

**IEEE India Bulletin Vol. 12 No. 7 July 2004****INDEX****Features**

[|| Chairman's Message ||](#) [Editor's Desk](#) || [Technology In Brief](#) || [Library Scan](#) || [IEEE News & Events](#) ||

**CHAIRMAN'S MESSAGE**

Dear fellow members,

A reminder on The **INDICON** - the annual conference of IEEE in India for 2004 that will be held in Kharagpur during 20 - 22 Dec 2004. Please send in your papers by July 31, 2004 and visit the web site [www.ee.iitkgp.ernet.in/indicon2004](http://www.ee.iitkgp.ernet.in/indicon2004) for further details.

During the last A&A Review Panel meeting held on 19 June 2004 in Kansas City, MO, of the 244 new Senior Members elevated, 20 were from India. This is a big achievement and I urge all Sections to aggressively nominate deserving members for SM elevation. Hurry up since the next A&A Senior Member Review Panel Meeting will be held on 7 August 2004 in Detroit, MI. The percentage of SMs in the HG members is a health indicator and in India it is 9.3% with KGP Section at highest ( 27 SMs in 76 higher grade members - 35.6%) and Delhi Section at 17.2%. Delhi is doing a very good job of elevating distinguished members to SMs, thanks to Dr Subrata Mukhopadhyay and team. Request all Sections to follow suit and ensure that atleast 5 members are elevated each time.

The India Council places on record its gratitude and sincere thanks to Bombay and Kerala Sections for having already sent in their contributions.

93 of the 228 Student Branches ( nearly 40%) are NOT in good health. We need to do give our attention to ensure that all these 93 student branches are brought back to good health. Of these 93 sick branches 50% is in Madras, another 16% in Bombay and the rest in the other 6 sections. SBs in both KGP and UP Sections are all healthy.

The second 2004 meeting of the India Council is scheduled to be held on 7 August 2004 in Bombay.

Mr. W. Cleon Anderson, 2004 IEEE President Elect plans to visit a few Sections in India during Jan 2005 after he takes over the post of IEEE 2005 President. Arrangements are being made for a fruitful visit of the President and team.

Looking forward to your active participation in IEEE and

with best regards,

**R. MURALIDHARAN**

Chairman - IEEE India Council

[r.muralidharan@ieee.org](mailto:r.muralidharan@ieee.org)

Mumbai  
1July 04

**EDITOR'S DESK**

***Great opportunities are lying hidden in existing systems - Let us unearth them and put them to use***

When Plain Old Telephones (POTs) were introduced several decades back, nobody thought that its copper cable pairs will one day be the carrier of high speed Internet traffic as well, in addition to our voice. Digital Subscriber Line (DSL), the technology which made this path breaking application possible has given a new lease of life to the 1000 + million copper cable pairs crisscrossing the world today, laid for voice communication. Same is the case with cable TV network originally conceived to carry TV channels to homes. Today these cables also carry high speed Internet traffic, thereby taking more mileage out of the existing network.

Yet another excellent infrastructure lying untapped for modern applications like Internet is the electricity distribution network touching every nook and corner. With technology infusion, it is being made to carry Internet, TV programmes and other services also into every room of our homes. In all these cases, the network is already available and at some extra cost, a most wanted service could also be channelled through it - thereby saving time, money and resources.

Earth's resources are fast depleting while our needs are on the rise. Engineers and scientists can play a major role in this context than ever before, to identify hidden potentials in existing systems and bring them to meaningful applications. Biodegradability, reusability and such other features are widely being applied these days, thanks to innovative thinking in various areas of human activity.

Let us remember that any new capability unearthed this way would help the world to be more sustainable.

Trivandrum

1 July '04

**N.T.Nair**

Editor

e-mail: [del@vsnl.com](mailto:del@vsnl.com)

#### CALL FOR PAPERS AND PARTICIPATION

JOINT CONFERENCE ON VLSI DESIGN AND ON EMBEDDED SYSTEMS

**The 18th International Conference on VLSI Design**

**The 4th International Conference On Embedded Systems**

**JANUARY 3 - 7, 2005 ♦ TAJ BENGAL KOLKATA, INDIA**

**Theme: Power Aware Design of VLSI Systems**

**Sponsored by:**

VLSI Society of India (VSI), Indian Statistical Institute, Kolkata, MCIT, Govt. of India\*

**Technically Co-sponsored by:**

IEEE Circuits and Systems Society, ACM Special Interest Group on Design Automation, IEEE Electron Devices Society\*

The joint-conference is a forum for researchers and designers to present and discuss various aspects of VLSI Design, electronic design automation (EDA), and VLSI technologies and embedded systems. It covers the entire spectrum of activities in the two vital areas, which underpin the semiconductor industry. The five-day program will consist of regular paper sessions, special sessions, embedded

tutorials, panel discussions, design contest and industrial exhibits followed by two days of tutorials.

**TOPICS OF INTEREST:** Papers are invited on topics related to, but not limited to, the following areas:

*Design Methods Track* - Process technology, processor design, analog-digital mixed signal SOC, concurrent package and board design, CMOS and interconnect reliability, integrated circuit manufacturing, device modeling and simulation, signal integrity and circuit marginality issues, low-power design, mixed signal design, DSP design, functional verification

*Design Tools Track* - High-level synthesis, logic synthesis, design validation, ASIC design, core-based systems, test and DFT, analog CAD, MEMS, performance-driven design, physical design, programmable devices, standards, digital imaging, SoC design platforms.

*Embedded Systems Track* - Hardware/software co-design and verification, embedded software design, reconfigurable hardware design, architecture mapping, FPGA-based design

**PAPER SUBMISSION:** Please submit previously unpublished papers electronically (as postscript or pdf files) on the conference website by July 10, 2004. The manuscript should clearly state the novel ideas, results and applications of the contribution. Submissions will undergo BLIND REVIEW. On a separate title page, please provide the abstract of the paper, name, address, e-mail, telephone and/or fax numbers of all authors with the contact author identified. Papers should not exceed 15 double-spaced pages including figures and references. Authors will be notified of acceptance by August 31, 2004. Camera-ready papers should be submitted on the conference website by September 27, 2004.

**SPECIAL SESSIONS/PANELS:** Proposals for special sessions (a set of related papers on a subject) will be considered for inclusion in the technical program. A special session proposal should include a two-page summary of the session and a list of papers. Papers in the list should be submitted according to the paper submission guidelines. The proposal should be submitted on the website by July 10, 2004. Papers that are part of a special session will go through the same peer review process as regular papers.

**FELLOWSHIPS:** The Steering Committee will award fellowships, based on need and merit, to partially cover the expenses of attendees from India. Applications must be submitted by October 15, 2004, at the conference website.

### IMPORTANT DATES

Special session/panel proposal deadline: July 10, 2004; Regular paper submission deadline: July 10, 2004; Design contest entry deadline: July 31, 2004

Acceptance notification to all authors: August 31, 2004; Camera-ready paper deadline: September 27, 2004;

Fellowship application deadline: October 15, 2004; Conference dates: January 3-7, 2005

For more information, please contact publicity chair **Susanta Chakraborty** Kalyani University susanta\_chak@hotmail.com  
or visit the websites: <http://www.isical.ac.in/~vlsi2005> or <http://vlsi.nj.nec.com>

### Technology in Brief

#### WIRELESS BULLETS TRANSMIT INFORMATION

With a diameter of only 1.7 centimeters, a new **Smart Bullet** can be shot for the sole purpose of transmitting information directed for a wireless computer only 70 meters away. Located inside the bullet is a sensor, transmitter and battery, that once the bullet makes contact with a target, an accelerometer generates data for analysis. The prototype of the Smart Bullet was funded by Lockheed Martin and created at the University of Florida's Gainesville Campus. For more, visit:

<<http://www.newscientist.com/news/news.jsp?id=ns99995054>>

## RFID TAGS MAY HELP TRIM HEALTH CARE COSTS FOR ELDERLY

Technologies exist that could allow the nation's aging population to remain independent longer, saving substantial amounts on assisted living. But who will foot the bill for such high-tech remedies? And who will be liable should the systems fail? IEEE-USA Today's Engineer's Terry Costlow looks at radio frequency ID tags and some the hurdles the emerging technologies face, in the latest edition of IEEE-USA Today's Engineer:

<<http://www.todaysengineer.org/May04/RFID.asp>>

Meanwhile, the current issue of IEEE Pervasive Computing contains abstracts for six in-process projects seeking to develop solutions to quality-of-life challenges for the elderly. (Adobe Acrobat Required.)

<<http://www.computer.org/pervasive/pc2004/b2048.pdf>>

### World's smallest RFID reader moves technology into music, videos

An RFID reader the size of a dime will allow the increasingly popular technology to be incorporated into film and music posters. The miniature reader, manufactured by Innovision Research & technology of Berkshire, England, supports the Near Field Communication (NFC) standard, which allows interaction of electronic devices when they touch each other. Thus, PDAs and MP3 players equipped with the reader may download music or videos just by tapping the device against a smart music or video poster. NFC, which was launched by Nokia, Philips, and Sony earlier this year, will serve as a digital identifier; when the connection between the NFC-enabled devices is established, WiFi or Bluetooth will be used to transfer the data. Analysts say the first NFC-enabled devices will be available in 12 to 18 months.

**PLUS:** The RFID market will reach \$1.3 billion by 2008, from the current level of \$91.5 million, according to research firm IDC. Other analysts, however, are more pessimistic, saying it could take up to six years to prove the technology's value.

### The state of WiMAX

Wi-Fi has gained popularity and market penetration last year, Wi-Fi hardware revenue reached \$1.7 billion worldwide, up from \$700 million the previous year faster than other WLAN or WPAN technologies (just think Bluetooth); but it has an Achilles Heel: its limited range. IEEE 802.16, or WiMAX, does have range. A WiMax base station would beam high-speed Internet connections to homes and businesses in a radius of up to 30 miles; these base stations will eventually beam to an entire metropolitan area, making that area into a WMAN and allowing true wireless mobility within it, as opposed to hot-spot hopping required by Wi-Fi). The recent past, however, has not been kind to WMANs: In the late 1990s, companies such as Teligent, Winstar Communications, and XO Communications invested large sums in wide-area wireless broadband networks but ended up filing for bankruptcy. Sprint, too, last fall took a charge of \$1.2 billion to write down the value of radio spectrum it was no longer planning to use for residential wireless broadband service.

WiMAX supporters say the technology will succeed this time around. Equipment is cheaper and appetite for broadband access in areas not served by DSL or cable is greater, while in urban areas the price of the two technologies will be driven down owing to competition from WiMAX. WiMAX, however, must keep an eye on competition from EVDO and worry about the speedy proliferation of Wi-Fi hotspots, which may well blanket entire metropolitan areas

### Library Scan

#### How Digital Is Your Business?"

Book by: **Adrian J. Slywotzky & David J. Morrison with Karl Weber**

Published by: **Nicholas Brealey Publishing, UK**

The biggest, most important issue in business today -becoming digital- touches not only traditional enterprises but the Internet companies as well. Becoming a digital business is not about having a great Web site, setting up separate e-businesses, having next-generation software, or wiring the workforce. It is about using digital technology to become unique to create and capture profits in new ways.

The authors present stories and case studies, some of which are:

- | Profiles of the future: the in-depth story of the digital pioneers - Dell Computer, Charles Schwab, Cisco Systems, Cemex
- | Insight into how to change a traditional enterprise into a digital business: the stories of GE and IBM

## I An analysis of the profitable dot-coms: AOL, Yahoo!, and eBay

## ◆ Lack of choice is what being poor is all about◆

◆ C.K. Prahalad

## IISc Develops Cheap Batteries for EVs &amp; HEVs

***With the help of new technology, the lowly lead acid battery that powers the ignition of conventional cars may make it into hybrid electric vehicles***

For decades, the lead acid battery has dominated the US \$16 billion industrial and automotive markets. But lead has not always led in hybrid electric vehicles, where far pricier nickel metal hydrides (NiMHs) are found under the hood of popular models like the Honda Insight and Toyota Prius. Now a team of researchers from the Indian Institute of Science (IISc), Bangalore, thinks it has found the way for lead acid to match NiMH's performance.

The IISc group has developed a technique for making lead acid batteries substantially lighter, and therefore more energy dense—a key determiner of a battery's usefulness in electric vehicles (EVs) and HEVs. Currently, lead acid batteries have a density of 30 watt-hours per kilogram, but the new process delivers batteries with more than 50 Wh/kg, which is the minimum required energy density for EVs and HEVs, according to A.K. Shukla, a professor in the solid state and structural chemistry unit at IISc.

Switching to lead batteries should drive down the cost of EVs and HEVs, because the battery constitutes about 15 to 20 percent of the total cost for lead battery-driven cars, compared with up to 50 percent for NiMH and lithium-ion battery-driven vehicles.

Most efforts to enhance the energy density of lead acid batteries rely on using lightweight materials in the grids that act as the battery electrodes. In conventional batteries, one grid is made of lead, the other of lead with a lead dioxide coating. They are submerged in sulphuric acid to form the battery. When discharging, current flows from one grid to the other via a chemical reaction that turns the surfaces of both electrodes into lead sulphate. Researchers have tried to make the grids lighter by using lower density metals like aluminum, or plastics such as PVC, and then coating those with lead. These attempts failed because the plastics melted at the typical temperatures involved in making batteries, and the sulphuric acid tended to eat into and disintegrate the grid.

Still, the IISc team thought it could succeed with a plastic substrate. The key was figuring out a way to make the battery without melting the grid and, at the same time, to protect the grid from the acid.

To accomplish that, IISc turned to a technique ordinarily used in the semiconductor industry, but adapted it to work on plastic instead of silicon. The result was a 75 percent lighter electrode. As an added benefit, the process should be less environmentally onerous because it uses much less lead.

A Hyderabad-based company, NED Energy Ltd., has been testing the lab prototypes. They see a lot of potential for this technology not only in EV applications, but also in areas where high power is required for short durations—such as tripping circuits in power plants, complex control circuits in petrochemical plants, and firing circuits in weapons systems.

The IISc researchers claim their battery will see use in both EVs and HEVs. Commercialization is probably three years and about \$300 000 away, with about a third of the funding coming from Govt. of India's DSIR .

The NED-IISc battery will likely see its first use in a developing country. ◆We feel that an interim solution in battery technology for EVs and HEVs is required for a country like India, where it is difficult to think of directly going for sophisticated and costly lithium-ion batteries or fuel cells,◆ says NED's Gaffoor. EV requirements in the West are different from those in India, in terms of vehicle size and speed, level of comfort, and average distance travelled between chargings. For instance, a suitable EV for India would be small and lightweight, without air conditioning or heating. The distance travelled between

chargings would be about 60 to 70 km per day, with a maximum cruising speed of 40 to 50 km per hour, much lower than that required in western countries, explains Gaffoor.

◆ If you want to test a man's character, give him power ◆

◆ Abraham Lincoln

◆ The greater the power, the more dangerous the abuse ◆

◆ Edmund Burke

## IEEE NEWS & EVENTS

### 2004 IEEE Annual Election

The candidates for the 2004 IEEE Annual election have been announced. The list is available on the IEEE web site. For the post of the Region 10 Delegate-Elect/Director-Elect 2005-2006 the candidates are: Jakkampudi A. Chowdary, Marzuki B. Khalid and Janina Mazierska.

*Reported by:* R.Muralidharan  
Chair - IEEE India Council

### National Computing Contest NCC- 2004

In the National Computing Contest NCC-2004 of Nalini Foundation, Pune, held in January 2004, the students of Loyola School, Jamshedpur and students from Interdisciplinary School of Scientific Computing, Pune University came with flying colours.

*Reported by:* Narayen Ugar, Sr Member IEEE

Contest Director

### SENIOR MEMBERS

India Council Congratulates the following 20 distinguished IEEE members from India who have been elevated to Senior members in June 2004.

The last A&A Review Panel meeting was held on 19 June 2004 in Kansas City, MO and 244 new Senior Members elevated.

The next A&A Senior Member Review Panel Meeting will be held on 7 August 2004 in Detroit, MI.

With best regards,

**R.Muralidharan**

Chair - IEEE India Council

Bangalore	<b>Thangavelu Asokan</b>
Bangalore	<b>Ramasubramanian R</b>
Bangalore	<b>Sujata B. Sharma</b>
Bangalore	<b>Jayachandra U. Shenoy</b>
Bangalore	<b>V.V. Srinivasan</b>
Bangalore	<b>Mahesh G. Varadarajan</b>
Bombay	<b>S. D. Haridas</b>
Bombay	<b>Vijay Tulshiram Ingole</b>
Calcutta	<b>Dipak Ray</b>
Delhi	<b>Pankaj Agarwal</b>
Delhi	<b>Satish Nayar</b>
Delhi	<b>Prashant Rao</b>
Delhi	<b>Pinaki Roychowdhury</b>
Delhi	<b>Sandeep Soni</b>
Delhi	<b>Bindoo Srivastava</b>

Gujarat	<b>Sharaschandra Shetty</b>
Kerala	<b>Sagir Abdul Salam</b>
Pune Subsection	<b>Rajendra B. Datar</b>
Pune Subsection	<b>Mangal Hemant Dhend</b>
Pune Subsection	<b>Dinanath N. Kholkar</b>