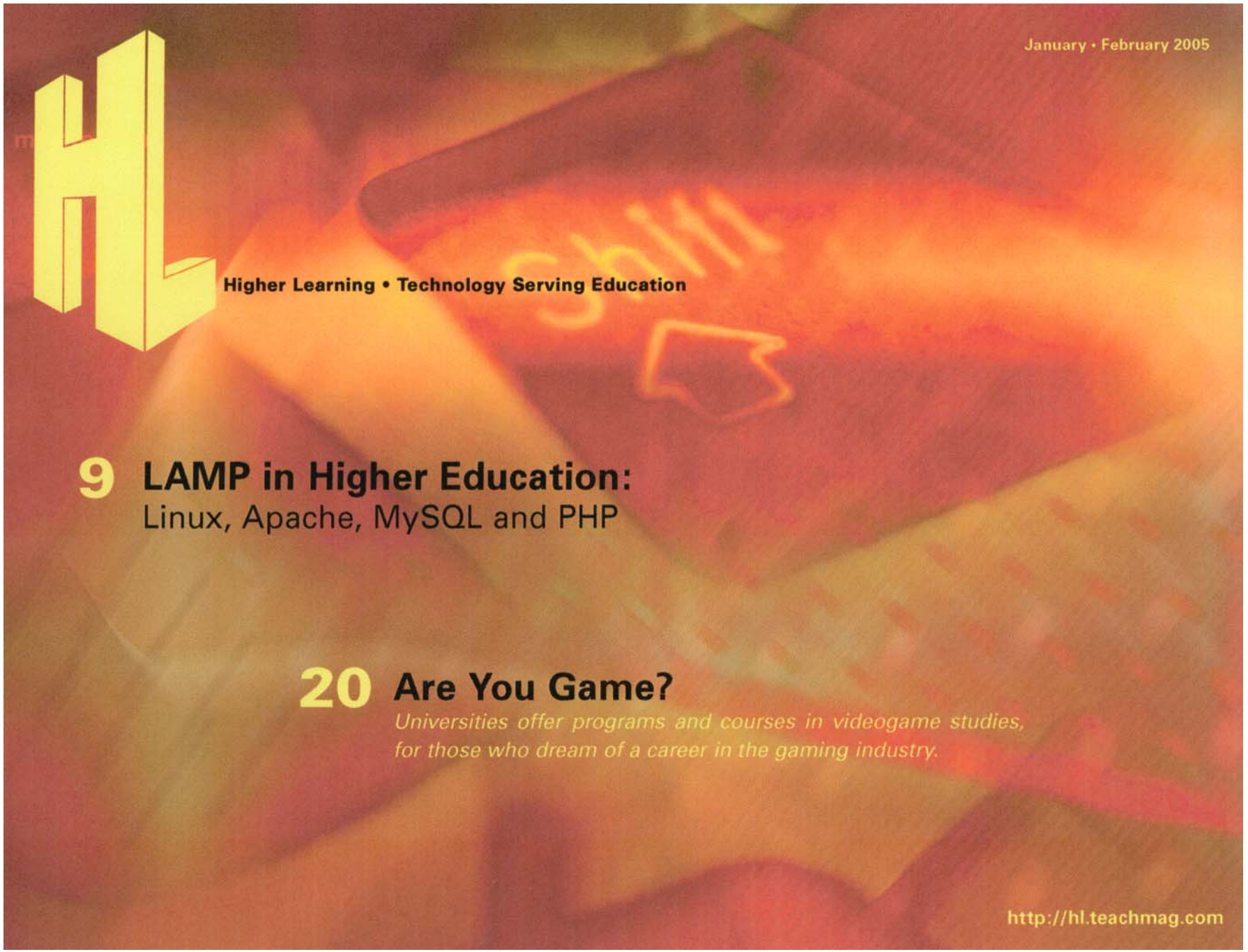
January • February 2005
Higher Learning • Technology Serving Education
9 LAMP in Higher Education:
Linux, Apache, MySQL and PHP
20 Are You Game?
Universities offer programs and courses in videogame studies,
for those who dream of a career in the gaming industry.
http://hl.teachmag.com

Intelligent clothing inspired by pinecones

"Smart" clothing, which adapts to changing temperatures to keep the wearer comfortable, is being developed by two universities, who are using nature as their guide.

The clothing will use the latest in micro technology to produce material that lets in air to cool a wearer when it's hot and shuts out air when it's cold. This is similar to a system used by pinecones to open up and emit seeds.

The University of Bath and the London College of Fashion are jointly researching the material, which they think could be in everyday use by people within a few years. The project has been chosen as one of eight to represent U.K. science at the Expo 2005 in Japan from March to September, whose theme is Nature's Wisdom.

The smart garments will consist of a top layer of tiny spikes and water-absorbent material, possibly wool, each only 1/200 mm wide. When the wearer gets hot and sweats, the tiny spikes will react to the moisture and automatically open up so air from the outside can get through the material and cool the wearer. When the wearer stops sweating, the spikes close down again to stop air getting in. The lower layer will be made of non-porous material, so rain can't get through, whether the spikes open or not.

The technology for the material is being designed by the University of Bath's Centre for Biomimetics, which takes ideas from nature and turns them into technological advances. The design for the clothing is being carried out by Veronika Kapsali, who is studying for her PhD in design at the London College of Fashion, part of the University of Arts London. It's up to her to make something that's "cool-looking" as well as innovative.

The material could have a wide variety of applications and could be used for coats, hats, gloves, shirts, pants, dresses and skirts. For more information, visit ***www.bath.ac.uk***.

Music machines

By Rosemary Covert

In the fall of 2004, at the University of Ottawa (U of O), a one-of-a-kind research laboratory began to work on one of music's oldest unanswered questions – how do novice students learn to play the piano?

The U of O's Gilles Comeau's Piano Pedagogy Research Laboratory (***www.piano.uottawa.ca***), built with a $1.2-million grant from the Canada Foundation for Innovation, the Ontario Innovation Trust, the University of Ottawa and various private-sector partners, combines a traditional piano studio with state-of-the-art technology to provide a controlled environment for scientific research in a field sorely lacking in scientific data. Its sophisticated equipment, which includes two Disklaviers that can encode the details (such as pitch, key pressure and duration) of a player's performance, a complete recording studio and leading-edge audio-visual technology, will allow researchers to create hard data about the process of teaching and learning piano.

Various video cameras in the lab can be trained on the student's whole body or on his or her fingers, hands, arms, shoulders or back. At any time, the student can check body and hand positions on one of five 40" plasma TV screens around the room and an instant replay function allows both teacher and student to immediately review the lesson segment just covered.

Every room in the lab is set up for broadband videoconferencing, making it possible to teach long-distance group and master classes. Already, a U of O graduate student is teaching 5-to-6-year-old Inuit children in Kangiqsualujjuaq, Quebec a weekly group lesson in the rudiments of keyboard playing. And, when Comeau teaches his master class for students in Finland, the sounds he plays on his Disklavier in Ottawa are converted to MIDI files transferred via an ISDN connection to the Disklavier in the Finnish classroom, eliminating the sound distortion normally occuring in a long-distance audiovisual connection.

Comeau, the director of the laboratory, has put together a broad, internationally based research team of specialists in music, psychology, cognitive sciences, information technology, health sciences and engineering to study such diverse aspects of piano pedagogy as how novice students master playing skills, what the best approaches to teach music reading are and how to develop a kinesthetic awareness of piano technique. The data the lab will generate may help lower the piano-student dropout rate and reduce incidents of playing-related stress injuries

by identifying the most effective strategies for use in the early stages of learning to play.

Piano teachers have always relied on a long tradition that has very little scientific research backing it up. Traditional teaching techniques are often valuable, but technology can now provide a scientific basis for the art of teaching. Researchers will be able to study the impact of teaching on student learning, the effectiveness of different teaching approaches and the results of different methods used to train piano teachers.

This fall, the U of O Music Department registered the first students of its new piano pedagogy program, which can lead to a one-year Graduate Certificate in Piano Pedagogy Research or a two-year Master of Music degree with a thesis in piano pedagogy. It is one of few North American programs that place major focus on producing researchers trained to bring scientific methods to the study of piano pedagogy. All students in the program are required to complete a year-long practicum, in which they work with a multidisciplinary research team on a specific project, and all master's students have access to the lab to conduct their own research projects.

Rosemary Covert is a freelance translator, editor and writer based in Ottawa, Ontario.

Backseat-driver robot doesn't miss a thing

A new electronic "backseat driver" may soon be ensuring you notice speed limit signs and slow down as necessary. It will even let you know if it appears you failed to see a sign.

The latest "big-brother aid" for motorists combines two technologies developed by the Australian National University's Systems Engineering Department and its startup company, Seeing Machines.

The system uses a set of three cameras that pick out road signs while another pair of cameras monitor where the driver is looking. When the system has matched the image at the roadside with the signs stored in its memory, it checks whether the driver looked in the direction of the sign. If the sign indicates a speed restriction, the system checks to see whether the car is traveling within the limit.

Multimedia man

By Patricia Mroczek

In a tech world where "multimedia" is now a chorus, Peter Stanchev has been tapped to help with the harmony. Kettering University's associate professor of computer science recently returned from teaching tutorials in Spain and Hawaii on the world's most current digital audiovisual compression standards: the MPEG 7.

His qualifications as a multimedia tutor are superb. It was Stanchev's Italian colleague, Dionysios Tsichritzis, who originally coined the phrase "multimedia" almost two decades ago. Multimedia was cutting-edge then; a new technology that placed entire movies or music albums on a small compact disc (CD). "Nineteen years ago, very few people were working in this area," Stanchev says. "I worked in the first European project where multimedia was introduced."

He also was around in 1988, when the International Standards Organization formed the Motion Picture Experts Group (MPEG) to develop coding techniques to achieve good quality audio and video. MPEG 1 and MPEG 2 introduced and upgraded CD movies and musical options. Stanchev and Fausto Rabitti co-authored the first image semantic model, which aided the experts in downloading and delivering the Hollywood classics on tiny pieces of plastic.

So, it's not surprising this expert, who maintains faculty offices in Italy, Bulgaria, and at Kettering in Flint, MI, was the specialist selected to teach the presentation on the "next generation" of multimedia: MPEG-7.

Stanchev was featured at the Fourth Annual International Association of Science and