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CHAIRMAN'S MESSAGE

Dear fellow members,

Congratulations to IEEE Bombay Section!

Bombay section has for the second time won the Region 10 Outstanding Section award - earlier in 1998 and now for 2002. Y W Liu, the Chair of the R10 Awards committee wrote:

"It is my honour to announce Bombay Section is the winner of the 2002 R10 Outstanding Section Award. Bombay Section was doing very well in all fronts in 2002, specially to the membership development effort that resulted in doubling of student members from 2,339 ending 2001 to 5,854 ending 2002."

Bangalore and Delhi sections have also won this coveted award from R10. Let's all hope that the next year's award also comes to one of the Sections in India. It may be a good idea to choose one section among our 10 and prepare them to win it. IC will extend all support for this and this time I urge the section chairs to come forward and offer themselves as the most probable candidate for the award in 2003.

The R10 Director in his message in the March issue of the region newsletter highlighted the importance of the student members and the need to nurture them. I fully support this and almost all of us have been working on this theme. Of late, due to hikes in the student membership rate and other reasons, the student membership is falling in India. We all should work to arrest this and reverse the trend. Any suggestions for this are welcome.

IEEE Communication Society has made a special offer to give free half year membership (Aug. to Dec. 2003) to all active members including Student members of IEEE. All they have to do is fill up a form online at www.comsoc.org/freeoffer. They will receive Communication Magazine for this period and whatever other benefits offered by Communications Society. Please inform as many members as possible as the deadline for joining this scheme is 1 August 2003.

I am very happy to bring to the attention of all a release from the IEEE Standards Association which states that IEEE 802.11b (TM), the most widely used wireless local area network (WLAN) technology, has gotten a long-awaited increase in speed through a new amendment ratified last week by the IEEE Standards Board. The amendment, IEEE 802.11g (TM), raises the data rate of IEEE 802.11b networks to 54 Mbps (megabits per second) from 11 Mbps. The added transmission speed gives wireless networks based on IEEE 802.11b (often called Wi-Fi) the ability to serve up to four to five times more users than they now do. For more information, visit: <http://standards.ieee.org/announcements/80211gfinal.html>. One of the major activities of IEEE has been the Standards effort. A year back a special portal was created for Standards-Asia to bring out the efforts in Asia-Pacific region.

With best regards,

Muralidharan
Mumbai

R.

Chairman

1 July '03
Council

r.muralidharan@ieee.org

"No pessimist ever discovered the secret of the stars, or sailed to an uncharted land, or opened a new doorway for the human spirit"
- Helen Keller

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IEEE HYDERABAD SECTION**

EDITOR'S DESK

'Conscience-The Monitor Within'

We, the human beings are blessed with conscience, an internal monitor always telling us in very subtle terms whether to do an act or avoid it. Some salient aspects of conscience as spelt out by learned people are listed below:

- Conscience is the soundless inner voice that tells us: "Do this action, it is right." It warns us also: "That is wrong, do not do that."
- It is a sensitive balance to weigh actions.
- A guiding voice from within, conscience is a moral faculty or principle by which we distinguish right from wrong.
- Scrupulousness is conscience. It is a silent teacher
- The positive elements that adorn conscience are truth, courage and justice.
- Conscience is a great ledger. All our offences are written and registered in this ledger. It is a terrible witness.
- It warns you like a teacher or a friend, before it punishes you as a judge.
- Conscience becomes blunt or even destroyed through abuse and misuse. It becomes perverted through wickedness. Uttering falsehood and taking bribes destroy the conscience altogether

What is the relevance of conscience in the present context, especially in a globalised economy, where bottom lines are the concern of the people at the helm of affairs in organizations? Most of them are forced to act against their conscience to hide facts, distort figures etc, to present a rosy picture. But, as truth would have it, it is only a temporary reprieve and the true picture would come to lime light in due course, with devastating capabilities. Of late, we have been witnessing several such cases in the global business scene.

We are all born with this powerful inner tool – Conscience. Let us make full use of it in the right way.

N.T.NAIR
Trivandrum
Editor
1 July '03
del@vsnl.com

e-mail:

IEEE NEWS & EVENTS

IEEE Kerala Section

Dr. Narain Hingarani, delivering lecture on Role of Power Electronics in Future Power Systems on 11 June 2003 at Trivandrum.

Power Engineering Society (PES) chapter of IEEE Kerala Section organized a seminar on "Role of Power Electronics In Future Power Systems" by Dr.Narain Hingorani on 11th June 2003 at Trivandrum. Mr. Simon P Varghese, Chairman of PES chapter introduced the speaker and Dr.S. Ashok , Secretary, proposed vote of thanks.

Highlights of Dr Hingorani's presentation:

Power Electronics based on silicon science, following the phenomenal growth in microelectronics also based on silicon science, is at its early stages of fast growth. In generation area it is needed for connection of photo-voltaic, wind power and fuel cells. In the transmission area HVDC is used for long distance transmission and interconnection of systems with incompatible frequencies. HVDC is well established and represents power electronics application in a range of hundreds to thousands of MWs. Now we also have the new technology of Flexible AC Transmission (FACTS) for increasing useable ac transmission capacity, through high-speed control of voltage, current, phase angle and power flow. Since the introduction of this concept about twelve years ago, there has been a definite and sustained progress in understanding of the opportunities offered by FACTS. FACTS concept has caught the fascination of the industry and the academia as a new way of managing the power transmission systems of the next century.

In the distribution area, Custom Power is a concept based on the use of power electronics Controllers at the customer supply point, for the electric utilities or others to supply value-added reliable and high quality power to their customers. The underlying issue is that of the changing need of reliability of power and that an improvement in this reliability requires value-added investment. In fact futuristic industrial parks may well be Custom Power Parks, where all industrial/commercial customers will receive power supply with options of various levels of reliability and quality.

Dr. Hingorani who received the IEEE Third Millennium Medal, is a Life Fellow of IEEE and a member of the IEEE Foundation Board since 1998.

TOP 12 IEEE SECTIONS IN THE WORLD

[By member Strength as of 31 Dec 2002]

	Section	No of members
1.	Santa Clara Valley	15487
2.	Boston	9917
3.	UK & Rep. of Ireland	8547
4.	Bombay	7971
5.	Tokyo	7299
6.	Northern Virginia	6404
7.	Chicago	6366
8.	Washington	5947
9.	Dallas	5739
10.	Germany	5607
11.	Philadelphia	5451
12.	Madras	5240

(As of 31 Dec 2002, there are 248 IEEE Sections around the world)

Compiled by: H. Kalyanasundaram

New Senior Members from India

IEEE India Council congratulates the following 11 new Senior Members, elevated at the A&A Review Panel meeting held on 21 June 2003 in Nashville, Tennessee.

Section	Name
Bangalore	S. Balasubramanya
Bangalore	Shrikrishna G. Kulkarni

Bangalore	Karunakara CP Menon
Bombay	Balkrishna R. Prabhu
Bombay	Gian Prakash
Bombay	Priti P. Rege
Delhi	Dwarkadas P. Kothari
Gujarat	Desai M. Dahyabhai
Gujarat	Kankar S. Dasgupta
Hyderabad	Subir K. Chaudhuri
Kerala	R.Sreerama Kumar

With best wishes from:
R. Muralidharan
Chair - IEEE India Council

News - Scan

Biotechnology Companies

America leads the world biotech industry with 1466 companies, accounting for almost three-quarters of global revenues. Canada follows US with 410+ Cos, Germany (350+), Britain (320+), France(240+), Australia (210+), Sweden (180+), Switzerland(130+) and India (60+). The Indian biotechnology market was estimated to be \$2.5 billion in 2002, with the main segments being agriculture, therapeutics, diagnostics, chemicals and environment.

Computer bugs

The term computer bugs refers to programming flaws - commands that don't accomplish the desired result because computers have a habit of following the letter rather than the spirit of the instructions handed to them. The cost to customers of these flaws is estimated as \$38 billion a year.

Computer bugs have been around since malfunctions in a 1945 Mark II computer were blamed on a moth trapped in a relay. Some of the great bugs reported:

- 1962 – The unmanned Mariner rocket veers off its course to Venus because of a faulty line of Fortran code. NASA blows it up five minutes into flight to avoid endangering lives on the ground.
- 1991 – A U.S Army barracks in Dhahran, Saudi Arabia is hit during the gulf war by an Iraqi SCUD. A glitch in the clock of the Patriot missile system led to a failure to intercept the missile.
- 1995 – Denver International Airport's opening is delayed for over a year. Bugs in the baggage system cause suitcases to get chewed up. Carts crash into walls.
- 1997 – The USS Yorktown is immovable for nearly three hours off the coast of Virginia. Software tried to divide by zero, crashing the operating system of the Aegis missile system
- 2002 – Slammer, the fastest-spreading worm in history, exploits a bug and interferes with Internet service in South Korea and ATMs across the United States. (Courtesy: Forbes, May26, 2003)

Indian IT Market – Over the Years

Year	Turn-over (Rs Crores)	% Share of GDP
1997-'98	18,641	1.22
1998-'99	25,307	1.45
1999-'00	36,179	1.87
2000-'01	56,592	2.66
2001-'02	65,788	2.87
2002-'03	79,337	3.15

[Estimated]

Note: IT includes hardware, peripherals, networking, domestic and export market for software & services and IT- enabled services.

(Source: NASSCOM)

Technology in brief

Sensors Generating Electricity – Indian Initiative

Scientists at Raman Research Institute and IISC, Bangalore have developed carbon nano-tube flow sensors that can work as energy conversion devices, a finding that promises enormous applications in the biomedical field.

These tiny sensors when placed in a flowing environment produce a voltage/current. By putting them in a biomedical environment, the voltage/current can be used for body's therapeutic purposes. The sensors do not incorporate any moving parts and are considered a possible advance for the lab on a chip. The flow of a liquid on single-walled carbon nano-tube bundles (SWNT) induces a voltage/current, magnitude of which depends sensitively on the ionic conductivity and the polar nature of the liquid. The sensor can be scaled down to length dimension – microns, the length of the individual nano-tubes, making it useable in very small liquid volumes. It also has high sensitivity at low velocities, a fast response time, and can detect very small velocities. (Source: Search, May 2003)

Computing's Big Shift:

Reconfigurable Chips

With light-speed agility, an experimental chip in a QuickSilver Technology laboratory, USA, fluidly executes the three distinct tasks of conducting a cellular phone call. The chip searches for a local cell site, verifies that the caller is an authorized network user and then puts the call through.

It may sound as mundane as phoning home. But to a growing school of chip designers, the three-step feat exemplifies the most fundamental change in computing in decades. Today's cellphones require three different chips to perform the same tasks that the single QuickSilver prototype can execute — thanks to an emerging type of chip architecture known as adaptive, or reconfigurable, computing.

"Until now, the hardware had to match the problem," said Paul Master, QuickSilver's chief technology officer. "Now we can change that."

Under this new approach, software is able, on the fly, to effectively redraw a chip's physical circuitry. Not only can adaptive computing enable a single chip to perform tasks normally requiring several, it can add speed while saving cost and energy when compared to today's conventional static chips in which circuitry is inflexible.

"We're coming upon a sea change in the world of semiconductors," said Nick Tredennick, a technical adviser to QuickSilver who was the designer of the Motorola 68000 microprocessor, which powered the Apple Macintosh in the 1980s and early 90s, and is now the editor of the Gilder Technology Report newsletter. "There are compelling advantages to reconfigurable chips in terms of performance and power consumption."

The adaptive computing movement is not limited to the several dozen start-ups that have entered the field, like QuickSilver and GateChange Technologies, a Bethlehem, Pa., company. Industry giants including Intel, IBM, Infineon Technologies, Motorola and Texas Instruments all have their own efforts under way in one or another facet of reconfigurable chip design.

The possibilities beyond cellphones that might work anywhere in the world could include portable computers that would seek out the most suitable radio frequency and wirelessly and automatically connect to the Internet, or consumer electronics gadgets that stave off obsolescence by being able to adjust to each new technical standard in digital sights and sounds. For a consumer, updating hardware might be as easy as downloading the latest circuit design from the Internet.

For decades, logic chips — whether the multifaceted microprocessors that serve as the central nervous system of a PC, or the single-minded drones that decode digital music in a CD player — have relied on fixed circuitry. On these conventional chips, all software instructions flow through pathways that are etched into silicon when the chip is made.

This fixed-circuit approach has served the industry well, but the inflexibility of the design can lead to inefficiencies that become more pronounced as the demand for processing speed and power increases. And because the template, or mask, for etching circuitry onto a chip can cost \$1 million for each newly designed chip, the fixed-circuit tradition has made it difficult for product designers to quickly adapt to changing markets and technology formats.

In adaptive computing, by contrast, the wiring of chips can effectively be reconfigured on the fly, as software instructions tell each of hundreds of millions of logic gates whether to open or close, altering the circuitry's information pathways.

Advocates of the approach say reconfigurable chips may offer speed, cost and energy-saving advantages, and allow for quicker product design cycles than conventional fixed-circuit chips. And the ability to combine the functions of many chips into one would be particularly desirable in making smaller, lighter and more energy-efficient portable computing and communications devices.

One example might be a significantly cheaper, consumer-oriented global positioning system, or GPS receiver. The system would use a single chip to first find the GPS satellites, then shift to the tasks of mapping, route-finding and displaying the information.

The concept of configurable chips is not totally new. For the last 17 years, chips known as field programmable gate arrays, or FPGAs, have served as blank slates on which programmers can use software to define circuits while developing new computing and electronics products — without having first to design totally new chips. FPGAs accounted for \$9 billion of the \$24.3 billion global market for logic chips in 2002, according to the Semiconductor Industry Association. But once programmed, FPGAs can be reprogrammed only with great difficulty, compared with adaptive computing chips.

To be sure, adaptive computing is still a controversial concept, one greeted skeptically by some of Silicon Valley's leading computer designers.

So far, most of the interest in the technology is among academic researchers who need to quickly test their ideas, said David R. Ditzel, a longtime computer designer who is the founder of Transmeta, a maker of Intel-compatible microprocessors. "It sounds like an intriguing idea, but it's not clear what the applications will be to make it commercially viable," he said.
(Courtesy: JOHN MARKOFF)

Electron beam emitters –A low cost avatar

Electron beam emitters produce a broad beam of electrons which can be used to perform a number of vital functions in industrial and manufacturing processes. Electron-beam technology, in various forms, has been around for decades. The cathode-ray tube in a TV, for example, creates pictures by rapidly scanning streams of electrons in a vacuum across the phosphor-coated glass screen. Giant, expensive e-beam emitters, some as tall as two-storey buildings, are used in about 1,000 locations around the world for printing, creating advanced plastics, and sterilizing medical equipment. Conventional electron beam machines employed for industrial purposes include an electron beam accelerator that directs an electron beam onto the material to be processed. The accelerator has a large lead encased vacuum chamber containing an electron generating filament or filaments powered by a filament power supply. During operation, the vacuum chamber is continuously evacuated by vacuum pumps.

Although E-beams have a number of advantages over possible alternatives, they have historically suffered from the major commercial disadvantage that the systems were large, expensive, and complex to maintain. Typically, the systems cost in excess of \$1 million.

In particular, E-beam systems have, until now, required vacuum pumping equipment, large high voltage power supplies and complex shielding, as well as in-plant engineering and maintenance expertise. As a result, it has not been easy or sometimes possible at all to integrate the systems into manufacturing equipment.

The commercial potential of electron beams was first recognized in the 1970s, but this potential could not be realized widely until Advanced Electron Beams Inc.'s (Wilmington, Mass., USA) leap forward in emitter design. AEB's patented electron beam emitter is a compact device about the size of small water cooler. The device generates a beam of free-flowing electrons that represents a jump in e-beam technology that has been similar to the technological advancement from mainframe computers to laptop computers. AEB has developed a simple and ingenious e-beam emitter in a sealed unit. The technology is scalable and can be used to produce emitters in a variety of sizes. Presently AEB produces a 10-inch model, which can be aligned in multiples to produce a beam of any desired width. This unit has an operating voltage of 80-150kV.

Library Scan

"Fun Works"- Creating places where people love to work

Book by: Leslie Yerkes

Published by: Berrett-Koehler Publishers Inc.,
San Fransisco www.bkconnection.com

Leading edge organisations have discovered that fun, both as a value in corporate culture and as a set of behaviors in daily practice, can translate into bottom line success. By harnessing the power of fun, companies find they can better retain employees and customers, motivate teams, improve productivity, increase innovation, and create a sense of community.

Drawing on some success stories, Yerkes illustrates the eleven principles of what she calls the "Fun/Work Fusion". The intention of 'Fun Works' is to challenge our feelings and beliefs that fun should only exist after the work is completed, that fun is silly, superficial, and unprofessional; that fun is taboo in the workplace. The book aims at illustrating vividly that there are many people, and entire companies, who daily experience the joy of fun at work while creating impressive results.

"Anyone who has never made a mistake has never tried anything new"

- Albert Einstein

"Never stand begging for what you have the power to earn"

- Miguel de Cervantes

"Don't look only under the light, for your lost keys."

- Dick Morley,

Inventor of the PLC

Administrivia:

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Send your comments about this page, to : s.gopakumar@ieee.org

This page, developed and maintained by: S.Gopakumar
