Australia drops on digital access index

Over the four years from 1998 to 2002, Australia has dropped eight places in the International Telecommunication Union’s (ITU) Digital Access Index (DAI).

The index ranked 178 countries based on the overall ability of their citizens to access and use information and communication technology. The DAI combines eight variables, covering five areas, to provide an overall country score from 0 to 1. The areas are availability of infrastructure, affordability of access, educational level, quality of ICT services and internet usage.

Australia failed to make a showing in almost every category, including fixed line telephone subscribers per capita, mobile subscribers per capita and internet access prices as a percentage of per capita income. However, it did come first in the education list, which compared literacy and school enrolments.

Overall, Australia recorded the second largest drop on the list, from 11th in 1998 to 19th in the 2002 DAI, scoring 0.74 along with Belgium. The only country to fall further was New Zealand, which dropped nine places, from 12th in 1998 to 21st in 2002.

Other big movers down the index were South Africa (from 30th to 36th), France (from 17th to 23rd) and the US (from fifth to 11th).

Scandinavian countries took four of the top five places, with Sweden being first with a score of 0.85, followed by Denmark with 0.83 and Iceland with 0.82. South Korea also scored 0.82, which saw it improve 20 places from its ranking in the last DAI. Norway was fifth, while The Netherlands, Hong Kong, Finland, Taiwan and Canada rounded off the top 10.

The four Asian Tigers made the greatest progress over the last four years. Michael Minges of the Market, Economics and Finance Unit at ITU said these results suggest that English is no longer a decisive factor in quick technology adoption, especially as more content is made available in other languages.

“Over the last four years there’s been a big shift in ICT leadership, it’s moving towards Asia and away from the English-speaking nations,” he said.

“Until now, limited infrastructure has often been regarded as the main barrier to bridging the digital divide. Our research, however, suggests that affordability and education are equally important factors.”

Some of the poorest states in Africa and Asia come at the very bottom of the league table, hindered by lack of infrastructure or investment, poor education and literacy.

“In almost every country in that area one hour of internet use exceeds their per capita income,” Minges said.

“But the problems they face are more than digital. They have problems with poverty, hunger and other things that need to be tackled beforehand.”


Sources: International Telecommunication Union, Sydney Morning Herald, IDG News Service and Australian IT.

Light work of quantum computers

Researchers from the universities of Queensland (UQ) and Illinois have made a breakthrough towards the development of quantum computers.

In a paper published in *Nature*, they described the successful building and testing a C-NOT gate, an essential component to enable quantum computers to work, using single photons.

Project team leader Dr Andrew White of UQ's School of Physical Sciences said interest in quantum computers has grown since it was recognised that they could, in principle, solve certain problems that are effectively impossible to do with conventional computers. Quantum computers could make many attempts to solve problems simultaneously by exploiting properties of quantum information, thus speeding up the process.

“The critical component necessary for a quantum computer to work is a Controlled-NOT (C-NOT) gate – a gate that lets one qubit (quantum bit) control the state of another,” White said.

“If one qubit is simultaneously on and off, then both bits can become entangled – that is, correlated in apparently impossible ways. It is entanglement that makes quantum computing so powerful.”

At the invitation-only annual review of quantum computing by the US Army Research Office, White presented results from the C-NOT gate made using single photons. Using an automated tomography system developed in UQ's Quantum Technology Lab, he demonstrated that the gate reliably makes one qubit control another and, if one qubit is simultaneously on and off, the gate produces highly entangled qubits.

The research team, consisting of White, Dr Jeremy O'Brien, Dr Geoff Pryde, Assoc Prof Timothy Ralph (UQ) and Dr David Branning (University of Illinois), next plans to study gate errors. In a normal logic gate this is simple, as there are a small number of possible input states. It is more difficult in a quantum logic gate, as an infinite number of input states exist.

The UQ members are part of the Australian Research Council Centre of Excellence in Quantum Computing Technology. Their work has received US Army Research Office funding of US$750,000 for a three-year program.


---

University of Queensland researchers Dr Andrew White (left), Dr Geoffrey Pryde (back) and Dr Jeremy O’Brien (front) were part of the team that developed the first optical C-NOT gate.

PHOTO: CHRIS STACEY, THE UNIVERSITY OF QUEENSLAND
Motorola has announced it will close its research and development laboratory in Sydney at a cost of $35 million in short-term R&D, employing 400 staff at its Sydney software centre, cutting 58 positions.

Motorola maintains a local presence in short-term R&D, having announced a five-year, $35 million commitment earlier this year. Motorola Pacific division president John Ghergetta said the decision to close the Sydney facility was part of a global restructuring of R&D.

“This time of year we have our corporate labs come up with a new strategy based on centres of excellence, looking around the world to find critical mass in seven technology sectors,” he said.

“Sydney was a fantastic lab but what worked against it was working in five to six areas. You couldn’t honestly call it a centre of excellence where you get critical mass.”

The centre’s 53 staff will be eligible for redeployment locally and internationally. About 30% of staff from the earlier round of layoffs at the Sydney software centre were redeployed.

In an unrelated decision, Motorola’s Adelaide centre will be boosted by moves to locate a major chip design capability there. Working for Motorola’s semiconductor products sector, the facility will work on embedded applications, an area tipped for rapid growth.

Ghergetta said recruitment at the design centre has already begun and will continue over several years.

“Despite difficulties created by the changing marketplace and global strategies, Motorola remains committed to Australia and remains a major private investor in R&D through its software development and IC design activities,” he said.

Another 53 jobs lost

The University of Technology Sydney has joined global ICT program

The University of Technology Sydney has become the only Asia-Pacific university to join a research partnership program with communications company Alcatel, Australian IT has reported.

The program allows Alcatel’s research units to explore future product possibilities by working with universities from around the world. 11 overseas universities are already involved.

UTS and Alcatel have been working together since 1999 on various information technology and engineering projects. Alcatel is looking at the commercialisation of UTS research on network management solutions.

Although details of the long-term collaboration are yet to be finalised, some of the new projects will involve working out how some of Alcatel’s global projects will suit the Australian market. There will also be an opportunity for teacher and student exchanges with research and innovation centres overseas.
“Playable” nanoguitar shows electronics potential

Six years ago Cornell University researchers built the world’s smallest guitar – about the size of a red blood cell – to demonstrate the possibility of manufacturing tiny mechanical devices using techniques originally designed for building microelectronic circuits.

Now, by “playing” a new, streamlined nanoguitar, Cornell physicists have demonstrated how such devices could substitute for electronic circuit components to make circuits smaller, cheaper and more energy-efficient.

Lidija Sekaric built the new, playable nanoguitar, which is five times larger than the original, while an applied physics graduate student at Cornell with graduate student Keith Aubin and undergraduate researcher Jingqing Huang.

Its strings are made from silicon bars 150nm x 200nm in cross-section and ranging from 6 m-12 m in length. The strings vibrate at frequencies 130,000 times higher than those of a real guitar.

The nanoguitar is played by hitting the strings with a focused laser beam. When the strings vibrate they create interference patterns in the light reflected back, which can be detected and electronically converted to audible notes. The device can play only simple tones, although chords can be played by activating more than one string at a time. The pitches of the strings are determined by their length, not by their tension as in a normal guitar, but the group has “tuned” the resonances in similar devices by applying a DC voltage.

Sekaric said the ability to make tiny things vibrate at very high frequencies offers many potential applications in electronics.

“Mobile phones and other wireless devices, for example, usually use the oscillations of a quartz crystal to generate the carrier wave on which they transmit or to tune in an incoming signal. A tiny vibrating nanorod might do the same job in vastly less space, while drawing only milliwatts of power.”

Moore’s Law still prevails

Intel has achieved an average feature size of just 65nm for its next generation computer chip, half the size of the most advanced manufacturing technology in use today.

If the chip is manufactured by 2005 as planned, it will ensure that the number of transistors engineers can fit into a given area will continue to double every two years – keeping Moore’s Law, named after Intel cofounder Gordon Moore, alive.

The new chip is a static random access memory (SRAM) cell, a faster and more reliable alternative to dynamic RAM. SRAM cells made by a 90nm process first used in manufacturing this year are 1 m² in size. In contrast, the new 65nm process produces cells that are only 0.57 m².

The SRAM chip relies on technologies Intel has used to preserve Moore’s Law before. This includes strained silicon, introduced for the 90nm chip, and copper interconnects, introduced for the 130nm chip in 2001.

Strained silicon is a manufacturing technique in which a layer of silicon germanium is deposited on top of a silicon wafer. The atoms in each substance naturally seek to align themselves, which stretches the silicon, allowing more electrons to flow than was possible with just silicon.
Shrinking circuits

Researchers at Harvard University in the US have demonstrated a technique to apply a film of high-performance silicon nanowires to glass and plastic, which could pave the way for cheaper, lighter and more powerful consumer electronics.

Dr Charles Lieber, head of the research project and a professor of chemistry at Harvard, said the silicon nanowires are better at carrying an electrical charge than amorphous silicon and polycrystalline silicon, which are used for making electronic components such as computer chips and LCDs.

“Although a single nanowire is one thousand times smaller than the width of a human hair, it can carry information up to 100 times faster than similar components used in current consumer electronic products,” he said.

Lieber said the wires have already been shown to have the ability to serve as components of highly efficient computer chips and can emit light for brilliant multicolour optical displays, but until now it has been difficult to apply them to consumer products.

“As with conventional semiconducting materials, the growth of high-quality nanowires requires relatively high temperature. This temperature requirement has up until now limited the quality of electronics on plastics, which melt at such growth temperatures,” he said.

“By using a bottom-up approach pioneered by our group, which involves assembly of preformed nanoscale building blocks into functional devices, we can apply a film of nanowires to glass or plastics long after growth, and do so at room temperature.”

Using a liquid solution of the silicon nanowires, the researchers demonstrated they can deposit the silicon onto glass or plastic surfaces – similar to applying the ink of a laser printer to a piece of paper – to make functional nanowire devices. They also showed that nanowires applied to plastic can be bent or deformed into various shapes without hurting performance.

DNA transistor

Researchers at the Technion-Israel Institute of Technology have used DNA to create a self-assembling nanoscale transistor.

Erez Braun, project head and associate professor in the Faculty of Physics at the Technion, said to get the transistors to self-assemble, the research team attached a carbon nanotube onto a specific site on a DNA strand and then made metal nanowires out of DNA molecules at each end of the nanotube. The result is a transistor that can be switched on and off by applying voltage to it.

“Though transistors made from carbon nanotubes have already been built, those required labour-intensive fabrication,” he said. “The goal is to have these nanocircuits self-assemble, enabling large-scale manufacturing of nanoscale electronics.

“DNA is a natural place to look for a tool to create these circuits. But while DNA by itself is a very good self-assembling building block, it doesn’t conduct electrical current.”

To overcome these challenges, the researchers manipulated strands of DNA and added an E. coli bacterium protein to one segment. They then added other protein molecules to the test tube, along with protein-coated carbon nanotubes. These proteins naturally bond together, causing the carbon nanotube to bind to the DNA strand at the bacterium protein.

Finally, they created tiny metal nanowires by coating DNA molecules with gold. In this step, the bacteria protein also prevented the metal from coating the bacteria-coated DNA segment, creating extending gold nanowires only at the ends of the DNA strand.

Braun said the next challenge is to encourage the nanotube to line up parallel to the DNA strand, meet the nanowires at either end and thus make a circuit.

The research is published in the 21 November 2003 issue of Science.

Call to join global nanotechnology network

International R&D network IMS (Intelligent Manufacturing Systems) is inviting Australian companies, institutions and individuals to express their interest in collaborating in a global effort to develop manufacturing processes in nanotechnology.

It is proposing to establish a Community of Common Interest (CCI), called n-ABLE, with manufacturers, users, product developers, investors, researchers, academics and others with an interest in participating and collaborating in a long-term relationship that will drive innovation in manufacturing for the nanotechnology industry.

“The intention of the CCI is to enable and facilitate synergies among its members while creating new IMS projects and programs to address the priority needs of the nanotechnology-manufacturing sector,” Tony Strasser, manager of the IMS Australia Secretariat, said.

“Additional priorities include addressing the need for education and training in the new production methods, tools, and analytical and testing techniques required for nanotechnology manufacturing.

“They also involve understanding the possible toxic and other hazardous properties of various nanomaterials and the possible effects those materials, along with processing at the nanometre scale, may have on other living matter.”

Those interested in participating in the CCI can contact IMS Australia on phone 02 9928 2366 or email IMSAustralia@au.ims.org.

**Watermarking and the protection of digital media**
*by Sean King, University of Canberra*

The University of Canberra ITEESPAN presentation focused on watermarking still images in the frequency domain. The speech included an overview of general watermarking techniques; the effects of embedding data in the frequency domain; the processes involved in imperceptible insertion; and an insight into Image Guard, a watermarking package developed by engineering students at the university.

Digital media can be easily copied without degradation in quality. The simplicity of perfect replication has lead to large-scale problems in protecting copyright of digital media.

The necessity for protection of still images, video and audio is continually increasing. The International Intellectual Property Alliance estimated the US economy alone lost more than $9 billion due to copyright breaches in the 2000/01 financial year.

Digital watermarking is emerging as a primary security solution for the prevention of unauthorised duplication, modification and misuse of digital media.

Watermarking involves imperceptibly embedding an identification signal, called a watermark, into a specified host signal. The modification of the host signal is undetectable to humans, however a designated detector can easily extract the watermark. Digital watermarking has a number of applications including copyright protection, authentication, broadcast and publication monitoring, and tamper inspection.

The major characteristics considered when selecting a watermarking technique are robustness, perceptibility and fidelity. Other issues include the computational costs and false positive rates of the technique. After researching the various techniques it was decided that the frequency domain displayed the most desirable characteristics.

Image Guard is a watermarking package developed by final-year computer engineering students Brad Willis, Ben Bordiss and myself. The package is based on the look-up table technique that was proposed by Min Wu and Bede Liu of Princeton University in their paper “Wa-

### Look-up table: each user's table has the same top row, however the pattern of 0s and 1s on the bottom row will be different depending on the user.

<table>
<thead>
<tr>
<th>-128</th>
<th>-127</th>
<th>...</th>
<th>33</th>
<th>34</th>
<th>35</th>
<th>36</th>
<th>37</th>
<th>...</th>
<th>126</th>
<th>127</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>...</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>...</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

8 x 8 block in frequency

The first bit of the watermark is inserted into an 8 x 8 block of the image. Here a white bit (1) of the watermark is inserted by changing the DCT coefficient 34 to 36 according to the entries in the look-up table.
Rally reconnaissance automation system
by Joshua Thow, Australian National University

The dynamic environment in which rally vehicles operate poses an interesting problem for data-acquisition and processing. The Rally Reconnaissance Automation System is a navigation tool that interprets vehicle trajectory information into the language used by the crew of the rally vehicle.

As the driver controls the vehicle through a set course of a rally competition, the codriver reads aloud a description of the road ahead. The pace-note instructions allow the driver to prepare for corners, jumps, hazards and other road conditions. The pace-notes are compiled during preevent reconnaissance, where the course is driven slowly to allow the crew to assess the conditions and write them down in a short-hand script.

The Rally Reconnaissance Automation System aims to minimise the human estimation involved in reconnaissance, hence improving the accuracy of the pace-notes and efficiency of the process.

Many factors are considered by the crew when writing an instruction, and each of these must be measured by the system to accurately replicate the pace-note output. While a simple analysis of vehicle attitude and inertia provides much of the information needed, other factors such as wheel slip and driving style must also be considered.

The design uses existing and introduced sensors to acquire dynamic vehicle data. The acquired data is analysed by software executed on a single board computer, which displays the generated pace-notes to the codriver through an LCD.

A prototype acquisition system was implemented during the project, which focused on processing the most frequently used pace-notes that described corners and distances inside the course. A gyroscope provided vehicle heading information, while wheel speed sensors provided velocity and position of the vehicle. The sensors were sampled by a PIC microprocessor that was integrated onboard with signal conditioning circuitry. The PIC software transmitted the sensor data to the single board computer for processing, through a serial communications interface.

While the development of the processing software and graphical user interface continues, the data-acquisition system has been implemented with an aim towards production. The system successfully performed in acquiring fundamental vehicle data. The challenge to expand the abilities of the system to detect more subtle road conditions (such as when a crest will be driven fast enough to become a jump) will continue as development progresses.

Development for the Rally Reconnaissance Automation System was initiated by Joshua Thow of the Australian National University for the final year Systems Engineering Honors project. The project was conducted in conjunction with a local engineering consultancy, Qirx Pty Ltd.

Sean King is undertaking the double degree Bachelor of Computer Engineering / Bachelor of Law at the University of Canberra. Readers interested in learning more about digital watermarking or the Image Guard package project team at the University of Canberra’s Information Sciences and Engineering Department.

One bit of a black and white watermark is inserted in each block of the image. If the first bit of a watermark is white (1) then every embeddable DCT coefficient in the first image block will be mapped to the nearest coefficient in the look-up table with an entry of 1. The technique works by breaking the original image into blocks of 8 x 8 pixels. Each block is then converted into the frequency domain using the Discrete Cosine Transform (DCT), resulting in an 8 x 8 block of numerical coefficients. The coefficients range from -128 to 127, and are known as the DCT coefficients of the 8 x 8 block.

The Rally Reconnaissance Automation System is a navigation tool that interprets vehicle trajectory information into the language used by the crew of the rally vehicle. The difficult task of putting a single photon into a single board computer, which displays the generated pace-notes to the codriver through an LCD.

The detection of single photons is a very difficult yet interesting task due to the high voltage, very fast response times and the need for cooling. This project covered the entire development of a basic SPD for use at a communications wavelength, including the design, development and testing of the circuits that provide these properties and the physical design of the mounting. The project also used a novel way to obtain, store and analyse the test data obtained during the characterisation of the avalanche photodiode used in the detector.

The difficult task of putting a single photon on to the active area of the avalanche photodiode, and obtaining and analysing the necessary data to show that this photon can be detected, was also addressed.
Marconi’s Miracle: The Wireless Bridging of the Atlantic

by Donald Tarrant

Hardback 109 pages with black and white illustrations
Flanker Press Ltd, St John’s, Newfoundland, Canada 2001 ISBN 1-894463-13-7
Available from www.tidespoint.com

Review by David Edwards

This book is a detailed account of Guglielmo Marconi’s epic feat of communication by radio across the Atlantic Ocean from Poldhu in Cornwall to St John’s, Newfoundland. It was a gift recently sent to me by my friend Len Zedel in St John’s.

The introduction to this book provides a brief overview of the part Newfoundland has played in reducing the apparent size of the world. The first transatlantic telegraph cables terminated there; it was the departure point for Alcock and Brown’s pioneering non-stop transatlantic flight; and the first transatlantic telephone cable also terminated in Newfoundland. This book, however, is about the first transatlantic radio telegraphy signal.

The first chapter gives a summary of early communications technology and the role played by pioneers such as Oersted, Faraday, Wheatstone, Cooke, Morse, Maxwell, Hertz and Lodge. In 1888, Heinrich Hertz proved that James Clerk Maxwell’s theoretical electromagnetic waves actually existed by transmitting and receiving a radio signal through the air in his laboratory.

Chapter 2 provides brief details of Marconi’s family (his mother was from an Anglo Irish whisky family, his father was an Italian businessman) and his early experiments at Villa Griffoni at Pontecchio in Italy. It was here in 1895 that Marconi succeeded in receiving radio signals from his transmitter at distances of more than one mile (1.6km). Due to the location of his workshop and the topography of Villa Griffone, the longer distances were not line of sight. A small hill rises behind the villa and the young Marconi succeeded in receiving signals beyond its brow.

Chapter 3 details how in 1896, after receiving a rebuff from the Italian Department of Posts and Telegraph, 23-year-old Marconi journeyed to England, where his mother’s family contacts gave him valuable assistance in patenting his invention and then demonstrating it to William Preece, the engineer-in-chief at the British Post Office. Marconi continued to refine his system and by 1899 had succeeded in sending wireless telegraphy signals across the English Channel. He had also developed the theory of tuning, which allowed many simultaneous signals to be transmitted and received at once, without interference. This became the famous “four sevens” patent of 1900.

In September 1899 Marconi travelled to America and gained excellent publicity by using his wireless telegraphy system to report on the October 1899 America’s Cup yacht race between the USA’s Columbia and the English Shamrock II. What made Marconi’s system such a breakthrough was that he transmitted live reports from two ships that accompanied the racing yachts.

The conclusion of Chapter 4 covers his early attempts (and failures) at transatlantic wireless communications, using very large transmitters and giant aerial systems. Unfortunately, in late September 1901, the antenna systems at both Poldhu in Cornwall and Cape Cod in Massachusetts were destroyed by storms. But Marconi persevered, rebuilding the Poldhu antenna to a different design and deciding to relocate to St John’s, Newfoundland, over 1000 miles closer to Cornwall.

Chapter 5 provides a brief overview of early communications in Newfoundland, with details of land and sea based telegraphic systems, as well as land based telephones.

Marconi and his assistants Kemp and Paget arrived in St John’s on 6 December 1901, and soon set up their receiver and aerial systems on Signal Hill. The balloons were no match for the blustery winds, but the kites fared better. However, their height varied with the gusts and this caused unwanted signal intensity variations, forcing Marconi to use a less sophisticated receiver. Marconi persevered and was rewarded at 12.30pm on 12 December 1901 when both he and Kemp heard the Morse signal “dot dot dot” for S, which they knew had originated at Poldhu.

Marconi’s faith in wireless had been vindicated, but problems lay ahead. The Anglo-American Telegraph Company had a government authorised monopoly on all telegraphic communications with Newfoundland, and this included wireless telegraphy. Marconi was forced to abandon plans to set up a permanent station in Newfoundland and moved instead to Nova Scotia.

The book concludes with a brief epilogue, which details his ultimate success in establishing a full duplex wireless telegraphic service across the Atlantic Ocean and recounts in brief how Marconi was awarded the Nobel Prize for physics in 1909.

Overall, this book, with its emphasis on local events and occurrences in Newfoundland, would be a worthy addition to the library of anyone interested in the early history of telecommunications. Author Donald Tarrant is a professional engineer with over 30 years experience in the communications industry who lives in St John’s. He is also the author of “Atlantic Sentinel: Newfoundland’s Role in Transatlantic Cable Communications”.●
Computing

Conference: AMF: Fifth international conference on advances in fluid mechanics Lisbon, Portugal 22 March (3 days). Inquiries: Heat Transfer Lisbon, Portugal 24 March (3 days); BEM 26: 26th world conference on boundary and mesh reduction methods Bolonga, Italy 19 April (3 days); Computational finance Bolonga, Italy 21 April; Oil spill: Fourth international conference on oil & hydrogen carbons spills, modelling, analysis & control Alicantia, Spain 28 April (3 days).

New learning: International conference on new learning paradigms and new learning tools Skikatheros, Greece 10 May (3 days); Data security Skikathros, Greece 11 May (3 days).

Inquiries: Tarek Aboeldrahem, University of Toronto email vm408chair@usenix.org, web www.usenix.org/events/vm04/


toronto email vm04chair@usenix.org, web www.usenix.org/events/vm04/index.html

Conference: 26th international conference on software engineering Edinburgh, UK 23 May (6 days). Inquiries: Anthony Finkelstein email a.finkelstein@cs.ucl.ac.uk, web conferences.ieee.org/ICSE

Workshop: Third annual workshop on duplicating, deconstructing and debunking Munich, Germany 19 June (2 days). Inquiries: Bryan Black, Intel Labs email bryan.black@intel.com, web www.ece.wisc.edu/~wddd//index.shtml

Conference: 17th international conference on parallel and distributed computing systems San Francisco, US 15 Sept (3 days). Inquiries: Waleed S. Smari, University of Dayton, USA +505 277-6724, email dbader@ece.unm.edu, web multimedia.ece.uic.edu/jpdc

Conference: 8th international conference on parallel and distributed problem solving from nature Birmingham, UK 18 Sept (5 days). Inquiries: Xin Yao, University of Birmingham +44 121 414 4221, fax +44 121 441 4428, email ppsn04@cs.bham.ac.uk, web events.cs.bham.ac.uk/ppsnp04

Symposium: Symposium on hardware/software codesign Rio de Janeiro, Brazil 12 Oct (4 days). Inquiries: World Scientific and Engineering Academy and Society (WSEAS) email peri@wseas.org, web www.worldses.org/conferences/ibrazi/iiscocco

Symposium: 12th international symposium on the foundations of software engineering Newport Beach, US 31 Oct (7 days). Inquiries: Richard N. Taylor, Information and Computer Science, University of California +949 824 6249, fax +949 824 1715, email taylor@uci.edu, web www.iris.uci.edu/FSE-12

Control

Conference: 5th Asian control conference Melbourne 20 July (4 days). Inquiries: email asscc@ee.mmu.oz.au, web asscc.ee.mmu.oz.au

Symposium: IFAC symposium on mechatronic systems Sydney 6 Sept (3 days). Inquiries: email mechatronics@ee.newcastle.edu.au, web mechatronics.newcastle.edu.au/mech

Conference: Asia and South Pacific design automation conference Yokohama, Japan 27 Jan (4 days). Inquiries: Conference secretariat, Japan Electronics Show Association +81 3 5402 7661, fax +81 3 5402 7605, email asdpac@jesa.or.jp, web www.asdpac.org

Symposium: Advances in automotive control Salerno, Italy 19 April (5 days). Inquiries: International Federation of Automatic Control email ifac04@unisa.it, web www.ifac04.unisa.it

Conference: The IEEE international conference on robotics and automation New Orleans, US 26 April (7 days). Inquiries: www.egr.msu.edu, email mwodes@seas.ucla.edu, web mechatronics@ee.newcastle.edu.au, web mechatronics.newcastle.edu.au/mech

Symposium: 2nd IFAC symposium on telematics applications in automation and robotics Helsinki, Finland 21 June (3 days). Inquiries: Finnish Society of Automation +358 201 981220, fax +358 201 981227, email office@atuu.fi, web www.automatiosaura.fi/index.php

Conference: World automation congress Seville, Spain 25 June. Inquiries: WAC secretariat +1 505 298 5817, fax +1 505 291 0013, email wac@cybermesa.com, web www.wacong.com/Wac

Conference: American control conference Boston, US 30 June (3 days). Inquiries: Jason Speyer, UCLA +1 310 206 4451, fax +1 310 206 2302, email speyer@seas.ucla.edu, web www.mie.uic.edu/acc/index.asp

Symposium: Intelligent autonomous vehicles Lisbon, Portugal 5 July (3 days). Inquiries: International Federation of Automatic Control email iav04@iris.ist.utl.pt, web iav04.iris.ist.utl.pt

Conference: Control applications in marine systems Ancona, Italy 7 July (3 days). Inquiries: International Federation of Automatic Control email cams04@union.it, web www.automazione.ee.unin.it/cams04

Symposium: IFAC symposium on large scale systems: Theory and applications Osaka, Japan 26 July (3 days). Inquiries: International Federation of Automatic Control email ikeda@mech.eng.osaka-u.ac.jp

Workshop: IFAC workshop on periodic control systems Yokohama, Japan 30 Aug (3 days). Inquiries: email sano@sd.keio.ac.jp, web www.coms.saitama-edu.ac.jp/facows04/main.html

Symposium: 6th IFAC symposium on nonlinear control systems Stuttgart, Germany 1 Sept (3 days). Inquiries: International Federation of Automatic Control email nolcos@uni-stuttgart.de, web www.nolcos.uni-stuttgart.de

Conference: Advanced control strategies for social and economic systems Vienna, Austria 2 Sept (3 days). Inquiries: International Federation of Automatic Control email kopcak@iht.tuwien.ac.at, web www.iht.tuwien.ac.at/acos04

Workshop: 2nd IFAC workshop on advanced fuzzy and neural control Oulu, Finland 16 Sept (2 days). Inquiries: International Federation of Automatic Control email office@atu.fi, web www.ntasat.oulu.fi

Workshop: Discrete event systems Reims, France 22 Sept (3 days). Inquiries: International Federation of Automatic Control email wodes04@univ-reims.fr, web www.univ-reims.fr/wodes04

Electronics

Conference & Exhibition: electronicsUSA and embedded systems conference San Francisco, US 29 March (5 days). Inquiries: International Chamber of Industry and Commerce 03 9867 1198, fax 03 9867 1199, email gcncmiel@gmbh.org, web www.electronicsusa.com

Conference: 24th international conference on microelectronics Nis, Serbia and Montenegro 16 May (4 days). Inquiries: Ninoslav Stojadinovic, University of Nis +381 18 592326, fax +381 18 46180, email miel@elfak.ni.ac.yu, web uninet.elfak.ni.ac.yu/miel

Conference: 11th international power electronics and motion control conference Riga, Latvia 2 Sept (3 days). Inquiries: Riga Technical University +371 708 9415, fax +371 782 0094, email Epe-pemc@adm.rtu.lv, web www.rtu.lv/epe-pemc

Conference: European powder diffusion conference Prague, Czech Republic 2 Sept (4 days). Inquiries: Radomir Kuzel, Czech and Slovak Crystallographic Association +02-2-21911394, fax +042-2-24911061, email kuzel@karlov.mff.cuni.cz, web www.xray.cz/epdc

Information Technology

Conference: Annual Australian Linux technical conference Adelaide 12 Jan (6 days). Inquiries: Linux Australia web www.linux.org.au


Symposium: 3rd international symposium on foundations of information and knowledge systems Vienna, Austria 17 Feb (4 days). Inquiries: www.linux.at, web www.linux.at

Conference: 22nd AIAA international communications satellite systems conference and exhibit Monterey, CA, US 9 May (4 days). Inquiries: Chris Hoeber email hoeberr.chris@ssdloral.com, web www.aiaa.org

Conferences: Gender & IT, Cadiz, Spain 6 Sept (3 days); Psychology & IT, Cadiz, Spain 7 Sept (3 days); MIS: Fourth international conference on management information systems, incorporating GIS and remote sensing Malaga, Spain 13 Sept (3 days); Data mining Malaga, Spain 15 Sept (3 days). Inquiries: Wessex Institute of Technology +44 230829 3223, fax +44 230829 2583, email enquiries@wessex.ac.uk, web www.wessex.ac.uk


Conferences: Gender & IT, Cadiz, Spain 6 Sept (3 days); Psychology & IT, Cadiz, Spain 7 Sept (3 days); MIS: Fourth international conference on management information systems, incorporating GIS and remote sensing Malaga, Spain 13 Sept (3 days); Data mining Malaga, Spain 15 Sept (3 days). Inquiries: Wessex Institute of Technology +44 230829 3223, fax +44 230829 2583, email enquiries@wessex.ac.uk, web www.wessex.ac.uk


Symposium: 3rd international symposium on foundations of information and knowledge systems Vienna, Austria 17 Feb (4 days). Inquiries: www.linux.at, web www.linux.at
Playback video monitor

Amtex Electronics has introduced the 16.2cm Videoflyer, a solid state memory card playback video monitor.

A self-contained digital viewing monitor used for looping video display, the unit comprises of a 16.2cm colour TFT LCD panel. With the use of a plug-and-play CompactFlash card, video is stored and played in MPEG-1 video format and high-resolution MPEG stills can also be used with or without audio. Video is programmed into the CompactFlash card by using DV Flashwriter software.

A heavy-duty aluminium enclosure houses the monitor along with 2W built-in stereo speakers and an optional jack out for external speakers. Autoplayback is used on power up, while continuous playback is used when looping video tracks. Playback options include any order track sequencing, selectable track length and manual startup of track after power up.

Electronic control design

The MathWorks has announced the availability of its Embedded Target for OSEK/VDX and Embedded Target for Motorola HC12. Based on the company’s Real-Time Workshop Embedded Coder platform, the products allow engineers to automatically generate and deploy code from Simulink directly onto mass production electronic control units (ECUs) as opposed to manually developing and integrating code.

The new Embedded Targets also satisfy the emerging on-target rapid prototyping market by allowing companies to develop and test new functionality on the embedded processors of existing production or fleet vehicles rather than on rapid prototyping systems.

Automotive engineers can design, simulate and test control algorithms to generate code that can be downloaded to general-purpose ECU hardware for rapid prototyping or production deployment. This approach enables manufacturers to cut several weeks or months from the traditional design process by performing many design iterations early in a vehicle program.

The MathWorks software is distributed in Australia through ceanet.

Electronics design software

Altium, a developer of Windows-based electronics design software, has released a new product to provide a vendor-independent solution for system-level design on an Field Programmable Gate Array (FPGA) platform.

Nexar integrates hardware design tools, embedded software development tools, IP-based components, virtual instrumentation and a reconfigurable development board to allow mainstream engineers to interactively design and implement an embedded system inside an FPGA.

Benefits include parallel design of hardware and software; greater flexibility in hardware/software design partitioning; an integrated FPGA vendor-independent solution for putting embedded systems into FPGAs; and an interactive design environment for system-on-FPGA development and debug.

At the system level, Nexar provides a schematic-based design methodology to define system connectivity. It contains libraries of royalty-free, presynthesised, preverified IP components, including a range of processor cores, that can be dropped onto the schematic and connected together to form the system hardware.

Nexar components are processed for a variety of target FPGA architectures from multiple vendors. This allows design portability between FPGA device families and ensures a flexible vendor-independent approach to design. Nexar automatically and transparently selects the correct component model for the target architecture during system synthesis.

For more information on any of these products, send an email to shollis@engaust.com.au with the subject headline “Monitor Qikreply”. Your contact details and the Qikreply number of the product should be included in the body of the email.