ltd.); B.B. Mandelbrot (Harvard University and IBM); A. Massorotti (Cybernetics Laboratory, Italy); and M.A. Sabin (FEGS Ltd).

NATO Advanced Study Institutes are primarily high-level teaching activities at which carefully defined subjects are presented to an audience of professionals and at a graduate level. Considerable benefit is derived from the fact that the ASI is an extended meeting with lectures and discussion sessions given by a selected team of international experts. Specific topics can be dealt with at the right depth in a relaxed atmosphere conducive to further discussion. Applications for places will be invited when the program is released, and a limited number of fellowships grants will be available for postgraduate and postdoctoral students. It is envisaged that the delegates attending the ASI will be scientists who have already specialized in the field or possess an advanced general background.

Anyone wishing to contribute a paper in the plenary sessions, or chair a discussion session, on any of the topics to be covered in the ASI is invited to send an abstract (up to approximately 300 words) as soon as possible to the Secretariat. Such contributions can be leading edge, review, or tutorial in character, and will probably complement the material to be covered by the invited lecturing faculty. There will be opportunity for the contributors of approved abstracts to write their material for publication in the Proceedings of the ASI, if they wish.

This Advanced Study Institute has been selected by NATO to be of special interest to industry. NATO wishes to promote closer international cooperation between university and industrial research on projects of mutual interest relating to the topics to be covered in the ASI. Any company wishing to be involved in the program, or to be a cosponsor of the ASI, is invited to contact the Secretariat: Rae A. Earnshaw; Dept. of Electrical Engineering and Computer Science; George Washington University; Washington, DC 20052, USA; (202) 676-7588/6083.

X3H3 accelerates standards development work

Recent decisions made by X3 Technical Committee X3H3, Computer Graphics, will accelerate development of standards thereby providing a focus for future graphics software and hardware advancements that will improve system performance as well as facilitate software and hardware portability.

Completion of the Computer Graphics Interface standard (formerly called the Virtual Device Interface) is accelerated by having the graphics output primitives and attribute specifications used in the CGI include primitives and attributes with identical functionality and format as those in the Computer Graphics Metafile standards (formerly called the Virtual Device Metafile).

A final draft of the closely related CGM standard has been prepared, with final adoption as an American National Standard expected in 1985. An important result of these decisions is that adoption of the CGM standard establishes a major portion of the CGI. This should assist computer graphics vendors who wish to begin evolving their product designs toward the output functionality called for in the dpANS CGM.

The CGM standard describes elements that standardize the content of graphical picture files. The committee decision to link the functionality and format of primitive and attribute specifications in the CGM and CGI will ensure that the data processing necessary to send picture files to peripheral devices will be kept to a minimum. CGM files can be stored and retrieved by various application programs and transported between software systems to accomplish picture exchange. In addition to output primitive and attribute elements, the raster, viewing, control, inquiry, and input functions required to support the interactive nature of the CGI are also being specified for inclusion in the CGI standard. Public review of the CGI standard is expected to begin in November 1985.

For further information concerning the decisions of X3H3, contact the committee chairman: Dr Peter Bono/ Graphic Software Systems/ P.O. Box 648/ Gales Ferry, CT 06335/ (203) 464-9350.

Monthly service aids computer publicity

A monthly subscription service, *Computer PR Update*, will help computer and office automation industry marketers obtain publicity for their products.

The service's four-page *Computer PR Update Newsletter* highlights new public relations opportunities, advises on media news and changes, and provides tips on obtaining optimal PR results. A second part of the services, *Computer PR Update Publications List*, contains up-to-date mailing information for industry newspapers, magazines, and directories. The list divides 230 publications into 22 different categories to facilitate targeted efforts.

The publicity working tool designed for hardware and software companies, peripherals manufacturers, distributers, associations, and seminar organizers costs $185 for a one-year subscription. Further information can be obtained from Cycon Communications Inc., 376 East St. Charles Rd., Suite K, Lombard, IL 60148; phone: (312) 495-0242.

Software system increases productivity of lab research staff

Laboratory research staff and computer staff can increase their productivity with the software system described in a recent Bureau of Standards report, *A Modular Data Aquisition and Display Software System for a Laboratory Environment.* The system, MADS, makes it possible for a researcher to devote more time to the processes related directly to an experiment and allows the computer staff to monitor computer system activity.

MADS consists of the reproducible computer programs that allow the researcher to collect, store, and analyze data graphically. Compressed file formats provide database storage and data analysis, especially when interactive computer graphics modules are used.

The illustrated report describes the processes involved in acquiring and analyzing experimental laboratory data when using a medium-sized computer in a multiprogramming environment with a modular software system. Research case studies are used to describe the functional capabilities and operational procedures of the system.

Copies of the 61-page report (stock number 003-003-02589-5) can be obtained by sending $2.25 in prepayment to Dept. 36-JS, Superintendent of Documents, US Government Printing Office, Washington, DC 20402. To order by Visa or Mastercard; phone (202) 783-3238.

First ADEE conference offers seminars and exhibits

Automated Design and Engineering for Electronics ADEE is the first technical conference and trade show to focus exclusively on CAD-CAE tools and technology for the design of electronics, according to Michael R. Indovina, manager of the February 26 through 28 show. Indovina says there is a demonstrable need for a good conference and show in this field. The technical conference will take place at the Anaheim Hilton and Towers in Anaheim, California.

The sessions being offered include the following topics: Do engineering workstations really work? (panel); Gauging engineering productivity; Trends in user interfaces; The emerging role of PC service bureaus; Trends in low-cost CAD systems; The customer/vendor interface for semicustom-I/O design; The role of personal computers in CAE; Links between design and test; Issues in automated system design; Managing CAE component libraries; Trends in CAE product development (panel); Trends in I/O-design product development (panel); Silicon compilation.

Exhibitors will be showing products in such categories as turnkey CAE workstations; conventional CAD; semiconductors; CAE hardware; and CAE software.

2,800-member machine vision group of SME gains association status

Forrest D. Brummett, president of the Society of Manufacturing Engineers, announces that the SME board of directors has approved full association status for the Machine Vision Group of SME, effective immediately. The official name of the new organization is Machine Vision Association of SME (MVA/SME).

Brummett said the rapid growth of the group from less than 50 to more than 2,800 members in six months clearly indicated the burgeoning interest in machine vision by industry throughout the world, and the need for a formal association to serve the technical needs of those managers and engineers involved. Explained Brummett: "MVA-/SME will coordinate and stimulate the exchange of information among individuals who are technically and professionally engaged in machine vision applications. MVA members worldwide will receive full SME membership services, including the new *Vision* technical newsletter and the benefit of other SME technical publications, conferences, expositions, and educational activities."

MVA/SME also is serving as sponsor, along with the parent SME, of Vision '85, the first conference and exposition on machine vision scheduled for Cobo Hall, Detroit, Michigan, March 26-28, 1985.

"The show has been expanded twice to accommodate the demand for exhibit space, with more than 50 exhibiting companies already occupying more than 30,000 square feet.," said James West, Chair of MVA/SME's Advisory Committee and vice president of Perceptron, Inc., Farmington Hills, Michigan.

West said MVA/SME is prepared to fulfill the machine vision needs of the full spectrum of industry by organizing technical committees covering Consumable Goods, R & D, Military Applications, Food Processing, Machine Control, Transportation, Education, Electronics, Robotics, Aerospace, Pharmaceuticals and Medical Devices, and Durable Goods.

"With outstanding programming, technical committees and technological communications," West reported, "we have the vehicles to serve MVA/SME members and their colleagues thoughout the free world effectively."

In addition to Vision '85 in Detroit next March, the following schedule of events has been announced by MVA/-SME: January 23, 1985, Machine Vision Workshop, Houston, Texas; February 6-8, 1985, Applying Machine Vision in Industry, (hands-on workshop), Orlando, Florida; February 11-13, 1985, Orlando, Florida, repeat of previous program; March 7, 1985, Machine Vision Workshop, Baltimore, Maryland; April 10, 1985, Machine Vision Workshop, Hartford, Connecticut; April 11, 1985, Advanced Machine Vision Workshop, Hartford, Connecticut; May 1-3, 1985, Applying Machine Vision in Industry, (hands-on workshop), Detroit, Michigan; May 6-8, 1985, Detroit Michigan, repeat of previous program; March 1986, Vision West Conference and Exposition, Los Angeles, California; For further information contact the Machine Vision Association of SME, One SME Drive, PO Box 930, Dearborn, MI 48121, (313) 271-1500.

Designers need consistent interface to CAD tools

Ware Myers, Contributing Editor

A recurring theme in recent conferences devoted to computer-aided design is the need for all software tools in a given system to interface to the user in a consistent way. (The same theme turns up in the personal computer world under the name of integrated software. Users would like to have the same key mean the same thing from one application program to the next.)

In the case of high-level CAD tools, this goal has not been reached, according to Arding Hsu, Liang-Hua Hsu, and Peter Ulrich of Siemens Research and Technology Laboratories, Princeton, New Jersey, reporting at the 1984 International Conference on Computer Design. Contemporary high-level tools usually operate in a stand-alone fashion, each having its own unique interface that the designer has to learn.

"Many aspects of system-level tool support and environments are still in the research stage," they said. Research to meet this need is currently in progress in their laboratory. At lower levels, however, commercially available CAE workstations do provide a consistent environment.

There are many ways to design the user interface, and there is no agreement on one best way. However, it does appear that any interface must implement at least three functions. First, it must provide one or more work areas—the space on a display screen in which the user can draw or view the results of his work. Second, the interface must provide a means by which the designer can give commands to the application program. Third, the interface must provide a means for the system to return messages to the user, such as work status, errors, system status, etc. In addition, a fourth function—supplying a way for the user to get extra help—is nice to have but may not be essential.

Designers can implement these four functions in various hardware forms. Work areas, menu, messages, and help may appear in separate windows on one screen, or may appear serially, upon user request, on a screen lacking windowing capability. The work areas can be removed to a separate screen to maximize the working space. Commands may be selected from a menu using function keys or a mouse-type device, or may be typed directly.

Ehud Gudes and Tal Dayan of National Semiconductor, Herzlia, Israel, chose to design five windows on a single display screen. They described this general command interface to the International Conference on Computer-Aided Design last November. The five windows display messages, graphics, menu, commands, and help information. In addition to commands, the command window displays prompts that call for the entry of parameters. The help window, then invoked, provides assistance that is related to the work currently in progress.

The intent of the National Semiconductor project is to standardize this one interface across all of its CAD programs. In this way the company will avoid the need to develop a new interface for each new application program. All it will have to do is match application program to the common interface. The project expects to minimize the amount of new code and to reduce future development time. Many of the commands, such as editing, help, abort handling, entering Unix shell, and directing input from a file, are common to all the application programs. National Semiconductor expects to use these general command interface-based programs to design a new generation of 32-bit microprocessors.

Intel has developed an engineering design environment that it calls Eden to serve two general purposes—to adapt readily to new hardware and to integrate many of Intel's CAD tools. According to Mark Vershel at the International Conference on Computer-Aided Design, Eden uses up to six windows: two for drawing, plus a menu window, a status window, a library window, and a help plane.

Each drawing window is independent of the other drawing window. For example, they may contain different views of the same design data or may display entirely different designs. The library window provides access to drawings contained in a central file, such as standard cells. The help information, however, is shown on an overlay plane, not in another window.

This interface also embodies three other goals: to use color intelligently, to take into account the experience level of the current user, and to permit the user to adapt the interface to his particular needs. In general, the interface uses colors consistently, that is, a color has the same meaning wherever it appears. For example, commands of the same type and function are displayed in the same color on all menus. Also, colors are used in their common meaning; for example, normal text is green, warning messages are yellow, and serious error messages are red.

Vershel argues that an interface should be designed to help novices and casual users while not hindering experienced users. To help inexperienced users, the interface presents commands arranged in a hierarchy of menus. Within the menus commands appear by category and color and remain in the same spatial arrangement. This enables the novice to find the same type of command in about the same location on all menus. When the user selects a command, step-by-step instructions appear in the status window. The help capability enables the user to obtain still more detailed assistance. On the other hand, experienced users may ignore these aids and speed up their work by grouping a number of commands that they use frequently into a macro command.

Because many users implement CAD systems in different ways, and a user's need may change even during the design cycle, Vershel believes that the user interface should be adaptable to these different needs. For example, the user should be able to select a menu item or a point on a drawing either by using the keyboard, a joystick, or a puck and tablet. It should be possible to assign frequently used commands to the puck buttons. The menu can be shifted by the user from its normal position along the right margin of the screen to the left margin. The user can redefine the boundary between drawing windows, either horizontally or vertically, and reset all default values.

The Magic VLSI layout system, designed at the University of California, Berkeley, also uses multiple windows, according to John K. Ousterhout, Gordon T. Hamachi, Robert N. Mayo, Walter S. Scott, and George S. Taylor at the 1984 Design Automation Conference. The major window may display an overall view while additional windows show details. Information can be copied from one window to another. Other windows provide menus and system maintenance functions. The user invokes commands by pointing with a mouse and pressing buttons on it or by typing a command on the keyboard.

Aries, a circuit design system, employs essentially the same screen arrangement for each different software tool it con-

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tains, reported William H. Kao, Mohammad H. Movahed-Ezazi, and Mark L. Sabiers of Xerox, El Segundo, California, also at the Design Automation Conference. At the top of the screen the message window provides program status and error information. In the middle of the screen are one or more control windows in which the designer can command actions. At the bottom a results window displays textual or graphical data.

From the reports given at this series of conferences, it appears that user interface designs are moving in the direction of fairly consistent use of multiple windows, but are retaining the capability to adapt to differing needs.

RIA Vision group selects new name, outlines goals

Automated Vision Association, or AVA, is the new name of the trade group formerly known as the RIV Vision Group. Formed by Robotic Industries Association earlier this year, AVA has announced its plan to "promote the acceptance and use of machine vision technology." Seven specific objectives have been set by AVA: (1) act as a liaison and interface with other associations and industries to promote machine vision technology and education; (2) support and develop standards activities that will enhance the use of machine vision technology; (3) keep abreast of and influence legislation affecting machine vision technology; (4) collect industry statistics and closely monitor trends within machine vision technology for manufacturing automation; (5) provide a forum of information exchange with the financial community; (6) promote machine vision via trade shows, publications, films, videotapes, and other forms of media and public relations; (7) provide members with programs on machine vision management issues through trade-related seminars and workshops.

AVA is chaired by Y. Len Gustafsson, president and CEO of Object Recognition Systems Inc., Princeton, New Jersey. RIA staff manages the group, which now includes representatives from more than 30 machine vision suppliers.

AVA's first major activity will be cosponsorship of the Vision '85 exposition at Cobo Hall in Detroit, March 26-28, 1985. Some 50 companies have already reserved more than 31,000 square feet of exhibit space for the show.

Increasing computer reliance seen as boon to fault-tolerant computer market

No-fault insurance has hit the computer industry: Errors and breakdowns have become so costly to commerce and industry that new breeds of fault-tolerant computers will expand from an estimated 1984 market of $6.1 billion to $21.3 billion by 1988, to post a compound annual growth rate of 37%

"Fault-Tolerant Computers" (#1331), a new study by Frost & Sullivan, says that actual sales of fault-tolerant models—which keep operating when part of the system fails—will not match their potential, but will nonetheless grow from $790 million in 1984 to $7.4 billion by 1988, exceeding 70 percent annual growth much of that time. This represents a steady climb in real sales from 13 percent of the 1984 market potential to 35 percent of 1988's (constant 1983 dollars used throughout).

"When a computer system becomes indispensable to the transaction of business, its utility changes in a fundamental way," the study points out, alluding to such examples as banking and financial service machines. "Where traditional computers were evaluated with an eye toward reducing the costs of data computation and storage, transaction systems are assessed as much for their direct contributions to increasing revenues...loss or corruption of on-line data means lost business and dissatisfied customers."

Thus, the increased control exercised by computers in such areas as on-line transaction processing, process control in industry, telecommunications, distributed data processing, and office automation is bringing a concomitant need for fault-free operation. The 223-page study evaluates the prospects for fault-tolerant, or FT, models in each of these areas.

On-line transaction processing applications dwarf all others in demand for FT computers. The potential in these applications will expand at an average annual rate of 32 percent from almost $4.8 billion in 1984 to $14.3 billion by 1988. In actual sales, they will account for 86 percent of total 1984 FT revenues ($680 million), though this will shrink to 70 percent by 1988 ($5.1 billion in sales).

Distributed data processing, or DDP, which has "only lately become feasible in a genuinely effective manner," represents the fastest growing and the second largest market segment for FT computers in both potential and actual sales. FT models will grow from a 15 percent share of DDP applications to one-third between 1984 and 1988. The potential FT market size will expand by 70 percent annually in that time, rising from $400 million to $3.3 billion, while actual sales nearly triple, from $60 million in 1984 to $1.5 billion by 1988.

Consensus bibliography technique aids access to literature

Ware Myers, Contributing Editor

"A serious research information crisis is being created," according to John L. Burch, publisher and editor-in-chief of a new series of what he calls consensus bibliographies. As the pace of research has accelerated in recent years, the pressure on scientists and development engineers and programmers to keep up has intensified. Yet the task of keeping up with the increase in information has become more difficult and time-consuming.

Burch's solution is to separate the gold from the ore—the material most useful to research users from the vast mass of research publications. He has founded a company, Ergosyst Associates, to carry out this process, He calls this literature review process bibliometric compilation. It is a refined version of statistical citation analysis.

"We choose the best information—the fertile 10 percent—by first identifying the world experts in a specialty field, then determining the sources those experts use," explained Berney Williams, manager of the firm's literature analysis and research group and inventor of the method. "In this way we establish the root disciplines and begin the long process of building a multidisciplinary database that we use to complile our critically condensed bibliographies. For example, the most complete review of the human factors of computing systems is an unpublished US Navy technical report that considers 20,000 citations. Only 4800 of these are relevant to human-computer interactions, and of these, only 25 are fundamental contributions and major advances."

"The worth of such knowledge filtering is obvious," Williams added, "particularly to someone whose time is extremely valuable or who operates under tight budgetary constraints."

The first of these bibliographies is *Computers: The Non-Technological (Human) Factors* edited by Burch and published in 1984. It recommends 61 titles in ergonomic and user-friendly design. A 17-page introduction defines terms, reviews the historical development of the field, and indicates the nature of current trends. The body of the volume is made up of "capsule reviews" averaging about one page in length.

The reviews cover five types of documents: technical reports, monographs, collections, proceedings, and special issues of journals. Individual papers are not included except as part of collections, proceedings, or special issues.

This bibliography is addressed to people who would like to learn about the human factors relevant to computing system design, but who lack the time or opportunity to become experts on the subject. The editor assumed that these readers would have different backgrounds, motivations, and levels of experience. He feels that the capsule reviews will be particularly useful to persons considering involvement in the field, researchers new to the field, and practitioners already active in some aspect of computers.

Except for the introduction to this volume, which tells something about the substance of the field, the capsule reviews do not provide much substantive information about their subject matter. Rather, they describe the contents of the documents, often listing the equivalent of the table of contents. The topics covered include workstation and interface design, cognitive psychology, ergonomic design, artificial intelligence, computer graphics, and software engineering.

The second bibliography issued by Ergosyst Associates is *Artificial Intelligence: Bibliographic Summaries of the Select Literature* compiled by Henry M. Rylko. It contains 210 entries averaging 2.4 pages. The descriptive reviews remain brief, but more entries contain lengthy table-of-contents material. The documents selected cover the areas of automatic programming, cognitive science, computer vision, expert systems, knowledge representation, machine learning, natural-language processing, problem solving, robotics, and theorem proving, plus historical and philosophic perspectives on AI.

Since many of the documents listed in these bibliographies are difficult to obtain through normal publishing channels, the Report Store (a division of Ergosyst Associates), 910 Massachusetts St., Lawrence, KS 66044, operates a document delivery service for them.

Ergosyst plans to release four more consensus bibliographies soon. The subjects are computer-generated display design, management training needs assessment, contemporary ergonomics, and computer ergonomics. The latter is to be a 645-entry version of the 61-entry bibliography listed above.

The company is four years old and has 20 employees. Its customers include IBM, AT&T, Control Data, Hewlett-Packard, Digital Equipment Corporation, and Honeywell.

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