Enlarge a portion of a *scene* without moving the *camera* point closer. Zooming does not alter the perspective relationships among *object*. See *dolly*.

Zoom

Corrientemente la cartografía animada es económica y técnicamente factible. Como otras expresiónes cartográficas, la animación de mapas exique que el cartógrafo considere un diseño especifíco y conceda la posibilida de su alteración. El decidir la forma de alteración es mas sencillo si uno reconoce que distintos paquetes de software de animación contienen distintas perspectivas–por ejemplo, el estilo de animación "flipbook" acomoda una distinta tarea que el programa de "actor y escenario" o el de "la camera y el modelo". Este excrito compara nueve metáforas de animación distintas, con un énfasis a los aperos que asisten al cartógrafo a hacer cambios especificos a su diseño cartografico.

**Nueve Metafóras
de la Cartografía
Cuádimensional –
La Selecíon de Aperos**

Extracto

cartographic techniques

SOFTWARE REVIEW

Software reviews will normally be solicited by the editors, but unsolicited reviews are invited for consideration. If you are using a piece of software useful in working with map information, and are interested in contributing a review, please communicate this interest to the editors.

FIRST ANNUAL SOFTWARE REVIEWS DIRECTORY

Robert P. Sechrist, Indiana University of Pennsylvania and Anne Gibson, Clark University, editors.

In response to the first issue of *CP*, Ruth Anderson Rowles suggested that an "annual list of of software reviews might be useful in planning software purchases." A good idea. *CP* number 2 included a 'call for mapping software review editors' who would be "willing to compile references from a wide variety of sources . . ." We are grateful to Bob Sechrist and Anne Gibson for harvesting the following list.

We hope to prepare an extended version of the list next spring. If you are interested in serving the cartographic community by maintaining such a list over the coming year, please contact David DiBiase, *CP* editor.

MS-DOS BASED SOFTWARE

Atlas*Draw. Stategic Location Planning Inc., San Jose, CA 95117, (408) 985-7400. Reviewed by J. Clark Archer, *The American Cartographer* 16:3 pp. 210-15. Digiting, editing, and cartometric analysis.

Atlas*Graphics. STSC, Inc., Rockville, MD 20852, (301) 984-5123. Reviewed by J. Clark Archer, *The American Cartographer* 16:2 pp. 134-38. Mapping software.

CCS Designer. Dexxa International, Burlingame, CA 94010. Reviewed by Lee De Cola, *The Professional Geographer* 41:4 pp. 494-95. Entry-level CAD package.

CoStat, CoPlot, CoDraw. CoHort Software, Berkeley, CA 94701. Reviewed by Rod B. McNaughton, *The Professional Geographer* 41:4 pp. 495-96. Statistical, plotting & drawing trio.

IDRISI. J. Ronald Eastman, Graduate School of Geography, Clark University, Worcester, MA 01610. Reviewed James B. Moore & Judy M. Olson, *The American Cartographer* 16:2 pp. 138-43. Image processing/geographic information system.

LaserCAD. A.I. Systems, Salt Lake City, UT 84121. Reviewed by James E. Moore, *The Professional Geographer* 41:4 pp. 496-97. General purpose drafting package.

Population Pyramids. Applied Population Laboratory & Center for Demography & Ecology, University of Wisconsin, Madison, WI 53706, (608) 2639484. Reviewed by Kavita Pandit, *The Professional Geographer* 41:2 pp. 233-34. Educational program teaching population pyramids demographically.

Roots. Laboratory for Computer Graphics & Spatial Analysis Graduate School of Design, Harvard University, Cambridge, MA 02138, (617) 495-2526. Reviewed by Peter F. Fisher, *The American Cartographer* 16:1 pp. 286-88. Fully interactive digitizing package.

SPSS/PC+, SPSS/PC+Mapping, SPSS/PC+Graphics, SPSS/Data Entry 11. SPSS Inc., Chicago, IL 60611, (312) 329-3300. Reviewed by Stan Duffy, *The American Cartographer* 16:1 pp. 57-60. Statistical package.

Surfer. Golden Software Inc., Golden, CO 80402, (303) 279-1021. Reviewed by Thomas W. Hodler, *The American Cartographer* 16:3 pp. 215-18. Contour and three-dimensional surface rendering package.

Survey System 1.1C. C & G Software Systems, Atlanta, GA 30341. Reviewed by Ryan Rudnicki, *The Professional Geographer* 41:4 pp. 498-500. Surveying package.

The Map Collection. MapWare, Long Beach, CA 90815, (213) 985-7808. Reviewed by Joseph Poracsky, *The American Cartographer* 16:1 pp. 288-93. Cloropleth, point symbol, contour & fishnet-type maps generator.

THEMAPS. Systems Research Institute, Pune, India. Reviewed by Manosi Lahiri, *The Professional Geographer* 41:4 pp. 500-01. Mapping package.

TurboCAD. Pink Software Development, Atlanta, GA 30350. Reviewed by Thomas W. Hodler, *The Professional Geographer* 41:2 pp. 234-35. CAD software.

MACINTOSH-BASED SOFTWARE

Adobe Type Manager 1.01. Adobe Systems, 1585 Charlestown Rd., PO Box 7900, Mountain View, CA 94039-7900, (415) 961-4400. Reviewed in *MacUser* February 1990 pp 64-65, *MacWorld* February 1990 pp. 180-181. PostScript type enhancer.

Accu-Weather Forecaster. Metacomet Software, Hartford, CT 06103, (203) 233-5911. Reviewed by Carlos Martinez, *MacUser* August 1989 pp. 64-68. Telecommunication & weather analysis package.

Aldus Pagemaker Color Extension 1.0. Aldus Corp., 411 First Ave. S., Seattle, WA 98104, (206) 622-5500. Reviewed in *MacWorld* December 1989 p. 185. Desktop publishing color-production extension.

Aperture. Aperture Technologies, 84 West Park Place, Stamford, CT 06901, (203) 975-7587. Reviewed in *MacUser* April 1990 p. 61. CAD/database hybrid application.

Azimuth. Graphsoft, 8370 Court Ave., Suite 202, Ellicott City, MD 21043, (301) 461-9488. Reviewed in *MacUser* April 1990 pp. 76-80. Map-drawing package.

Blueprint 1.0. Graphsoft, 8370 Court Ave., Suite 202, Ellicott City, MD 21043, (301) 461-9488. Reviewed in *MacWorld* February 1990 p. 195. CAD and drafting package.

DeltaGraph. DeltaPoint, 200 Heritage Harbor, Suite G, Monterey, CA 93940, (408) 648-4000. Reviewed in *MacUser* March 1990 p. 56. Graphing application.

Fontographer. Altsys, 720 Avenue F, Suite 109, Plano, TX 75074, (214) 424-4888. Reviewed in *MacUser* January 1990 pp. 75-77. Font design program.

KaleidaGraph 2.0. Synergy Software, Inc., 2457 Perkiomen Ave., Reading, PA19606, (215) 779-0522. Reviewed in *MacWorld* April 1990 p. 197, *MacUser* February 1990 p. 71. Plotting and analysis program.

Mapmaker 4.0. Select Micro Systems, 322 Underhill Ave., Yorktown Heights, NY 10598, (914) 245-4670. Reviewed in *GIS World* 2:6 pp. 24-26. Map-making software.

MiniCad. Graphsoft, 8370 Court Ave., Suite 202, Ellicott City, MD 21043, (301) 461-9488. Reviewed in

MacUser December 1989 pp. 67-68. Two and three dimensional CAD program.

Origins. Deltasoft, PO Box 55089, Tulsa, OK 74155-5089, (918) 250-5594. Reviewed in *MacUser* March 1990 pp. 70-72. 2-D drafting and 3-D rendering CAD program.

PixelPaint Professional 1.0. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086, (408) 245-2202. Reviewed in *MacUser* December 1989 pp. 62-63, *MacWorld* December 1989 p. 184-185. 24-bit color paint program.

Publish It! Timeworks, 444 Lake Cook Rd., Deerfield, IL 60015-4919, (312) 948-9200. Reviewed in *MacUser* December 1989 pp 60-61, *MacWorld* January 1990 pp 197-199. Page layout program.

Roots. Laboratory for Computer Graphics and Spatial Analysis, Graduate School of Design, Harvard University, Cambridge, MA 02138, (617) 495-2526. Reviewed in *The American Cartographer* 16:4 pp. 286-288. Interactive digitizing application.

Springboard Publisher II. Springboard Software, 7808 Creekridge Circle, Minneapolis, MN 55435, (612) 944-3912. Reviewed in *MacUser* April 1990 pp. 74-76. Desktop publishing package.

StrataVision 3D 1.0.2. Strata, Inc., 249 East Tabernacle, Suite 201, St. George, UT 84770, (800) 869-6855. Reviewed in *MacWorld* April 1990 p. 201. Computer-aided drawing and visualization package.

Smart Art. Emerald City Software, 800 Menlo Ave., Suite 102, Menlo Park, CA 94025, (415) 324-8080. Reviewed in *MacUser* January 1990 p. 83, *MacWorld* December 1989 p. 188-190. PostScript effects for type and graphics.

Super 3D. Silicon Beach Software, 9770 Carrol Center Road, San Diego, CA 92126, (619) 695-6956. Reviewed in *MacUser* March 1990, pp. 65-67. Tool for drawing 3-D objects.

Swivel 3D. Paracomp, 123 Townsend St., Suite 310, San Francisco, CA 94107, (415) 543-3848. Reviewed in *MacUser* March 1990, pp. 65-67.

Voyager Carina. Software, San Leandro, CA 94577, (415) 352-7328. Reviewed by Carlos Martinez, MacUser September 1989, p. 89. Educational desktop planetarium.

Wingz 1.0. Informix Software, Lenexa, KS 66219, (913) 492-3800. Reviewed by Lawrence Stevens, *MacWorld* June 1989, pp. 148-49. Spreadsheet with 3-D graphics.

World Class Laser Type. Dubl-Click Software, 9316 Deering Ave., Chatsworth, CA 91311, (818) 700-9525. Reviewed in *MacUser* December 1989, p. 70. Specialty laser type fonts.

USGS COMPUTER PROGRAMS

Over the past 25 years the U.S. Geological Survey has published about 500 publications that contain computer programs. A new indexed listing of these publications has been released by the USGS as Open-File Report 89-681. This listing includes all USGS publications with computer programs that were published through August 1989. Most of the reports included in the new publication provide computer programs only as hard-copy source code, although some of the more recent publications include programs on diskettes.

USGS computer programs are written for many different applications (resource appraisals, earthquake studies, water-quality analyses, seismic exploration,

image processing, mapping, etc.), and they are of potential interest to geophysicists, geochemists, geologists, and hydrogeologists.

The report citations are listed numerically by USGS publication series Professional Paper, Bulletin, Open-File Report, Water Resources Investigations, etc.). They are supplemented by author, subject indexes, and computer-acronym. The price of each publication is included in its citation. Some of the more popular computer programs included in the report are:

§ GSMAAP and GSDRAW; a program for IBM-compatible microcomputers to assist in compiling and drafting geologic maps and illustrations.

§ Potential-field geophysical programs for IBM-compatible microcomputers.

§ PCCONTUR, a general purpose contouring program for microcomputers.

§ muPETROL, an expert system for classifying world sedimentary basins.

§ SEISRISK III, a program for seismic hazard estimation.

§ MODPATH, programs that compute and display ground-water flow pathlines.

Copies of USGS Open-File Report 89-681, "Computer Programs Released as U.S. Geological Survey Publications through August 1989," can be purchased for $11.00 per paper copy or $4.00 per microfiche copy from Books and Open-File Reports, U.S. Geological Survey, Federal Center, Box 25425, Denver Colorado 80225. Orders must specify the Open-File Report number and title and must include a check or money order payable to the Department of the Interior – USGS.

REMOTE SENSING NEWS

Landsats 4 and 5 continue to operate nominally. Development of Landsat 6 continues with launch scheduled for 1991.

The Office of Management and Budget has reportedly decided to redirect funds totalling $9.5 million to cover operation of Landsats 4 and 5 through the second half of Fiscal Year 1990. Funding from the NOAA budget only carries Landsat operations through the first six months of FY1990. "EOSAT is still waiting for official notification from the government on funding direction for the last six months of FFY 1990," said EOSAT President C.P. Williams.

The NOAA Budget request for FY 1991, released earlier this week, includes $36.3 million for the Titan II launch of Landsat 6. The source of operations funding for Landsats 4 and 5 in FFY 1991 is to be decided by the Administration and Congress.

Quayle Pledges Support. In a December 20, 1989, letter to Rep. George Brown of California, Vice President Dan Quayle outlined the administration's policy on maintaining the continuity of the Landsat program. "We plan to continue operating the Landsat satellites 4 and 5 as long as they function and to complete manufacture of Landsat 6," Quayle said, adding, "We plan to replace Landsat 6 in about 1996." The Vice President, who also serves as chairman of the National Space Council (NSC), noted the administration had not seen the need to include Landsat 7 development funds in the Fiscal Year 1991 budget, but the NSC will address that issue later this year. An NSC report on Landsat 7 recommendations, originally scheduled for release in 1989, is due out later this year.
Landsat World Update, January 31, February 28, 1990.

The SPOT 2 Earth observation satellite was successfully launched into an 830 km high sun synchronous orbit at 8:35 P.M. EST on January 21, 1990. All systems are reported to be operating successfully. SPOT 2, and its predecessor SPOT 1, are part of a series of commercially operated satellites which acquire detailed digital images of any location on Earth. While SPOT 2 was originally intended to replace SPOT 1, the latter is still operating successfully and both satellites will be operated concurrently.

The SPOT system worldwide, and particularly SPOT Image Corporation in the U.S., have been at the forefront of commercial remote sensing since the launch of SPOT 1 in February, 1986. SPOT worldwide sales exceeded $20 million in 1989, an increase of over 30 percent from the previous year.

For further information contact: Clark Nelson (703) 620-2200.

THE GIS TUTOR

GIS Tutor is a set of HyperCard stacks developed at Birkbeck College in England. It is an excellent example of the effective use of the hypermedia concept applied to education.

GIS Tutor is an interactive program using pictures and animation to explain some basic GIS concepts and terms. The user may take full advantage of the hypermedia organization by following his or her train of thought through the stacks, rather than the author's fixed idea of information organization, as in a book. The tutor consists of 11 stacks and requires almost 800k of disk space, but the divisions between stacks are transparent to the user.

GIS Tutor is oriented to newcomers to the GIS field, but even old hands will likely find something of interest. Topics covered include data capture, editing, data

structures, analysis, and transformations. In addition, it includes a bibliography of GIS literature, a GIS systems directory and an index (called an encyclopedia in the program). Navigation around the stacks is accomplished via clickable arrows and buttons, and no previous Macintosh experience is presumed. An index map and contents page allow the user to go directly to the subject of interest. The explanations of user navigation in the stack are good, but some beginning users may become confused if they hold too tightly to the analogy of traditional print media. The stack design only allows the user to jump back and forth between 'chapters,' a process so transparent that some users may be unclear as to their location in the stack. This should not present a real problem, however, since it really is not necessary for the user to know his or her physical location in the stacks.

Usually it will take two or three hours to go completely through the tutor, but the user can easily go through as little or as much of the stack as desired and then just pick up where he or she left off. The tutor tracks the sections completed and offers the user the option of printing a report of sections completed at the end of a session. The artwork and animation are quite good and the careful user will notice considerable detailing incorporated into the stacks.

GIS Tutor requires HyperCard to run and, as a consequence, is subject to some of its limitations, such as limited screen size and monochrome display. The minimum hardware requirement is a Mac Plus with an external drive. Suggestions for improvement include an attached user notes stack and a glossary explaining terms not familiar to users. However, a major upgrade, GIS Tutor II, which will roughly triple the size and content of the tutor is

already in the works and should be available sometime in the late spring, according to co-author Dr. Jonathon Raper of Birbeck College.

Overall, this is an excellent tutorial on the basics of GIS, which is primarily directed to beginners. The graphics and animation make the subject very understandable and even fun. The interactive format allows the user to proceed at this or her own pace and seems to be much more effective than the traditional print media.

The GIS Tutor is distributed in the United States by GIS WORLD, Inc. and sells for $99.95.
GIS World, February/March 1990

ANIMATED CONGRESSIONAL VOTING PATTERNS

Two Carnegie Mellon University political economists are creating animated maps on videotape of Congressional voting patterns. The video maps have enabled Keith T. Poole and Howard Rosenthal to reveal some interesting patterns in a massive set of data.

The 11 million roll-call votes made in Congress from 1789 to 1989 are the raw material. The votes of individual members of Congress are mapped along two ideological dimensions. The horizontal dimension ranks the economic ideology of the member: conservatives are placed to the right of center on the map, and liberals are placed to the left of center. The vertical axis ranks the social ideology, with conservatives above center and liberals below center. With these two dimensions, the model represents over 85 percent of the 11 million individual votes involved.

This spatial model is surprisingly good at showing voting clusters. In fact, the researchers have devised a maximum likelihood algorithm that plots a cutting line that separates the yeas from the nays. The video maps show

that pre-Civil war members voted more or less along party lines on economic issues but literally split north and south on the social issue of slavery. In the 20th century, there has been an ideological implosion and the plotted positions have moved closer together. Although, according to Rosenthal, "there's always an economic redistribution conflict coexisting with whatever is a critical disturbing issue at the time."
Pixel: The Magazine of Scientific Visualization, January/February 1990

SURVEY RESULTS SUGGEST INCLUDING AUTOCAD IN CURRICULUM

Charles A. Noran, Department of Geology and Geography, Hunter College, recently completed a survey to determine how and to what degree AutoCAD was being used. The results of his survey were to be used to determine the appropriateness of teaching AutoCAD as part of Hunter College's graduate curriculum in geography.

Utilization

Noran surveyed 100 engineering, cartography, and photogrammetric organizations across the U.S.A. by questionnaire. Forty-one responded. Of those responding, 68 percent were AutoCAD users. Of those, 70 percent relied exclusively on AutoCAD for their automated mapping and GIS needs. The remainder used products such as ARC/INFO, Intergraph, MicroMap, Kork DMS and MPAS 300. Fifty percent of the firms reported using the program for automated cartography, 32 percent for GIS applications, 22 percent for engineering projects and 25 percent for digital photogrammetric mapping. Unfortunately, Noran's questionnaire did not probe more deeply into these applications.

Training

Noran also inquired as to the level and source of AutoCAD training. Organizations reported having between two and twenty trained AutoCAD users. The mean number was eight. Nineteen of the forty-one responding organizations reported conducting in-house AutoCAD training. Five relied exclusively on outside training programs; fourteen relied exclusively on in-house programs. The balance relied on a combination of in- and outside training. On a scale of one to ten, 1 – not useful and 10 – indispensable, the average usefulness of previous AutoCAD training was 6.1.

Conclusion

Based on his survey, Noran concluded that the widespread use of AutoCAD and the prevalence of in-house training programs argue for the inclusion of AutoCAD training in a graduate geography programs. He feels the program's versatility and flexibility will permit its easy integration into a department's curriculum. He recommends its use in courses in automated cartography, photogrammetry and airphoto interpretation, in particular.

AutoCAD — Yes and No

There is no question that AutoCAD has captured a major share of the Computer-Aided Design and Drafting market. From our own research, we know that most photogrammetric firms are frequently required to deliver planimetric and topographic base maps to design engineers in DFX format for use with AutoCAD. In most of these cases, the basemap is produced in a format other than DFX and translated into that format for delivery.

We also acknowledge the growing popularity of AutoCAD-based software, such as TerraCAD, FMS/AC and MunMap-Geo/SQL, for the development of

municipal utility system inventories and geographic information systems. Yet, we wonder about Noran's conclusion.

If a geography department considers itself responsible for training personnel for engineering and photogrammetric mapping firms, we agree with Noran. To the degree that it views its mission as the teaching of the principles of cartography and geographic information systems, we suggest that priority be given to programs such as MapInfo, Atlas*Graphics, MapMaker, Atlas* GIS, GISPlus or PC-ARC/INFO.

For additional information, contact Charles A. Noran, (212) 772-5267.
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cart lab bulletin board

This forum is offered to encourage communication among practitioners at a time of rapid technological transition. Questions, comments, and announcements are invited.

ACADEMIC CARTOGRAPHY LABS IN THE U.S. AND CANADA: A SURVEY

Roy Doyon,
　University of Massachusetts
Anne Gibson,
　Clark University

In mid-1988 we surveyed academic cartography labs in the U.S. and Canada. Our intent was to gather and disseminate information on those labs in the hope of providing some perspective on what academic cartography lab managers do and how their jobs are structured. The survey contained questions on personnel data relating to the lab manager, his or her responsibilities, lab clientele, the type of work performed, production methods, equipment, staffing, and billing policy.