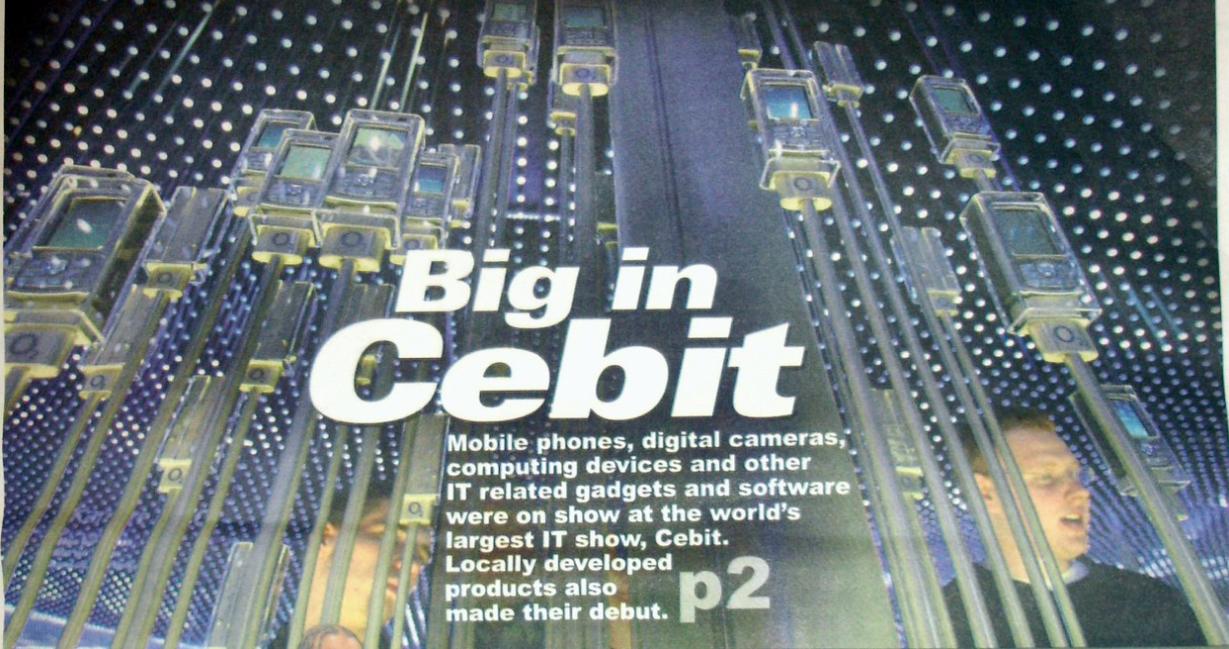


Digital Life

Music phone
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Big in Cebit

Mobile phones, digital cameras, computing devices and other IT related gadgets and software were on show at the world's largest IT show, Cebit. Locally developed products also made their debut. **p2**

PLUS

NUS Arts Festival uses technology in its performances **p6**



Hungry? Check out this website **p16**



How to make better home movies **p20**



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✚Digital Life

Art, technology fuse on stage

Interactive digital media and artists interact at the NUS Arts Festival's techno arts section. LESLIE GOH tunes in



In video artist Choy Ka Fai's *Drift Net*, muscle sensors strapped to a dancer are fed via Bluetooth into custom-written software to generate the effects on stage. -- PHOTO: THEATREWORKS

Imagine a musician strumming his sitar. As he plays, his sitar sends signals to a robotic drum, which then accompanies him by pounding a drum beat.

Then a second drum stirs, and a third, and a fourth, until four drums and a musician bring out intriguing sitar-drum harmony.

Picture, too, a pianist at her keyboard, playing notes which a software program intercepts to feed into a visual display of a mathematical spiral. The spiral rotates and highlights notes and keys which the musician is playing, helping listeners to visualise the movement of a melody.

This is what took place at the techno arts programme within the NUS (National University of Singapore) Arts Festival. The festival, which began on March 2, runs until March 25. The techno arts component runs from March 8 to the end of the main fest.

For the first time in an arts festival here, with digital media going interactive, artists have the opportunity not only of weaving it into their works, but also of interacting with or responding to it. That is interactive digital media (IDM) at work.

Apart from the arts, the director of the NUS Centre for Management of Science and Technology, Dr C.C. Hang sees huge potential in IDM in education.

Dr Hang explained that new teaching methodologies have to be developed for today's multi-tasking youngsters. 'They listen to their iPods, write e-mail and talk to their friends on MSN Messenger (all at once).' The concern is that when they enter university, classes will 'fail to engage our current young generation'.

One of the methodologies that Dr Hang's Steering Committee for IDM in NUS is exploring is using video games in teaching.

Which is why he is looking across disciplines to get social scientists and technologists to develop games for the classroom. For a start, Dr Hang's committee wants to marry the arts and sciences and infuse technology into the arts. He feels that IDM 'can also take the arts to a new dimension'.

It was certainly a new dimension that audiences experienced at the techno arts fest.

There were international musicians as diverse as Kim Cascone, Ajay Kapur (with his robotic drums) and Dr Elaine Chew (with her musical spiral display).

The works of local poets such as Heng Siok Tian, Paul Tan, Yeow Kai Chai and Yong Shu Hoong were read aloud and a specially written software generated Peranakan-flavoured music based, among other things, on the reader's timbre and pitch.



NUS' Mixed Reality Lab has adapted Space Invaders into a floor-sized, family-friendly Age Invaders, bringing arcade gaming into the real world. -- PHOTO: NUS CENTRE FOR THE ARTS

Also, technologists Khoo Eng Tat, Mervyn Lian and Kelvin Yeo from NUS' own Mixed Reality Lab have adapted the traditional Space Invaders game into a floor-sized, family-friendly Age Invaders, bringing arcade reality into the physical dimension.

Ms Christine Khor, director of the Centre for the Arts at NUS, feels that the young will take to the fusion of art and tech. 'Our young are very adept at picking up technology. And expressing themselves through arts and technology is something they can get very fluent at.'

Elsewhere in the local arts scene, IDM is also evident.

Mr Lim Kay Tong, managing director of TheatreWorks, which is putting up Drift Net, an interactive performance about blogging, is excited about IDM.

'We are entering a new frontier. The challenge for us is to learn the technology, but not have it dictate one's creativity,' he said.

A work conceived by local video artist Choy Ka Fai, the performance takes inputs from muscle sensors strapped to a dancer which are fed via Bluetooth into custom-written software to generate the visuals, sounds and lighting on stage.

Said Mr Choy: 'The dancer can influence what happens on the stage by changing the data he sends to the software. There is interaction between him and the audiovisual and lighting results.'

The fact that no two performances can ever be identical appeals to the experimental nature in Mr Choy's vision, although 'there is some risk that things sometimes don't happen as predicted'.

Mr Lim also sees a challenge for audiences. Arts purists may be put off if too much technology is used, while technology fans may not be able to appreciate the art which the technology serves.

'Ultimately Singaporeans need to be adventurous and be open to new experiences,' he said.

Drum up an electronic beat

Mr Ajay Kapur has armed his robot drums to accompany his sitar-playing. LESLIE GOH learns how



Mr Kapur's robotic drums accompany him on his electronic sitar. -- PHOTO: NUS CENTRE FOR THE ARTS

Inspired by the way Google queries work, Mr Ajay Kapur built and programmed a set of four drums, each with four robotic drums, in April last year.

Born in San Francisco and now residing in Canada, Mr Kapur captured a mix of classical Indian music, dance tunes and jazz drum rhythms into a database built into each drum. The robotic drum accompanies Mr Kapur - beating away on its own when he plays on an electronic sitar. When the sitar sends a Midi (Musical Instrument Digital

Interface) signal to the drums in sequence, the signal acts like a Google query to the rhythm database. A search is run, and the drums takes the results - a sequence of rhythms - which their robotic arms then play. Effectively, each robotic arm delivers the result of the query by beating its own drum.

Here as a guest performer at the NUS Arts Festival, the classically trained Mr Kapur played at the University Cultural Centre last Sunday as part of the university's techno arts series.

A Princeton computer science graduate and a member of a band, the 26-year-old Mr Kapur was doing a soundcheck at a Montreal club where his band was playing at, when he accidentally pressed a button that kept looping a drum beat. He began to play along on his sitar, and 'realised the potential of how much fun it would be to have an automatic drummer'.

But using recorded samples became boring. And so began a journey to use robotics to handle the percussion.

Mr Kapur studied under two robot gurus the German-born artist Trimpin from Seattle and Mr Eric Singer from New York. He himself would write the algorithm to control the robot.

It took him three to four years to develop an electronic computerised 19-stringed sitar. The instrument, wired to him through sensors would play depending on his gestures - that is on the string that is plucked, the pitch, pluck timing, thumb pressure and even the tilt of his head.

And it outputs a series of Midi signals to the drums which would respond to his playing, with their own drumbeats. And he would react to that with his own chords. In this fashion, they could 'accompany each other musically'.

Currently working on his PhD, he has carried out a series research projects to create computerised controllers for the sitar and for two types of Indian drums, the dholak and the tabla.

Seeing notes with numbers

Learning how to see music is played is Dr Elaine Chew's goal



Dr Chew incorporates an interactive music system called Music on the Spiral Array, Real Time or MuSA.RT in her performances, a blend of music and mathematics. -- PHOTO: M. BASHEER

Music and mathematics blend beautifully in the person of Dr Elaine Chew.

'Music is a series of organised sounds. But in mathematical terms, when translated to Midi signals, it is just a sequence of events.'

Dr Elaine Chew's career and training as both a concert pianist and engineer debunks the stereotype that artistic people are not numerically inclined and vice versa.

The 37-year old concert pianist, who began playing the piano at age six, is the first recipient of the prestigious Viterbi Early Career Chair at the University of Southern California where she teaches in the Viterbi School of Engineering.

After her studies in Singapore Chinese Girls School and Hwa Chong Junior College, she went to Stanford University where she completed her bachelor's degree in music and computational mathematics.

Going on to the Massachusetts Institute of Technology in Boston, she did her master's and PhD in operations research. Her thesis, A Mathematical Model For Tonality, took the science of decision-making in operations research to represent the world of music.

Dr Chew, now a United States citizen, used what is known as a mathematical array - picture a spiral that resembles a DNA helix projected onto a screen - to analyse how people hear tones in music.

Her model has been refined by her husband, Dr Alexandre Francois, a research professor who is also at the University of Southern California.

And it is now an interactive music system called Music on the Spiral Array, Real Time or MuSA.RT.

With 37-year-old Dr Francois' software, the Spiral Array has become a 3D model in the shape of an ever-changing spiral which will rotate to show the side which best displays notes and keys.

Non-musicians have responded happily to the spiral display as it allows them a way of 'visualising the music'.

'In this model, the information flows in one direction only, so you don't see any interaction between myself and the display. We do have other systems where the performer can react and respond in real time to the visual display," Dr Chew explained.

- *By Leslie Goh*