Year 2000 Compliance: Will Your Computer Survive the New Millennium?

by Kent Kuo and Aviva Luria

There’s a buzz in the air about something called the Year 2000 problem, and nearly as many theories and opinions as there are people discussing it. Depending on which Web site you browse or whom you talk to, you may end up with an impression that the Year 2000 problem is anything from an impending disaster to an overblown hoax.

The truth probably lies somewhere in between. In July, the National Science Foundation warned NSF grant recipients that an unmitigated Year 2000 problem was a serious issue. “Many computer systems may experience operational difficulties because they are unable to handle the change from the year 1999 to the year 2000,” said NSF director Neal Lane. NSF grant recipients, he said, are responsible for taking all steps necessary to mitigate potential problems. The National Science Foundation should be notified if an awardee concludes that the Year 2000 will have a significant impact on its ability to carry out an NSF grant.”

Just what is this “Year 2000 problem”? In the early days of computing, computer memory was limited and therefore extremely valuable. To save memory, many programmers used a two-digit field (rather than a four-digit one) to record the year (‘97 rather than ‘99?). Microchips with the same design have been embedded in nearly every electronic device developed over the last 30 years. Using this two-digit field has saved money over the years by saving computer memory, but with the year 2000 approaching, it has become a problem. Coded as ‘00, the year 2000 will be read by affected computers as 1900. Systems of all types and sizes may corrupt data or reports. These in 1997.

Sports Mechanics Lab Helps Top Athletes

by Aviva Luria

What do throwing a javelin and driving a bobsled have in common? Some very important things, according to Mont Hubbard, Professor of Mechanical and Aeronautical Engineering. Like all sports, each involves motion, and motion can be described by the laws of mechanics. Both sports are among those that have been analyzed by Hubbard and his graduate students in the Sports Mechanics Laboratory here at UC Davis.

As director of the laboratory, Hubbard uses computer simulation and complex computation to help athletes improve performance. Hubbard accomplishes this by quantifying those aspects of a sport that are “optimizable” or that allow for improvement.

Optimizing the Flight of a Javelin

Take a look at the javelin’s motion. The athlete runs 20 to 30 meters before throwing the javelin, a motion that lasts approximately one-seventh of a second. The conditions on the javelin at the instant of its release determine how far it will travel.

Hubbard and his students have created a computer program that takes these quantifiable conditions and integrates them with equations of motion to determine the trajectory of the javelin. The program then creates a real-time graphical representation of the flight sequence. Using the system, a user can compare various factors—different javelins, changed conditions—that affect the distance the javelin travels.

Yet even if the thrower knows what conditions are optimal, the information may not be useful unless the athlete also has information about his or her actual performance. Another program developed by the lab measures athletic performance, making it possible to provide specific advice. Reflective tape is applied at equal points along the length of the javelin, and a high-speed video system automatically digitizes these points as the javelin travels through the air, quantifying the release conditions.

“If we can tell the thrower about the conditions of his or her throw, the athlete can compare these to the optimal conditions and change technique accordingly. It’s a measurement tool that allows the athlete to hone in on the best set of release conditions,” Hubbard says.

This analysis is especially important given the history of change in the sport. From the 1940s through the 1980s, the shape of the javelin had become so refined and so aerodynamic that it could actually generate enough lift to fly. Then, in 1986, after a javelin flew out of control and came close to hitting an Olympic official, the shape was again redesigned, making it more manageable, less erratic in its flight, and more resistant to traveling long distances.

Historically, world records have generally improved, Hubbard says, yet in 1986, after the redesign of the javelin, the 104.7 meter world record plummeted by about 15 meters. “The change had an immediate, abrupt effect on the world record, but now it’s on its way up again,” he says.

See Sports on Page 2

It’s Time to Get Ready for Our New Area Code!

UC Davis, the City of Davis, and the majority of Yolo County will join 22 other Northern California counties in switching to a new 530 area code. Beginning November 1, both the old 916 and new 530 area codes will be functional, with a permisive dialing period expected to last approximately six months, through late April 1998, when the 530 code is fully implemented.

Now is the time to begin planning for the change by updating your publications, business cards, stationery and other materials on which telephone and fax numbers appear. When the 530 area code is fully implemented, changes also may need to be made to programmable communications equipment, such as facsimile machines, auto-dialers, telephones, and programmed telephone lists.

Grazia Jaroff, Assistant Director of Communications Resources, suggests we think in terms of moving to a new area code with all communication equipment. Think about pagers and cellular phones, for instance. Dialing those you call regularly now may require a new area code or require that you add your area code when leaving your number for call back.

Please note that both Dixon prefixes (678 and 693) will become part of the 707 area code in October. Because long-distance telephone charges are based on distance rather than area code designations, the price of telephone calls will not be affected because either of these changes.

Questions can be directed to Grazia Jaroff at gjaroff@ucdavis.edu or 752-5940.

Train At Your Own Pace

UC Davis faculty, students, and staff have access to the video library of self-paced learning materials located in the New Media Distribution Lab in 1101 Hart Hall. Learning materials range from introductory to advanced levels; many have a sample workbook and self-test. Summer hours are 8 a.m. - 6 p.m. Monday-Thursday, 8 a.m. - 5 p.m. Friday. For more information, see http://im.ucdavis.edu/rooms/selfpaced.html, send e-mail to leaml@ucdavis.edu, or call 752-2911.

The result is not that the world will come crashing down at midnight, New Year’s Eve, but that computers will start generating inaccurate results.”

— Kevin Schick, Gartner Group analyst, on the Year 2000 problem quoted in the New York Times
The Bobslde Simulator

Bobsledding presents its own challenges for engineers. Unlike a javelin throw, a bobsled run involves continuous motion. Although a bobsled shape is very different from that of a javelin, and it travels on snow rather than through the air, the main difference is that the athlete controls its motion.

Hubbard and his students in the Sports Mechanics Lab have created a bobsled simulator that uses virtual reality to display the most effective way down a particular course. The simulator surrogates data to four sensory systems that the driver would experience on an actual run: visual data (the view the driver has on the way down the track); vestibular (inner ear) sensations created by angular motions and accelerations of the head; tactile experience, or the “feel” of driving a bobsled; and auditory cues, similar to those the driver would hear on an actual course.

Solving equations of motion and incorporating the driver’s steering into those equations one hundred times per second, the simulator draws pictures thirty times per second, thereby allowing the driver’s sense of virtual reality. But most important, the program provides information to the driver that he or she wouldn’t get in an actual run.

"We’re computing everything," says Hubbard, "the forces on the sled and where the sled goes in response to the driver’s steering. We can tell drivers where the sled went, and the difference in velocity from the fastest path down the track so

grammable sprinkler systems are all potentially dangerous. The problem might affect operating systems (Windows 3.1 or 3.11), software compilers, applications (Microsoft Word version 6.0, Lotus 123 versions 4 and 5), peripheral systems (tape backup systems), queries, spreadsheets, or database reports. The problem may exist in all types of personal computers. IBM-compatible PCs, especially those built prior to June 1996, will not be affected by this error until after the turn of the millennium. Even those built since June 1996 should be checked because some PC vendors might not have made the change. While the transition to UC Davis is yet to be made, many local systems around campus have yet to be evaluated.

In addition to its analysis of the UC Davis Sports Mechanics Lab, the report examined the potential for use at the U.S. Olympic Training Center in Colorado Springs, loaned by IBM for the Winter Olympics, Salt Lake City has recently opened its new bobsled facility. IBM is also involved with the U.S. Skeleton Federation and the U.S. Bobsled Federation, particularly for conducting research and development.

In addition to its analysis of the javelin throw and bobsledding, the Sports Mechanics Laboratory recently helped create a network for use at UC Davis. This network was designed to help student athletes with a computer simulation package for use in their daily practice.

Robin Harrington is the Director of the Computer Services Centre at the University of Canterbury in Christchurch, New Zealand, and an avid reader of the I.T. Times. His interest in a story about the network ports installed in the Shields Library (see April 1997 issue) prompted a follow-up question: Might he and other information technology directors stop by UC Davis on a trip to see how Apple Computer was changing its product line? The answer was an emphatic yes.

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**PROJECT UPDATE**

**NetWork 21**

**ATM Chosen as NetWork 21 Electronics**

On July 9, the NetWork 21 Oversight Committee accepted the recommendation of its technical subcommittee to designate ATM, or Asynchronous Transfer Mode, as the technology of choice for the NetWork 21 electronics. The decision was made within the two-month time frame designated at the Think Tank session in May.

At the two-day Think Tank, technical experts from five UC campuses (including UC Davis) and Stanford analyzed the possibilities for NetWork 21 electronics and narrowed the choice to two options: fast ethernet and ATM. The technical subcommittee used the Think Tank recommendations to perform a detailed evaluation, which showed distinct advantages of ATM.

While ATM is the more expensive option, the additional cost is anticipated to buy longevity in the network infrastructure. ATM is easier than fast ethernet to upgrade, making improvements to the backbone less costly in the future.

With the choice made, bid specifications can be detailed. Next, criteria will be developed for multiple pilots, along with performance criteria by which the pilots will be evaluated. Implementation of the final stage of NetWork 21 (Stage 3) is planned for February 1998, for an October 1998 completion date.

For an overview of the re-evaluation process, see http://net21.ucdavis.edu/reevhtm. More detailed information, together with a glossary of terms, may be found at http://net21.ucdavis.edu/assess.htm. E-mail comments, questions, and concerns to net21electron@ucdavis.edu.

**Town Hall Meeting**

Members of the NetWork 21 Oversight Committee and NetWork 21 project directors led a Town Hall Meeting on July 8 for the campus community to discuss and provide input into the NetWork 21 electronics plan. Jay Lund, chair of the Oversight Committee’s technical subcommittee, reviewed the history and mission of the re-evaluation process. Russ Hobby, one of the architects of the original NetWork 21 design, described in detail the Think Tank evaluation process and enumerated its recommendations: (1) A timely, detailed evaluation of fast ethernet and ATM; (2) evaluation of standards versus costs of each; (3) design of multiple pilots to ascertain whether the equipment will meet NetWork 21 requirements; and (4) implementation of the electronics phase of the project within the next eight months.

Lund explained that the technical subcommittee used two levels of criteria to evaluate and compare the various technologies. First they applied screening criteria in order to narrow down the 22 options to those that were acceptable. These criteria were based on functionality (including the requirement that Virtual LANs (VLANs) be supported) and cost (requiring that it remain within the $23 million cap for the entire NetWork 21 project). The choices remaining after applying these criteria still provided for both a Fast Ethernet or an ATM solution. Next, ranking criteria were applied. In comparing ATM and fast ethernet on the bases of cost, bandwidth, functionality, operability, and risks, ATM ranked higher in nearly all categories. The primary exception was cost. While the costs used in the analysis were estimates, rather than those of bidding vendors, it was proposed that the cost for ATM would be an additional $700,000. (For more details about the ranking criteria, see http://net21.ucdavis.edu/assess.htm.)

**Switching to the Fiber-Optic Backbone**

NetWork 21 technicians are in the process of cutting over campus users to the fiber-optic infrastructure. To date, approximately 4,000 users previously connected to UCDNet have been connected to the fiber backbone. All users in previously unconnected buildings in NetWork 21-designated Areas have been cut over as have all DaFIS users. Another group of nearly 1,000 “problem LAN” users were connected via switched 10BASE-T technology in late June. These users have reported a notable increase in the speed of their connections.

NetWork 21 technicians will spend the next two and a half months on ReNet, connecting approximately 3,750 residence hall NAMs to the backbone using switched 10BASE-T technology. ReNet connections are expected to be complete by mid-October.

The next phase will connect approximately 2,000 unconnected users in connected buildings. All users in the NetWork 21 Areas will be connected to the fiber-optic infrastructure by Thanksgiving. This will pave the way for Stage 3 of the NetWork 21 project (the implementation of ATM electronics) in early 1998.

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**At Home on the Web**

**Editor’s Note:** At Home on the Web is a regular feature of the I.T. Times. If you have a Web site you would like featured in this column, send e-mail to itpubs@ucdavis.edu.

**I.T. Employment Opportunities**

http://it.ucdavis.edu/emploi.htm

Information Technology’s staff position openings are now listed online at this site, with links to the Human Resources listing for each position and to the HR page where you can find application forms.

**Centers for Water and Wildland Resources**

http://www.noas.ucsb.edu/esp/

The Centers for Water and Wildland Resources has developed an online, web-based Directory of Water and Wildland Expertise in the University of California system. This directory was traditionally published in hardcopy, but is now available as a searchable, comprehensive database containing listings of UC specialists, faculty and staff members involved with water-related and wildland-related research. The directory will be expanded over time to include California State University and state and federal scientists.

**Commission on the Environment**

http://environment.ucdavis.edu/

The UC Commission on the Environment promotes multidisciplinary research on local, regional, and global environmental problems. Links include a detailed statement of the commission’s objectives, a description of funded projects, and a listing of the many special-interest workgroups operating under the commission’s umbrella. This well-designed site is worth a look.

**I.T. Times Index**

http://it.ucdavis.edu/i.t/times/itltimesindex.htm

Finally, there is an online index to all those back issues of the I.T. Times Going back to Fall Quarter of 1993, this topical index has links to all the articles online, so you won’t need to search around in file cabinets to find the ones you want.

**Correction**

In the June edition of At Home on the Web, the item “Personnel Policy Online” gave the impression that Human Resources maintains the electronic version of UC’s policy manuals. This is not the case; the 130 page links to the official electronic version of the manuals, which are maintained (in both electronic and hard copy) by the Office of the Chancellor. The home page for the manuals is http://www.mrak.ucdavis.edu/web-man/ manuals.htm. From there, you can reach the UCO administration manuals, as well as all the Universiwide manuals maintained by the Office of the President. We regret this error and any confusion it may have caused.

— Richard Darsie

Richard Darsie is Webmaster for I.T. Information and Events.
Administrative Information Systems Move From A11

The A11 mainframe, which for years has hosted a number of campus administrative functions, will semi-retire in July and will be permanently decommissioned in February 1998. Functions supported by the A11 have included general ledger, accounts payable, salary-roll cost, equipment inventory, permanent budget, staffing list, and grounds and buildings. Many of these functions will be replaced by DaFIS. (See the chart below for a list of major administrative systems and their replacements.

In preparation for the A11 decommission, the Information Technology Data Center will contact all account users to find out the length of time they will need accounts and disk files. Users will also have the opportunity to determine the disposition of their A11 tapes. A list of each user’s assigned tapes will be included with the letter.

The following is the overall sequence of steps being taken to complete the A11 96/97 fiscal year administrative functions and decommission the A11.

• All administrative functions and transactions for June 1997 will be completed in early July.

• Administrative functions of many of the A11 systems will be moved to replacement systems in early July.

• Fiscal closing processes for the A11 administrative systems will be completed in July and August.

• System clean-up will be performed on the A11 between September 1997 and January 1998. Production accounts will be deactivated, unneeded disk files will be removed, and A11 tapes will be archived or disposed of based on consultation with users.

• The A11 will be decommissioned on February 28, 1998.

<table>
<thead>
<tr>
<th>CURRENT SYSTEM</th>
<th>REPLACEMENT SYSTEM</th>
<th>UNIT RESPONSIBLE FOR REPLACEMENT SYSTEM</th>
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</thead>
<tbody>
<tr>
<td>General Ledger</td>
<td>DaFIS</td>
<td>Accounting and Financial Services (AFS)</td>
</tr>
<tr>
<td>Accounts Payable</td>
<td>DaFIS</td>
<td>Accounting and Financial Services (AFS)</td>
</tr>
<tr>
<td>PTRS (Payroll Time Reporting System)</td>
<td>PTPRS (UCOP Time Reporting System)</td>
<td>AFS Payroll Division</td>
</tr>
<tr>
<td>Salary-Cost Roll System</td>
<td>Committed Salaries (UCOP System)</td>
<td>AFS Payroll Division</td>
</tr>
<tr>
<td>Equipment Inventory</td>
<td>CAMS (Capital Asset Management System)</td>
<td>Materials Management and Equipment Inventory</td>
</tr>
<tr>
<td>Grounds &amp; Buildings</td>
<td>Departmental Billing System</td>
<td>Facilities Services</td>
</tr>
<tr>
<td>Permanent Budget</td>
<td>DaFIS (Base Budget Adjustment)</td>
<td>Planning and Budget</td>
</tr>
<tr>
<td>EDB (Employee Database)</td>
<td>Payroll/Personnel Data Warehouse</td>
<td>AFS Payroll/Human Resources</td>
</tr>
</tbody>
</table>

The Data Center and application support staff welcome your comments, suggestions, and questions during the A11 deactivation process. For account deactivation or disk storage needs, contact Kent Fugate (754-8300; krfugazi@ucdavis.edu) for tape archival and disposal information. Contact Denny McArthur (754-9950; cmcarthur@ucdavis.edu) for employee database (EDB) information, contact Linda Honzik (754-8772; lhonzik@ucdavis.edu) for information on Electronic Mailing Lists, or contact Ray Reeves (757-8974; reeves@ucdavis.edu).

I.T. CALENDAR

AUGUST 1997

S M T W T F S
3 4 5 Intro to Image Manipulation 6 7 WW Frames 8 9
10 11 12 DaFIS 13 14 15 16
17 18 19 MEVYL Searching 20 21 22 23
24 25 26 MEVYL Searching 27 28 29 30

SEPTEMBER 1997

S M T W T F S
8 9 Mail List Administration 10 11 Class Electronic Mailing List 12 13 Expo '97
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30

Design Students Win Award

Three design students were awarded prizes in the 1997 Computer Integrated Textile Design Association Scholarship competition. This was the first year that UC Davis students entered the competition.

Undergraduates Lisette de Berry and Meriweather Engstrom and graduate student Johanna Escalante (MFA ’97) created their contest entries in Emily Dubois’ Computer Integrated Textile Design course. Dubois is a visiting assistant professor in the Department of Environmental Design.

De Berry and Engstrom worked together to design three related fabrics for a tropical hotel, creating a colorful story board that won second place in the Hotel Lobby category. The two received $1,000 and a travel stipend to the CAD Expo Conference, held in New York this month. Escalante received Honorable Mention and $500 for her fabric designs inspired by pre-Columbian motifs.

Participating schools included the Rhode Island School of Design, Parsons School of Design, North Carolina State University and others with top design programs. The winning fabrics will be exhibited at the awards ceremony at CAD Expo, as well as at a later conference in North Carolina.