ceasa
THE CLINICAL ENGINEERING ASSOCIATION OF SOUTH AFRICA

CEASA NATIONAL NEWS
JANUARY -MARCH 2010

Objectives:

- Technology
- Feedback
- Participation
- News

CEASA.

The Voice of Clinical Engineering in South Africa

2010, HERE WE COME!

Many people say that the older you get, the quicker time goes by. I am sure that many of the CEASA members will agree with me when I say that I must be getting long in the tooth, because of the speed that life goes by. I am sure that many of the younger guys with less white hair will also appreciate this fact.

Although the year is already well in progress, may I wish all of our members all of the very best for what is left of 2010. The year has certainly kicked off with a bang, and most of you have already forgotten the holiday at the beach!

I think that we can certainly look back at a very successful year at CEASA for 2009. The Gauteng and Western Cape branches are very active, and the good news is that the KZN branch was re-activated during the past year, and from all reports there certainly is a good spirit at the Shark tank, and promises to be a very active branch again. Thanks to everybody that played a role to re-establish this branch, and also everybody that keeps the other branches running well. We realize that this is all voluntary work, and that you have to do all the CEASA activities between your normal workload. Your efforts are well appreciated.

The year 2010 looks to be a very promising one for CEASA. Normal branch activities are already planned nationally. Please play an active role by attending all the activities that are arranged. We certainly need all the support we can get from our members. We have a very good relationship with SAFHE, and we welcome SAFHE members to attend our meetings as well. We hope we can carry this relationship through during

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the next few years.

Allow me to thank Freddie Gouws for the initiative taken to publish this newsletter. We really appreciate the effort he has put into it already, and would appreciate any input from our members to make the publication successful. Please contact Freddie with interesting topics and publications that you want to be placed in the newsletter.

Please visit our website, www.ceasa-national.org.za, where all activities are advertised, and feel free to contact any of the Council or Committee members for more information.

Hendrik Radyn
President: Clinical Engineering Association of South Africa

TECHNOLOGY UPDATES

ECG Necklace Monitors—Cardiac Performance in Daily Life

A prototype electrocardiogram (ECG) necklace, which enables long-term monitoring of cardiac per-formance and allows patients to continue their routine daily activities while under observation.

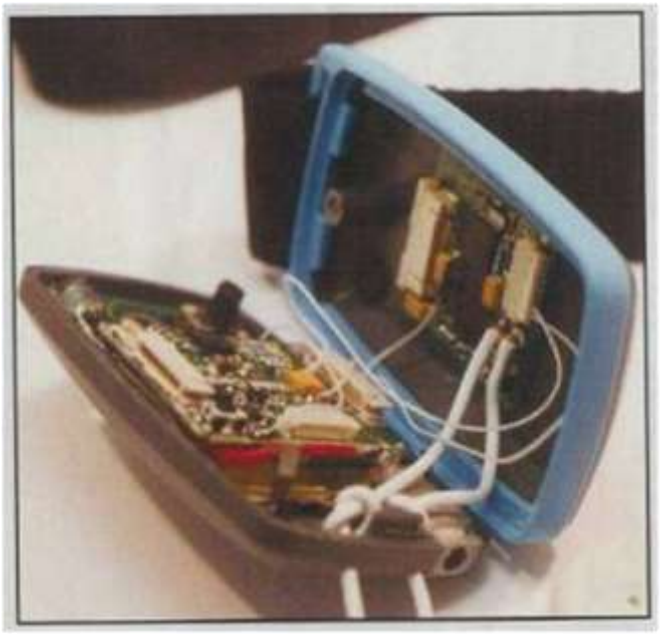

*Image: The **EGG** necklace (Photo courtesy of Interuniver-sity Microelectron-ics Genter).*

Developed by researchers at the Interuniversity Microelectronics Center (IMEC, Leuven, Belgium; www.imec.be) and its research affiliate the Holst Center (Eindhoven, The Netherlands; www.holstcentre.com), the ECG necklace is easy to use and characterized by a low power consumption, which ensures a full week of autonomy. It contains a proprietary ultra-low power analog readout application-specific integrated circuit (ASIC), and relies on a low power commercial radio microprocessor platform. A wavelet-based heart beat detection algorithm is embedded in the processor that ensures accurate computation of the instantaneous heart rate, even under a high level of ambient noise. *A second ultra-low Dower microcontroller unit controls the wireless transmission of the ECG data to a computer within a range of 10 meters; an optional memory module enables data logging for applications in which the receiving computer is not nearby.*

The embedded beat detection algorithm has been optimized for robust heart beat detection, and copes

Patient: "Doctor, I think I need glasses." Teller: "You certainly do! This is a bank."

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with baseline wander, electromyogram (EMG) and motion artifacts, and high and variable electrode impedance. Heartbeat is detected with just one sample resolution. The algorithm achieves best-in-class performances, with 99.8% sensitivity and 99.77% positive predictivity, and satisfactory performance is achieved down to a level of OdB SNR (signal to noise ratio). The inno-vative necklace was presented at the IEEE Engineering in Medicine & Biology Conference (EMBC), held during September 2009, in Minneapolis (MN, USA).

With thanks to Mr J. van Roon for his "Technology Update" conributions.

IMPLANTED ANTENNAS DESIGNED TO MONITOR THE HUMAN BODY

In-body medical devices such as pacemakers that use radiofrequency (RF) transmission may in future be equipped with implanted fiber optic antennas. Researchers from Queen Mary University (London, Ukj), the UK National Physical Laboratory (NPLj Teddington, UK and SeikohGiken (Matsudo City, Japan), have developed a prototype implantable radio frequency identification (RFID) tag made up of a Planar inverted F-antenna (PIFA) microstrip antenna that has been optimized to operate while embedded inside the human body. The device, which in essence is a very small RF-optical converter that reproduces the RF signal in, full, has a minimal effect on the antenna performance. The antenna was tested in an artificially fabricated three-layer structure representative of skin, fat, and muscle; when comparing a hookup to both a standard coaxial cable and a fiber optic set-up, the results showed that the use of the fibre-optic system could significantly decrease measurement errors by as much as 18 decibels (dB), by removing the effects of cable reflections, most notably the radiation of common mode current. The system was put to the test by the body-centric wireless sensor lab (BodyWiSe) at Queen Mary University.

"This breakthrough could help the development of the next generation of miniature In-body technology designed to save even more lives," said NPL's principal research scientist Martin Alexander, Ph.D. "Electrically small antennas for wireless communications applications can excite common mode currents on coaxial cables, producing unwanted radiation and with it distorted transmission results". (Source: Hospimedica)

"This breakthrough could help the development of the next generation of miniature In-body technology designed to save even more lives,"

WELCOME TO OUR NEW GAUTENG COMMITTEE MEMBER: MOHAMED BERA

FG:**When did you join CEASA?**

MB: I joined as a student in 2000 or 2001 and rejoined in 2009.

FG:**When were you appointed member of the CEASA committee?**

MB: Dec 2009

FG:**How long now have you served as Regional Engineering Manager- Inland at Life Healthcare?**

MB:1 year and counting.

FG:**Which areas of the inland base and aspects of the group do you oversee possibly making mention of your responsibilities in this regard?**

MB:Life Healthcare is seperated into 2 super regions i.e. inland and coastal. Inland is made up of 32 acute hospital, 4 rehabilitation units and 7 Life Esidemeni Sites. As regional engineering manager in Life healthcare I am resposible for all high level Clinical and Operational engineering (maintenance) matters. I'm responsibile for various things that include drafting group engineering policy , strategic planning and capex sign-off. We also assist hospital managers and hospital engineering & technical staff where required.

FG:**Could you tell us of your past experience in the industry?**

MB: I'm a TUT CE graduate. I started working at Life Healthcare as a student CE. Over the last 10 years I have had the priviledge of holding various positions within the company which included CE & Services Manager at Life Brenthurst Clinic, as well as Services Manager at Life Flora Clinic.

FG:**And definitely, our readership would sincerely appreciate hearing of your hobbies, interests and a little of your background!**

MB: I grew up in the Modimolle (Nylstroom) in the Waterberg. I am married with 1 child and now live in Joburg. I play/watch most sports with a special interest in cricket.

Mohamed Bera
Regional engineering manager– inland at Life Healthcare

PHILLIP'S 10 CENTS' WORTH... A WELCOME BY PHILLIP WILMOT

Compliments of the season to one and all for 2010, the Year of Africa and South Africa to prove we can do it! Well, I also feel, this will be our approach for CEASA this year. We have started this year with a bang and have had some great engaging meetings with T.U.T. and SAFHE on the way forward for 2010. Our first Training meeting has been planned with Fluke Test Equipment as the main topic, hosted by T.U.T., thanks to Prof Jimoh Andisa, HOD for Electrical Engineering. This is sponsored by Glenmed, the local agents of Fluke, ably assisted by Medsci.

I would like to thank all those who have been part of CEASA in 2009 and certainly hope we will see you and more of your friends and colleagues in 2010. I would also like to thank the committee for their support. The 2010 committee comprises of Paolo Boschetti, Leonie Ewald, Lizanne Heyns, Erich Kersten, Riaan van der Watt, Dusan Simovic, Rodger van der Bank, Mohammed Bera, Robin O'Reilly (SAFHE) and myself. I would also like to thank Julie Webber, our administrator, for her continued efforts in arrangements and admin support, without her we would have failed.

Cape Town is hosting their Golf Day on 19 March 2010 at Bellville Golf Club- in Cape Town. **I am sure this will be as good if not better than the Gauteng event of 2 years ago.** This will be alternated between north and south on the years between the SAFHE / CEASA

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CLINICAL ENGINEERING PROGRAMME AT THE TSHWANE UNIVERSITY OF TECHNOLOGY

The Tshwane University of Technology (TUT) is a proud product of South Africa's first decade of democracy. While the size and scope of this dynamic new institution impress, the quality of its teaching, research and community engagement is what makes the University really stand out.
TUT was established on 1 January 2004, with the merging of the former Technikon Northern Gauteng, Technikon North-West and Technikon Pretoria. At the time of the merger, the uniquely South African institutional designation of "technikon" was dropped in favour for the internationally accepted "university of technology" designation. This new mega-institution annually enrols approximately 60 000 students. Its student body is one of the most demographically representative in the country in terms of both race and gender, reflecting the Rainbow Nation in all its diversity. With almost 22 per cent of contact students accommodated in residences, the University is by far the largest residential higher education institution in Southern Africa.

DEPARTMENT OF ELECTRICAL ENGINEERING

This is the largest department in the Faculty of Engineering and the Built Environment with student population of about 4000. The department offers programs at both the undergraduate and postgraduate levels. The Clinical Engineering programme is offered in this department. The purpose of the program qualification mix (PQM) of the department is to train and qualify top-quality technicians, technologists and engineers in the field of electrical engineering. Provision is made for students to orient themselves towards a particular field of specialisation. Our curricula are designed to meet the core requirements/underpinning knowledge of mathematics, science and technology to be applied in the electrical engineering disciplines of:
Clinical Engineering
Digital Technology
Electronics Engineering
Power Engineering
Process instrumentation
Telecommunication Engineering

CLINICAL ENGINEERING: FIELD DESCRIPTION

A career in Clinical Engineering relates to the maintenance, implementation and management of electrical and electronic equipment used in hospitals for the medical care and treatment of patients. The career involves finding solutions to engineering problems and the implementation and maintenance of medical equipment, by applying sound scientific and technical knowledge and mathematical skills.

At the National Diploma level, the Clinical Engineering qualification includes experiential learning components in industry through appropriate cooperative agreements with both the Clinical Engineering Training Centre at Steve Biko Pretoria Academic Hospital, and specific companies in the industrial and service sectors all across South Africa.

The purpose of the National Diploma: Engineering: Electrical includes the following:

- Use and interpretation of mathematical formulas used in engineering calculations.
- The ability to perform statistical analyses by using standard methods and evaluation.
- Interpretation and evaluation of results.
- Use of basic scientific principles in engineering.

- Engineering science applicable to the appropriate sub-discipline.
- Knowledge that addresses the target industry's specific needs.
- Formative education, which includes critical cross-field outcomes through a cooperative education system in which full integration of experiential learning in a real-life industrial environment complements the independent academic, classroom and integrated laboratory work.
- Development of manipulative and functional skills.
- Development of a culture of self-learning and the continuing acquisition of knowledge and skills that are necessary to perform in a developing work environment.
- Solution of real and industrial problems through the application of currently known technology.

Integration of technical knowledge and skills to develop thinking skills that equip the learner to achieve the desired results through the qualification.

The department places the most emphasis on the training of qualified and highly skilled technicians at the National Diploma level to meet the growing need in industry.

On completion of studies, leading to an award of a National Diploma: Engineering: Electrical qualification, after three years of study, a student may choose to complete a further year of study, to receive a Baccalaureus Technologiae: Engineering: Electrical degree, with Clinical Engineering as the area of specialization.

Students who wish to take their Clinical Engineering studies further also have an option of enrolling for a postgraduate degree at the Magister Technologiae and Doctor Technologiae level. The Graduate School in Electrical and Electronic Engineering (GSEE) currently coordinates all postgraduate qualifications (M Tech, MSc, D Tech) and it is managed by the Department of Electrical Engineering at the Pretoria Campus.

At the postgraduate level, the department has, in the last two years produced two Clinical Engineering graduates at the Masters Degree level. Francois Kabeya did his research on the "Development of a Multi-function Exercise Apparatus for Effective Rehabilitation of Cardiac Able- and Disabled Patients. His design, which has already been patented, scooped 1st prize at the 2009 TUT National Innovation Competition. Timothy Okhai, A Clinical Engineering lecturer at TUT, did his research on the "Design, Development and Testing of Thermo-active Oncology Probes". His main area of focus was cryotherapy and radiofrequency ablation therapy. His research output from this study include a book (published in Germany), a chapter in a book (published in Denmark), two international conference papers, and a journal article. He is currently working towards a doctorate degree in Clinical Engineering.

All the qualifications currently offered by the Department of Electrical Engineering at the Tshwane University of Technology, including the Clinical Engineering programme, are fully accredited by the Engineering Council of South Africa (ECSA), as well as the South African Qualifications Authority (SAQA). After a student has completed his or her studies, he or she may apply for professional registration at ECSA. Registration with ECSA gives the qualification international status and recognition in other countries through the current Sydney and Dublin Accords.

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THE CLINICAL ENGINEERING ASSOCIATION OF SOUTH AFRICA

AND

SAFHE - South African Federation of Hospital Engineering

Golf Day 2010

We would like to invite you to a fun Golf Day…

Venue:	Bellville Golf Course
Date:	Friday the 19th of March 2010
Time:	Tee Times from 11h30 onwards
Cost:	R250 per player = R1,000 per 4-ball
Format:	4-Ball Alliance, 2 scores to count and all 4 on par 3's

Your Entrance fee includes your Golf, Dinner afterwards, refreshments on the course and potentially loads of prizes. We would like to encourage each 4-ball to enter at least 1 player of beginner/hacker/novice or high handicap level.

As you are aware CEASA and SAFHE are associations for Healthcare professionals involved in the design, maintenance, management, support, development and assurance of healthcare technology and facilities.

Being non-profit associations we would like to invite companies and individuals to bring their full support to the CEASA/SAFHE Golf Day by accepting the opportunity to be a Sponsor. Any profit made on the day will go towards the funding of previously nominated young technicians' educational fees.

To obtain a booking form for this prestigious event, as well as banking details, please contact Chris Goslin—event manager- noted below.

RSVP

Chris Goslin – Golf Day Organiser

Mobile: 082 373 3548

Email: chrisgoslin@mweb.co.za

Fax: (021) 592 2468

CEASA NEWS

For any queries regarding publication please contact:
Freddie Gouws
+27(0)73 655 5863
FreddieGouws@vodamail.co.za

We're on the Web!

www.ceasa-national.org.za

The Voice of Clinical Engineering in South Africa!.

The objectives of the Association are fully de-fined within our Constitution, however some key fundamentals are:

1. To encourage and promote the personal and professional growth and development of all our Clinical Engineering members.

2. To further reinforce and elevate the Clinical Engineering professional seen by all healthcare professionals.

3. To strive for continued Clinical Engineering excellence and partnership within all healthcare provision environments.

4. To directly represent all levels of the clinical Engineering profession within the engineering council of South Arica.

5. To foster and establish international links and cooperation surrounding standards development and all aspects of Clinical Engineering.

We are involved in the planning of ongoing educational meetings, programs and interaction with other healthcare professionals and their Associations,

For employment opportunities as well as training and courses, please visit our website on www.ceasa-national.org.za.

Upcoming Events:

Gauteng:

- CEASA Meeting at TUT, Pretoria, 16 Feb 2010.
- CEASA Adcock Ingram/ Netcare @ 15:30, 4 May 2010
- CEASA TUT @ 15:30, 10 August 2010
- CEASA Adcock Ingram/ Netcare @ 15:30, 12 October 2010.

Western Cape:

- CEASA Golf Day– Cape Town: 19 March 2010 at the Belville Golf Course
- Medsparks Meeting,25 Feb 2010 in Cape Town

National:

- Health Technology Africa Exhibition, Sandton Convention Centre, Jhb, on

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Congresses, so CEASA will have a big event each year, alternating north and south. When golf is Coastal, the congress is inland. A little bit of fun for all around the country.

Gauteng will also be hosting another breakfast in the mid to latter part of the year with big surprises of guest speakers. CEASA National will also be revisiting the day training seminars around the country as was in late 2008. This was a huge success as well.

I would like to urge all interested friends of CEASA, members or not, to submit information to Freddie on Freddie-Gouws@vodamail.co.za for possible publication. This CAN include adverts for jobs, product launches, promotions, occurrences on the go, jokes, etc, and some will be billed at very nominal rates as per the local committee as applicable.

Many thanks and looking forward to a wonderful 2010. Please feel free to contact me for anything of interest or concern.

Phill

Cell : +27 (0) 83 701 9105

phillip@haemotec.co.za

Phillip Wilmot, CEASA Gauteng Chairman

A man walks into a Doctors. He has a cucumber up his nose, a carrot in his left ear and a banana in his right ear.
"What's the matter with me?" he asked.
"You're not eating properly." replied the Doctor.

The Joke Box!

"Doctor, I've had problems with silent gas emissions. At home, work, or at church I get lots of silent gas emissions. As a matter of fact I've had three sitting here talking to you. What are we going to do?"
"The first thing we're going to do is check your hearing"

A man goes to doctor and says:
'Doctor, I have a problem. When I drink tea, my eye aches(sp?) and when I stop, it stops too. Can you help me?'
Doctor says:'Take the spoon out of the cup!'

"Doctor, Doctor, You've got to help me - I just can't stop my hands from shaking!"
"Do you drink a lot?"
"Not really - I spill most of it.

What's the best thing about having Alzheimer's Disease?
You can hide your own Easter eggs.
You are always meeting new people.
You never have to watch reruns on television.

With thanks to Rodger van der Bank