



Ergonomics Input Leads to Design Award

With technical assistance from the Institute for Ergonomics, Fitch, a design firm based in Powell, Ohio, has won a prestigious design award.

Fitch was given a Gold Award from product design's most prestigious annual competition, IDEA 2005, sponsored by *BusinessWeek* and the Industrial Design Society of America, for its redesign of the iconic sippy cup.

The Gerber "Sippy Snacker" is an ergonomically conscious combination spill-proof cup and snack container. It was among 38 gold winners out of 1,400 entrants.



The Sippy Snacker, which hit the market in January 2005, continues to receive praise from the design community at large, and more importantly, from parents in need of life-simplifying design. The Sippy Snacker design was called "revolutionary" by *Fast Company* and one of the best ways to keep children quiet at church by *Parenting* magazine.

The Institute's **Dr. Gary Allread** worked with Fitch, providing various anthropometric characteristics of newborn children and infants and researching motor skill development and changes during the first months of life.

"In recreating this cup, we put ourselves in the place of a child. By observing children and working with The Ohio State University's Institute for Ergonomics, we saw how uncomfortable using past models of the spill-proof cups could be," Chris Von Dohlen, senior industrial designer for Fitch said. "We wanted to make holding and drinking from the cup easier for the child, and make feeding the child easier for the parent."

Aesthetics of the Sippy Snacker have been improved and simplified, and secondary research was conducted to ensure the Sippy Snacker was ergonomically sound. The 7-ounce version has a thinner neck for smaller hands to hold and is angled to prevent young children from overextending their necks while drinking. The 10-ounce version holds more liquid to meet older children's growing needs. Lids on both cups are recessed to allow room for a child's nose, so no child is forced to hold the cup at an awkward angle.

Squinting while Staring at a Computer Monitor Can Cause Painful, Dry Eyes

Squinting at a computer screen can cut in half the number of times someone blinks each minute, and that could lead to an irritating condition called dry eye, new research suggests.

The more that the participants in this study squinted their eyes, the less they blinked. The less they blinked, the more their eyes ached or burned, and the more they reported sensations of dryness, irritation and tearing.

Just a slight amount of squinting reduced blink rates by half, from 15 blinks a minute to 7.5 blinks a minute.

"People tend to squint when they read a book or a computer display, and that squinting makes the blink rate go way down," said **Dr. James Sheedy**, the study's lead author and an OSU professor of optometry. "Blinking rewets the eyes. So if your job requires a lot of reading or other visually intense work, you may be blinking far less than normal, which may cause eye strain and dry eye."



Sheedy

Squinting serves two purposes: it improves eyesight by helping to more clearly define objects that are out of focus; and it also cuts down on the brightness from sources of glare. It may be voluntary or involuntary. A person working at a computer may not realize that he is squinting.

continued on page 5

In This Issue . . .

1. *In the News* 3
2. *New Books by Institute Members* 4
3. *Publish or Perish-Recent Publications* . . 5
4. *Graduate Student News* 6
5. *Robot Competition Winner* 6

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Ergonomics Job Opportunity

Honda of America Manufacturing, Inc. (HAM) is seeking an Ergonomist to support Honda's North **HONDA** American Ergonomics/Safety improvement network in Marysville, Ohio. This position involves the following responsibilities:

- Lead the development, implementation, and revision of ergonomic guidelines, procedures, and training to support HAM and Honda North American facilities;
- Support the training of HAM and North American plants on ergonomic guidelines and evaluate adherence to those guidelines;
- Support the evaluation of new model, equipment, and process design to determine proper countermeasures for ergonomic concerns;
- Support the North American Ergonomic Committee in the evaluation of design-related concerns to develop and communicate the "Top Ten" concerns to Honda R&D - Tochigi Center (on a continuing basis);
- Continue to refine the ergonomic systems audit tool and conduct meaningful evaluations of plants' ergonomic programs; and
- Manage complex ergonomic projects.

The position requires a minimum of six years of ergonomic experience in a machine-intensive manufacturing environment. A Master of Arts or Science in Ergonomics or related field is required. A Certified Professional Ergonomist (CPE) is preferred, and ergonomic process analysis and guideline/training development for multiple worksites is desired.

The candidate must:

- Possess knowledge of ergonomic concepts and principles;
- Have the ability to develop solutions to ergonomic concerns;
- Understand and appropriately use ergonomic analysis tools and methodologies; and
- Understand how ergonomics can be integrated with production, quality, and cost issues and can be used as an effective business tool.

Interested candidates should apply online at: www.ohio.honda.apply2jobs.com. Please use source code: Internet; HFES when applying. (Job Code: ADM4843).

IN THE NEWS



Kudos to **Gary Allread**, who was granted the distinguished Certified Professional Ergonomist (CPE) credential by the Board of Certification in Professional Ergonomics, in November, 2005. BCPE is the certifying body for individuals whose education and experience indicate broad expertise in the practice of human factors/ergonomics.



Stuart Zweben, former Chair of the Department of Computer Science and Engineering, has accepted the position of Associate Dean for Academic Affairs and Administration. Stu began a half-time appointment effective January 1, 2006, and he will transition to become full-time on July 1, 2006.



Recent research by **Steve Lavender** and **Gary Allread** on airline worker musculoskeletal disorders related to baggage handling was profiled in the February 2006 issue of *The Synergist*, the publication of the American Industrial Hygiene Association. Dr. Lavender reported how alternative baggage stacking techniques in aircraft cargo holds can reduce spinal loading. Dr. Allread's work focused on assessing risk (using the Lumbar Motion Monitor) across various baggage handling activities.



The Industrial Designers Society of America (IDSA) recently inducted **Jim Kaufman**, OSU professor of industrial design and design technology, into its Academy of Fellows. The Academy of Fellows is a veritable "who's who" of industrial design. This award honors Jim's significant contributions to design education and IDSA. He chaired IDSA's Education Committee from 2001-2003 and served as chair of the Central Ohio Chapter for 2000-2001. IDSA's Board of Directors awards fellowship status to a select few individuals each year.



The Institute for Ergonomics was proud to once again be an academic co-sponsor of the Applied Ergonomics Conference. This conference provides a forum for ergonomics practitioners to discuss and learn about tools and practical applications for solving ergonomics issues.

The 2006 conference was held March 6th-9th, in Orlando, FL. More information about this conference is available at www.appliedergo.org/conference.

2006 Ergonomics Short Course Dates Announced

The 2006 training schedule has been set for *Putting Ergonomics Into Practice*, the Ergonomics Short Course held twice annually on The Ohio State University's main campus. This comprehensive course, which teaches a systematic approach to integrating ergonomics principles into the workings of an organization, will be held:

May 2nd - 5th, 2006

October 10th - 13th, 2006

More details are available on the Institute web site, <http://ergonomics.osu.edu/>.



New Books Written by Institute Members Cover Broad Range of Ergonomics Topics

For Resilience Engineering, ‘failure’ is the result of the adaptations necessary to cope with the complexity of the real world, rather than a breakdown or malfunction. The performance of individuals and organizations must continually adjust to current conditions and, because resources and time are finite, such adjustments are always approximate.

The book *Resilience Engineering: Concepts and Precepts*, edited by Erik Hollnagel (École des Mines de Paris, France, and Linköping University, Sweden), **David D. Woods** (The Ohio State University), and Nancy Leveson (Massachusetts Institute of Technology), became available in February 2006.

This definitive new book explores this groundbreaking new development in safety and risk management, where ‘success’ is based on the ability of organizations, groups and individuals to anticipate the changing shape of risk before failures and harm occur.

Featuring contributions from many of the world’s leading figures in the fields of human factors and safety, *Resilience Engineering* provides thought-provoking insights into system safety as an aggregate of its various components, sub-systems, software, organizations, human behaviors, and the way in which they interact.

This book provides an introduction to Resilience Engineering of systems, covering both theoretical and practical aspects. It is written for those responsible for system safety on managerial or operational levels alike, including safety managers and engineers (line and maintenance), security experts, risk and safety consultants, human factors professionals and accident investigators.

Resilience Engineering: Concepts and Precepts, a 410-page book, is available for \$99.95.

Visit www.ashgate.com for more information.



“This is the most thought-provoking collection of papers I’ve read in a very long time. They are written by the best in the field at the top of their form. Resilience is a notion whose time has come. We cannot realistically expect to eliminate adverse events and still stay in business. But we can strive to achieve greater robustness towards our operational hazards. This book tells us how to do it and why it’s necessary.”

James Reason

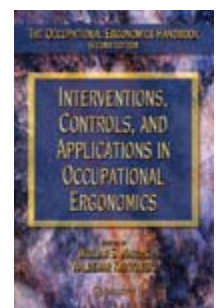
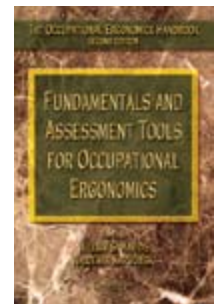
Completely revised and updated, taking scientific rigor to a whole new level, the second edition of *The Occupational Ergonomics Handbook* is now available in two volumes, from Taylor & Francis CRC Press (www.crcpress.com).

Edited by **William S. Marras** (Co-Director of the Institute for Ergonomics) and Waldemar Karwowski (University of Louisville), this *Handbook* demonstrates the enormous advances that have occurred in the field since publication of the first edition in 1999. The second edition provides more information and makes it more accessible.

Each volume narrows the focus while broadening coverage. One of the most comprehensive sources for ergonomic knowledge available, written by leading experts who provide both sound theory and practical examples, this book is a valuable resource for anyone in the field.

Fundamentals and Assessment Tools for Occupational Ergonomics (1,024 pages; \$129.95) merges the frontiers of ergonomics, workplace design, and management issues. The editors have brought together researchers from disciplines such as biomechanics, anthropometry, and cognitive science with pioneering practitioners in industry. They discuss tools of the trade, upper extremity analysis, backs, interventions, management issues, design for ergonomics, principles of product design, band-aid approaches, processing, distribution centers, and service systems. The *Handbook* is a compendium of information authored by top-flight investigators who represent the cutting edge of opinion, research, and interest in the field.

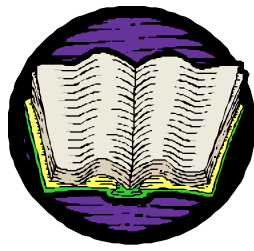
Interventions, Controls, and Applications in Occupational Ergonomics (848 pages; \$129.95) describes elements of the ergonomics process and includes success factors for implementing such processes. It covers injury surveillance database systems and health management for the design and evaluation of health in industrial organizations, human digital modeling, facilities planning, organizational design, and macro-ergonomics. Additional chapters present methods and techniques for engineering controls, including tried-and-true strategies, as well as discussions of the theory and practice of ergonomics interventions in the workplace.



PUBLISH

or perish

Recent publications written by Institute members (indicated in boldface font) include:



Etiology of Work-Related Disorders of the Rotator Cuff Tendons: Research and Theory

Carolyn M. Sommerich and R.E. Hughes, *Theoretical Issues in Ergonomic Science*, 7(1):19-38, 2006.



Biomechanical Modeling

William S. Marras and R. G. Radwin, in R.S. Nickerson (ed.), *Reviews of Human Factors and Ergonomics, Volume 1*, Human Factors & Ergonomics Society: Santa Monica, CA, 2006.



General Ergonomics Principles

Carolyn M. Sommerich, in J. Anshel (ed.), *Visual Ergonomics Handbook*, CRC Handbook: Boca Raton, FL, 2005.



Dry Eyes - continued from page 1

Dry eye is usually treatable with over-the-counter eye drops. It's rarely a debilitating condition, but it can be irritating and painful.

The results appear in a recent issue of the journal *Optometry and Vision Science*. Sheedy conducted the study with Ohio State colleagues Sowjanya Gowrisankaran, a graduate student, and John Hayes, a research scientist in optometry.

The researchers asked ten college students to squint at different levels. All participants had 20/20 vision in both eyes. The researchers attached two tiny electrodes to the lower eyelids of each student. The electrodes were also attached to an electromyogram, a machine that records the electrical activity of muscles. In this case, the researchers wanted to record the action of the orbicularis oculi muscle, which encircles the eye socket and allows the eye to both blink and squint. The electromyogram measured the different degrees of squint.

The researchers also videotaped the blinking students. Participants were situated in a chin and forehead rest—doing so let them relax their head and neck while squinting at the various levels. Subjects were asked to look directly at a computer screen situated about two feet in front of their eyes.

The researchers recorded data from five trials. For the first trial, participants were asked to completely relax their eyes. For the next four trials, students squinted in increments ranging from 5% (barely squinting) to 50% (eyes closed about half-way.)

Participants were also instructed to continuously look

at a black dot in the center of a computer display. They listened to music while a changing pattern, which was driven by the music, moved around the black dot.

At the end of the trials, the researchers watched the videotapes and counted the number of times each student had blinked during the trials.

Blink rates decreased from an average of 15 blinks per minute when the eyes were relaxed to 7.5 blinks a minute when students squinted just 5%. That number was reduced to four blinks a minute when participants squinted at the 50% level.

Sheedy said that the next step is to figure out the physiological mechanisms behind eye strain and dry eye.

“The neural pathways leading to eyelid blink aren't completely understood,” he said. “And the mechanisms controlling blink seem numerous and complex.”

This study was supported by a grant from Microsoft Corp. Neither Sheedy nor his co-authors have ties to Microsoft beyond the scope of this study.

More for information, contact James Sheedy, (614-247-7632 or JSheedy@optometry.osu.edu).

Article written by Holly Wagner (614-292-8310; wagner.235@osu.edu).



Graduate Student News

New Student

Shilo Anders

(anders.41@osu.edu)

Advisors: David Woods,

Emily Patterson

Hometown: Seeley Lake, Montana



Shilo currently is working on her PhD. She received a Masters degree from the University of Dayton, in Experimental/Human Factors Psychology. Her research interests involve the application of human factors to memory, decision making strategies, and problem solving, to improve human performance interactions with technology. Welcome, Shiloh!

Voshell Wins Robot Competition

Congratulations to **Martin Voshell**, who won a search-and-rescue robot competition during his visit with the Man-Machine Interaction (MMI) Group at the Delft University of Technology, Netherlands.

Martin developed a new interface concept between two parties called “Coordinating Shared Perspectives.” His robot and human-robot coordination mechanism was entered into a USAR robot competition.

In the competition, each robot was operated by a handler and a navigator. The handler controlled the platform in a separate room from the actual exploration, and the navigator was responsible to help the handler locate victims and hazards and build a map of the explored space. This served as first test of the coordinated perspectives interface.

In this case, the handler and the navigator were located on different continents (Europe and North America). The navigator (in New York) shared a real-time video feed with the handler (in Delft). To achieve common ground in the activity, the setup enabled the handler to point at objects from the robot’s video feed, and the navigator could see the handler and what was being pointed at. The two communicated using an encrypted voice connection.

This assignment was to establish collaboration in research and expertise between Ohio State’s Cognitive



Voshell

Systems Engineering Laboratory (cse1.eng.ohio-state.edu) and the the MMI group, through Voshell and Dr. A.H.J. (Stijn) Oomes.

With C/S/E/L's background in human-robot assisted search and rescue and MMI's involvement in the crisis and response management community, they were able to set up ties directly with the Netherlands USAR team, who function as a valuable resource to continue this work.

The tele-operated robotic platform built for the competition was a proof of concept that is under continued development within C/S/E/L's Human Robot Coordination Community and the interface. Initial findings are currently under review to be published for the 2006 conference on Information Systems for Crisis Response and Management (ISCRAM).

Martin Voshell’s graduate advisor is Dr. David Woods. Martin can be reached at voshell.2@osu.edu.

