



CONTENTS

FROM THE TOP2
IN THE TRADES2
ANNUAL MEETING3

STUDENT NEWS3
ERGONOMICS IN DESIGN4
INSIDE HFES6
IN THE NEWS6

ADL and the AFRL

By Barry P. Goettl & Alan Ashworth

Maintaining a high state of military operational readiness is crucial to national defense. Sophisticated weapons and communications systems have driven up training requirements, while the dispersed nature of expeditionary forces requires a shift in training methodology from classical classroom instruction to distributed learning.

To meet both these needs, the Office of the Secretary of Defense has created the Advanced Distributed Learning initiative (ADL), whose mission is “to provide the highest quality education and training that can be tailored to individual needs and delivered cost effectively, anywhere and anytime.”

Human Factors and ADL

The ADL mission has important human factors/ergonomics (HF/E) implications in the areas of information displays, training, cognitive engineering, and computer systems. Very real challenges exist in developing courseware elements that can be readily shared across platforms. Just as important are the questions of how training should be accomplished and how training materials should be displayed. These questions require HF/E expertise in the areas of training, cognitive engineering, expert systems, and display design. Although the Internet is the means of delivering training materials worldwide, HF/E professionals must ensure that the content of the training is effective and useful.

ADL Objectives

As noted on the ADL Web page (www.adlnet.org), the objectives of the DoD ADL initiative are the following:

- Develop guidelines needed for large-scale development and implementation of efficient and effective distributed learning.
- Identify and promote business models and economic incentives that serve the needs of both consumers and providers of distributed learning.
- Establish a rapidly growing networked community of education and training consumers.
- Stimulate large-scale collaborative developments by organizations that share learning requirements.
- Identify technical challenges that exceed the current state-of-the-art, and initiate collaborative research and development programs to overcome those challenges.

- Share lessons learned and accelerate the development of a robust, highly diverse, object-oriented open environment for advanced distributed learning.

Human Factors and ADL

The ADL mission to deliver courseware and training “anywhere, anytime” has important human factors/ergonomics (HF/E) implications in the areas of information displays, training, cognitive engineering, and computer systems. Very real challenges exist in developing courseware

elements that can be readily shared across platforms. Just as important are the questions of how training should be accomplished and how training materials should be displayed. These questions require HF/E expertise in the areas of training, cognitive engineering, expert systems, and display design. Although the Internet is the means of delivering training materials worldwide, HF/E professionals must ensure that the content of the training is effective and useful.



Figure 1: Team Training Research and ADL Laboratory at Brooks AFB, Texas.

Sharable Training

The aforementioned objectives are being met through the development of a common technical framework for computer and Internet-based learning that will foster the creation of reusable learning content as “instructional objects.” This framework is supplied by SCORM (Sharable Content Object Reference Model), which is an evolving standard for the technical aspects of distributed network delivery, the knowledge structuring for reusable courseware objects, and pedagogical approaches to distributed instruction. In collaboration with various standards organizations (such as the Institute of Electrical and Electronics Engineers’ Learning Technology Standards Committee, the Instruction Management Project, and the Aviation Industry Computer-Based Training Committee), SCORM is now in version 1.2 and is available for downloading from the ADL Web site. SCORM specifications are intended meet the following DoD criteria:

- *Accessibility* – the ability to access instructional components from one remote location and deliver them to many other locations.
- *Interoperability* – the ability to use instructional components developed in one location with one set of tools or platform in another location with a different set of tools or platform.

continued on page 4

The Perfect Gift

By David L. Post, HFES President

Most of us have bought a present for someone at the last minute. It's usually a vexing experience; we are rushing about—often with no definite idea of what we're looking for, yet certain that if we keep looking long enough, we'll suddenly spot The Perfect Gift. Typically one returns home with something less than perfect and a soon-to-be-forgotten resolve that the next time will be different.

I've learned from these searches that the best time to be shopping for friends and loved ones is always. Be alert to hints, intentional or otherwise, and, when visiting stores or flipping through catalogs, keep other people in mind. Having that perfect gift in hand months ahead of schedule is very comforting. (My wife, Connie, can tell you I don't necessarily *practice* this lesson, but I have at least learned it.)

The same principle applies to the Society's awards program. Each year the October *Bulletin* contains a call for Fellows nominations and the December *Bulletin* contains a call for our other awards. If you wait until these calls appear, you may find yourself short of ideas for nominees or time to prepare a nomination package. So when's the best time to be thinking about awards? That's right (all together now)—*always*.

When a colleague tells you about a terrific project, consider the possibility that it's worthy of an HFES award. Did it contribute substantially to safety? If so, it's a candidate for the Lauer Safety Award. Was it an important component in the design of a major operational system? That would be eligible for the Williams Design Award. Did it extend the application of human factors to a new field? That's what the Kraft Innovator Award is for. Maybe the project doesn't meet any of the preceding criteria, but is yet another example of the truly excellent work this person produces consistently. If so, isn't it about time he or she was nominated for Fellow? And, if your colleague happens to live outside the U.S., perhaps you're familiar with a future Distinguished International Colleague Award winner.

You needn't wait until the *Bulletin* prompts you to start preparing a nomination package. The documentation requirements for Fellows and award nominations are quite consistent from year to year, so a package prepared according to last year's instructions will probably be usable as-is when the next call goes out. If changes are needed, they're apt to be minor. Meanwhile you'll have plenty of time to polish the package and maximize the chances of a win.

Now I'm going to share a few not-so-secret secrets with you. First, you don't have to know your candidate intimately to prepare the nomination package by yourself. In fact it's rare for a nominator to work alone—candidates almost always participate actively by providing and even writing material, so don't be shy. Your candidate will most likely be flattered and happy to assist.

Second, you can be your own candidate. Admittedly this is not as satisfying as having someone else nominate you unbidden, but many Fellows and award winners either recruited someone to serve as their nominator or even nominated themselves. And if you deserve it, why shouldn't you do the same?

Third, it's difficult to be objective about a nomination package one prepares oneself, so it's a good idea to have the package reviewed by a third party before submitting it. A former member or chair of the committee you'll be submitting the package to is ideal for this purpose. These people have vetted many packages before and should have a good idea of what it takes to be selected. The current chair should be able to give you names of recent retirees.

Another point should go without saying, but unfortunately doesn't: Follow the instructions for preparing the nomination package. The requirements for our Fellows nominations are especially well documented, and failure to heed them can cost your candidate a year.

Finally, don't be discouraged if your nomination isn't successful the first time around. It's not unusual for award nominations to cycle several times before they succeed. Seek feedback from the committee chair and determine whether there are reparable weaknesses in the package. If so, fix them and try again next year. Once the chair realizes you are genuinely interested in constructive assistance, and are not simply phoning to complain, you'll most likely get useful feedback that will increase your chance of success next time.

I can tell you from personal experience that it's enormously satisfying to see a candidate one has nominated succeed. And I think most recipients would agree that an HFES award makes The Perfect Gift. ☒



Bulletin

Volume 45, Number 4

April 2002

The *HFES Bulletin* (ISSN 1527-3660) is published monthly by the Human Factors and Ergonomics Society, 1124 Montana Ave., Suite B, Santa Monica, CA 90403 USA, <http://hfes.org>. Address inquiries and address changes to HFES, P.O. Box 1369, Santa Monica, CA 90406-1369 USA, 310/394-1811, fax 310/394-2410.

Copyright © 2002 by the Human Factors and Ergonomics Society. Printed in the USA. The *HFES Bulletin* is provided to members of the Society (\$10 of annual dues covers member subscriptions); nonmembers may subscribe for \$40/year. Periodicals postage paid at Santa Monica, CA, and additional mailing offices. USPS #018-206.

IN THE TRADES

Ginger Watson was featured in the April issue of *Discover*. An article in the magazine's High Technology section described Watson's work as director of the Human Factors Laboratory at the National Advanced Driving Simulator at the University of Iowa. View the article on line at http://www.discover.com/current_issue/index.html. ☒

Call for Student Volunteers

The Host Committee for the HFES 46th Annual Meeting, to be held September 30–October 4, in Baltimore, Maryland, invites full-time students to serve as student volunteers. Student volunteers perform many essential functions and help to ensure that the annual meeting runs smoothly. You need not be an HFES Student Affiliate member to volunteer.

Help is needed in the following key areas: **technical sessions** (99 concurrent sessions on October 1–4), **workshops and seminars** (September 30 only), the **HFES Placement Service** (September 30–October 3), the **registration desk** (September 30–October 4), **daily on-site newsletter** (October 1–3), **technical tours** (October 1–3), **information services** (throughout the week), and **poster sessions** (October 1–4).

You may request assignments in specific areas, and every effort will be made to ensure you receive your first or second choice. About 80 student volunteers are needed. A limited number of reduced-rate hotel rooms will be available, so early student volunteer signups and annual meeting registration are strongly encouraged. (The early registration deadline is August 30.) Volunteer slots are limited and will be accepted on a first-come, first-served basis. Assignments will be made and instructions sent prior to the meeting. A student volunteers room will be available at the headquarters hotel for checking in for assignments, networking with other students, and obtaining signatures for completed work.

Students who volunteer for eight hours will receive a reimbursement of the full registration fee, and those who volunteer for four hours will be reimbursed half the registration fee. (Refunds are processed after the meeting.) To volunteer, please send the following information to the address below: (a) complete contact information, including e-mail address; (b) your department, university, and current course load (must be full-time according to your university's definition); (c) your first, second, and third choices from the list of key areas given above; and (d) anticipated date of arrival at the meeting. Address requests to Director of Member Services Carlos de Falla, HFES, P.O. Box 1369, Santa Monica, CA 90406-1369 USA; 310/394-1811, fax 310/394-2410, carlos@hfes.org.

HFES Placement Service

The HFES Placement Service is the only service of its kind that caters exclusively to human factors/ergonomics professionals, with easy-to-use features for both employers and job seekers.

Employers

To recruit top human factors/ergonomics professionals, visit our Web site at <http://hfes.org> or go directly to <http://hfes.job-controlcenter.com> and post a job, search the résumés, or do both. Candidates searching the database can send their résumés directly to your desktop.

Candidates

This service is free to job seekers! Post your résumé at <http://hfes.org> and search our database of available jobs. If you

see a job posting that interests you, you can e-mail your résumé directly to the employer. If you prefer to remain anonymous, the "Confidential" selection protects your identity until you choose to become known to the employer.

Annual Meeting On-Site Placement Center

At each HFES Annual Meeting, the Placement Service provides an outstanding opportunity for employers and job seekers to meet in an informal setting or in prearranged interviews.

Employers subscribing to the HFES On-Line Placement Service may reserve space at the On-Site Placement Center for up to four days of interviews. Computers are made available for employers and candidates to perform searches on the HFES Web site.

For more information about the HFES Placement Service, call 310/394-1811 or e-mail carlos@hfes.org. ☒

STUDENT NEWS

Call for Student Award Applications

By D. Kristen Gilbert, Student Affairs Chair

The Student Affairs Committee is pleased to have an opportunity for the fourth consecutive year to recognize and publicize the accomplishments of our students. The student members of HFES are a tremendous asset to the Society. We are fortunate to have such talented, upcoming professionals as colleagues.

In order to apply for these awards, students and/or chapters must send a completed application and supporting materials (four copies) to the address listed at the end of this article (see next page).

Student Member with Honors

The purpose of this designation is to honor students who have made an outstanding contribution to the discipline or HFES during their tenure as a student. Four distinguished students, **Selma N. de Ridder**, **Ameersing Luximon**, **Karen R. Young**, and **Jiun-Yin Jian**, received this designation at the 2001 Annual Meeting in Minneapolis. Students may apply for this designation when they apply for membership in HFES, or they may send an application when they have met the following eligibility requirements:

- Class standing of junior or senior for an undergraduate, or any graduate student
- GPA of 3.75 or its equivalent for graduate students (as evidenced by a transcript)
- GPA of 3.50 or its equivalent for undergraduate students (as evidenced by a transcript)
- Student membership in HFES, or application pending

EID Special Issue

The current issue of *Ergonomics in Design* focuses on human factors/ergonomics (HF/E) contributions to homeland security. Issues were mailed to members in March, and additional copies were printed for outreach purposes.

One use to which the special *EID* issue will be put is for a media campaign organized by the HFES Outreach Advisory Committee and implemented by staff and the HFES public relations contractor, Young Communications Group. The topic will be covered in press releases to the print and broadcast media with the aim of reaching government and business leaders about the value of the field.

As stated in the lead article in that issue, by P. A. Hancock and S. G. Hart, "Readers are encouraged to use this article [and the entire issue] to further the knowledge and awareness of business and government leaders about what HF/E can contribute not only to counterterrorism efforts but also to the general improvement of human-machine systems of all kinds." The Hancock/Hart feature will also be available in PDF format at the HFES Web site.

To assist the outreach effort, HFES members are asked to send names of business and government leaders with an interest in the counterterrorism topic to Communications Director Lois Smith (lois@hfes.org, fax 310/394-2410). Please provide the mailing address of each contact and his or her affiliation or job title, and specify if you would like your name to be referenced in the correspondence that accompanies the magazine. ☒

ADL and the AFRL (continued from page 1)

- *Durability* – instructional components do not require redesign or recoding to operate when base technology changes.
- *Reusability* – the design of instructional components so that they can be incorporated into multiple applications.
- *Cost-effectiveness* – significantly increase learning effectiveness while reducing time and costs.

ADL Organization

The ADL initiative comprises three co-laboratories. The co-lab in Alexandria, Virginia, serves as the central executive agency and strives to develop hardware and software standards that promote reusable courseware. The Joint ADL Co-Lab in Orlando, Florida, promotes collaborative development of ADL prototypes and ADL systems acquisitions, principally among DoD components. The Academic ADL Co-Lab at the University of Wisconsin, Madison, serves as an academic demonstration site for ADL tools and content, including those developed by the federal government, academia, and industry.

Of particular interest is the Joint ADL Co-Lab, whose members represent a cross section of DoD and other federal agencies, with strong scientific support from the Air Force, Navy, and Army. The lab has sponsored a number of prototypes that demonstrate the power of combining standards-based reusable courseware objects with cutting-edge intelligent instructional

- Successful completion of at least one human factors-related course with a grade of A or its equivalent (as evidenced by a transcript or letter from the instructor)
- Two letters of recommendation, at least one of which must be from a full Member of HFES
- At least two of the following:
 1. A human factors-related presentation at a regional or national meeting (provide photocopy from program or letter from adviser)
 2. Evidence of design contribution (e.g., award, patent, letter from supervisor)
 3. Publication of human factors work in an approved journal (e.g., *Human Factors*, *Ergonomics in Design*, *Applied Ergonomics*, or any other journal approved by the awards committee)
 4. Significant service to HFES at the national or local chapter level (provide letter from committee chair or officer of the group)

Outstanding Student Chapter Awards

The purpose of this award is to honor student chapters that have made an outstanding contribution to the discipline, HFES, their campus, or their community in a particular year. Up to three student chapters may be honored each year. Two exemplary student chapters were chosen to receive the award in 2001: **Virginia Polytechnic Institute and State University** and **Georgia Institute of Technology**.

Examples of outstanding contributions include:

- Significant increase in percentage of membership in the student chapter or numerous chapter activities, such as colloquia and field trips
- Service to the community, such as sponsoring a design competition at a local high school or involvement in a career day
- Participating in a design competition, developing a product, or conducting a research project
- Service to HFES at the national or local chapter level
- Notable electronic presence (e.g., innovative use of a Web site)

In order to apply for these awards, chapters must provide supporting materials (four copies), including letters of recommendation, a written description of the activities of the student chapter, and other materials that will support the application, such as brochures, announcements, and videos.

The deadline for applications is *June 3, 2002*.

For further information or to request an application for Student Member with Honors and/or Outstanding Student Chapter, contact Kristen Gilbert, University of Montevallo, Station 6440, Montevallo, AL 35115; 205/665-6445; gilbertk@montevallo.edu. ☒



Figure 2: Synthetic MicroWorld representation of an entire theater of battle.

methods. Representative of this approach is the ongoing effort of the Information Systems Training Branch (HEAI) of the Air Force Research Laboratory (AFRL) at Brooks Air Force Base, San Antonio, Texas.

AFRL's Contributions

The HEAI branch of the Air Force Research Laboratory Human (consisting of the Effectiveness Directorate Warfighter Training Division and Information Systems Training Branch) is an official member of the Joint ADL Co-Lab. Ongoing research at HEAI focuses on distributed and collaborative research in individual, team, and interteam instruction. Formally, HEAI's mission is to provide AFRL representation to the Joint Co-Lab, participate in the ADL Senior Advisory Committee, identify ADL requirements, and provide technical expertise. Further, HEAI provides a unique laboratory environment for the test and evaluation of emerging ADL technologies. The lab is unique in that researchers have access to professional warfighters with operational experience. This allows for the validation of training systems and approaches that would not otherwise be available to academia and industry.

We designed and delivered to the Pentagon an innovative ADL prototype product that supports collaborative and distributed crisis action planning; currently we are developing and validating ADL SCORM-compliant courseware for Air University at Maxwell Air Force Base in Alabama. Our long-range vision is to drive the ADL community toward pedagogically principled operational training for teams and team-of-teams in Synthetic MicroWorlds.

Synthetic MicroWorlds are complex training and rehearsal environments that represent the interactions among several simultaneous subtasks. For example, a MicroWorld composed of unmanned air vehicles (UAVs), an Airborne Warning and Control System (AWACS), a command and control cell, and fighter aircraft could simulate a coordinated air strike. The primary challenge for Synthetic MicroWorlds is to capture the cognitive and conceptual elements of the tasks. The goal is for operators training within these environments to be processing information and making decisions in the same manner as in real-world tasks. Thus, Synthetic MicroWorlds emphasize cognitive fidelity as compared with physical fidelity.

Much of the work being done in the ADL community is in the area of on-line courseware. Often this means little more than computer-based "page turners." Such efforts can be cost-effective

compared with distribution of hard-copy documents, but the result often has limited utility for developing deep conceptual knowledge. AFRL develops Internet-distributed, cognitively based intelligent tutoring systems that tailor training to the individual by incorporating cognitive modeling, expert systems, and synthetic agent technology. In addition, we are expanding ADL beyond the current focus on declarative knowledge to include procedural knowledge, complex skill development, and team performance.

In a proof-of-concept demonstration, AFRL completed and delivered an Internet-based performance support aid for crisis action planning. Crisis action planning involves monitoring world situations and pulling together disparate pieces of information to generate documents for implementing an action plan for intervention in various crises. Writing a crisis action plan (CAP) is the preliminary step in a wide variety of military operations including humanitarian aid and peacekeeping. Rapid response to terrorist activity, both at home and abroad, is also preceded by developing a CAP.

AFRL/HEAI teamed with Galaxy Scientific Corporation to develop the Crisis Action Planning Tutor and On-line Resource (CAPTOR) training system. This SCORM-compliant training system delivers instruction on the crisis action planning process and also supports the creation of a complete crisis action plan. The training system is distributed over the Internet, runs in standard Web browsers, and supports real-time collaboration in the development of a crisis action plan. The system provides tools for viewing current events in real time, setting goals, reviewing past steps taken, developing alternative plans, and keeping notes on current progress.

Moreover, AFRL is developing SCORM-compliant courseware for the Air University. The goals of this effort are to design and implement courseware for courses to be used in Reserve Officers Training Corps, Officers Training School, Basic Officer Training, and Commissioned Officer Training. The courses are being developed for delivery on both CD-ROM and the Web and utilize intelligent pedagogy and embedded performance measures to tailor training to individual needs and abilities. After the courseware is delivered, empirical test and evaluation will follow shortly thereafter.

The Future of ADL

The future training potential of ADL is unlimited. As technology and bandwidth capabilities continue to grow exponentially, ADL standards will adjust accordingly. Further, the range of content domains and knowledge and skill types that can be effectively and efficiently taught with ADL will also increase. In the not-too-distant future, fully immersive virtual reality MicroWorlds may be the medium of choice for teaching complex, highly skilled tasks. Again, although the Internet is the means by which ADL's training can be delivered worldwide, human factors/ergonomics professionals must ensure that the content of the training is effective and useful.

Barry P. Goettl is a research psychologist for the Air Force Research Laboratory at Brooks Air Force Base. He has published research papers on skill acquisition, team performance, training, computer-based training, tracking and motor control, attention and workload, and visual displays. Alan Ashworth is director of the Advance Distributed Learning (ADL) Initiative at the U.S. Air Force Research Laboratory and an adjunct professor of psychology at the University of Texas at San Antonio. Ashworth has published in the areas of mnemonic representation, categorization, human learning, and imagery chronometrics.

Directory & Yearbook Coming

The HFES 2002–2003 *Directory & Yearbook* was mailed to all members in good standing this month. Additional copies are available to members for \$25 per copy plus \$7 shipping/handling (\$15 outside the U.S.).

Every effort is made to ensure that member listings are correct. Errors should be reported to the HFES Member Services Department (310/394-1811, stefanie@hfes.org). Members may also submit changes to their contact information via the HFES Web site (<http://hfes.org>) using the on-line update form. The information at the on-line member directory is updated twice a month.

2002 Graduate Program Directory

During April the revised version of the HFES *Directory of Human Factors/Ergonomics Graduate Programs in North America* will be posted at the HFES Web site. The 2002 edition will be easier to use; rather than one large PDF file, the directory will consist of a table of contents with links to each individual program (HTML format). This also permits HFES staff to make more frequent updates to program information as they become available.

If you are aware of additional programs not included in the revised graduate directory, please send details to Editorial Assistant Alexandra Sartor (alex@hfes.org, 310/394-1811).

Member Benefits Reminder

The HFES Membership Services Department would like to remind you of the following member benefits. Use your HFES member ID number (which is found on your member ID card or the mailing label on your publications) when placing your order with these providers:

15% discount on books and 20% off journals from Lawrence Erlbaum Associates. LEA offers a wide range of human factors/ergonomics titles in areas including transportation, cognition, performance, and HCI. Call 800/926-6579, order via e-mail at orders@erlbaum.com or journals@erlbaum.com, or visit the LEA Web site at <http://www.erlbaum.com>.

15% discount on books and resources offered by John Wiley & Sons. Wiley offers a number of books in simulation, accident investigation, manufacturing, and other HF/E topics. After January 1, call Wiley toll-free at 800/225-5945, extension 2463, and refer to promotion number 9-4383.

15% discount on books from Taylor & Francis. This publisher has served the HF/E community for more than 40 years with books and journals for researchers, practitioners, and students. As a member of a society affiliated with the International Ergonomics Association, you are entitled to the IEA discount on journals as well. Visit them at <http://www.taylorandfrancis.com>.

15% discount on selected titles from Academic Press. Nine HF/E books are offered. Order by phone 800/321-5068; fax 800/637-8727; or e-mail ap@acad.com. Be sure to specify the following HFES member discount code: DM 54797.

20% discount on products from the Human Systems Information Analysis Center (HSIAC). Choose from software, human workload assessment tools like NASA-TLX and SWAT, observational data analysis tools like A.C.T. and MacSHAPA, reference materials like CDRL Maker and SPEC Maker, and publications in a number of categories, including cognition and decision making, control display design, and human performance. Call 937/255-4842 or visit the HSIAC Web site at <http://iac.dtic.mil/hsiac/products>.

Discounts on car rental from Hertz and Alamo. Enclosed with your renewal confirmation and membership card are special HFES member coupons with details about how you can take advantage of your rental discount. ☒

IN THE NEWS

A recent New York Times article (March 12, Health and Fitness) entitled “Vital Signs: Prevention; Benefits of Being Ergonomically Correct” featured research published in the *Proceedings of the Human Factors and Ergonomics Society 45th Annual Meeting*. The research was also featured in a *San Jose Mercury News* article (March 19), “Equipment Can Ease Injuries at Computer.” The proceedings article, “Effects of an Ergonomic Intervention on Musculoskeletal Discomfort among Office Workers,” by Mary Rudakewych, Lisa Valent-Weitz, and Alan Hedge, describes a study in which 356 office workers received ergonomically designed workstations and subsequently experienced a 40% decrease in the prevalence of musculoskeletal symptoms. ☒

Bulletin

Volume 45, Number 4 April 2002

Communications Director: Lois Smith
Student News Editor: Melanie Diez
Editorial Assistant: Alexandra Sartor
Advertising: R. C. Bublitz & Associates,
818/992-0366

POSTMASTER:
Send address changes to the HFES Bulletin,
Human Factors and Ergonomics Society,
P.O. Box 1369, Santa Monica, CA 90406-1369 USA,
310/394-1811, fax 310/394-2410.

General Information: info@hfes.org
Editorial/Advertising: lois@hfes.org
Placement Service: placement@hfes.org
Annual Meeting: lois@hfes.org

Opinions expressed in BULLETIN articles are those of the authors and should not be considered as expressions of official policy by the Human Factors and Ergonomics Society.

FLASH!

ANNUAL MEETING UPDATE!

The location and dates for the
HFES 46th Annual Meeting
have changed:

**September 30–October 4,
2002, Baltimore, Maryland**

**New early registration dead-
line: August 30, 2002.**



**Human
Factors
and
Ergonomics
Society**

P.O. Box 1369
Santa Monica, CA
90406-1369 USA

PERIODICALS
POSTAGE PAID
AT
SANTA MONICA, CA
AND ADDITIONAL
OFFICES