engmednews

NEWSLETTER OF BIO-MEDICAL ENGINEERING SOCIETY OF INDIA

OPEN FORUM : CLINICAL ENGINEERING

Readers have shown keen interest and concern about Dr. Niranjan Khambete's article on Clinical Engineering, selected responses are :

I enjoyed reading the recent issues of "engmednews". The report on Clinical Engineering is most important. It is well known that India remains heavily dependent on imported instruments in health care and we have no component industry either. Our record in innovation is poor because India had 3 US patents for medical equipment against 4997 of US and 882 of Japan in 2003. No wonder the Sikka Committee of the Indian National Science Academy recommended a national project in the Mission mode for medical instrumentation, the demand for which, according to UK Trade and Investment, stood at Rs. 6,500 crores in 2001. While the R&D effort needs to be pursued vigorously, it is equally important to pay attention to HRD in clinical engineering. In this context, BMESI should persuade the INAE to hold a Seminar of stakeholders on a 2 tier programme for training clinical engineers on the US model and evolve suitable recommendations for India. This would hopefully be welcomed by IITs and AICTE in formulating their training policies.

<msvaliathan@yahoo.com> **Prof. M.S.Valiathan,**
Hon. Advisor, MAHE, Manipal

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As somebody with a long term interest in Clinical and Biomedical Engineering in India I am very happy to lend my support to the views expressed by Dr. Khambete in the recent issues of ENGMEDNEWS. I was based at the Advanced Training Institute for Electronics and Process Instrumentation in Hyderabad during 1977-78 and with the help of ILO set up some basic training courses for Medical Engineers. A major problem, in my opinion at the time, was the absence of a Clinical Engineering profession within the Indian health care system. My current feeling is that, notwithstanding the long time since 1978 and the various proposals for international co-ordination of training programmes in this area, India is big enough to produce its own protocols and to get central support for a professionally supported training programme in Clinical Engineering. India is very much better placed now than it was 30 years ago. There is so much industrial growth and enthusiasm. It seems to me that growth in the health care sector must follow the general rise in the economy. However, having said that India can 'go it alone' I am also very much in favour of international exchanges and taking account of the schemes set up in Europe and the USA.

If Clinical and Medical Engineering are to thrive then you need well qualified engineers actually employed within the healthcare environment. Only then can they interact with medical staff and see the real problems whose solutions might change medical practice. You need medical engineers to match the advances taking place in science and technology to the actual problems in health care. It is indeed accepted in the UK that the role of the clinical scientist includes not only managing the use and maintenance of medical equipment but also being involved with research and the development needed to change methods of diagnosis and treatment.

Graduate professionals need to take the lead in building a Clinical Engineering profession but it is also true that the role of technicians must also be considered. Their role is equally important and in the UK the IPEM recognises this by operating separate training routes for clinical scientists and clinical technologists in health care.

I hope my comments are of interest. It does seem to me that it is right time for Biomedical Engineering to flourish in India. With best wishes.

<b.h.brown@sheffield.ac.uk> **Prof. Brian Brown**
Professor Emeritus,
University of Sheffield, UK

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The matter is very very important, I will appreciate if the matter is takenup with the appropriate authority.

<gd.jindal@gmail.com> **Dr. G.D.Jindal**
Scientist, BARC,
Vice-President, BMESI

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Regarding Clinical Engineering / Hospital Engineering, we should try to understand the needs of our country and then think Bio Medical Engineering vis a vis Clinical Engineering. We should have Symposia / Workshops on this with Hospital authorities."

<spalbme@yahoo.co.in> **Dr. Subrata Pal**
Founder Director and Professor,
School of Bio-Sciences and Engineering,
Jadavpur University, Kolkata.

SUMMERY OF A RECENT Ph.D. THESIS AT IITB

"Novel Transform Methods for Processing Sequences of Images in Magnetic Resonance Imaging (MRI)"

Magnetic Resonance Imaging (MRI) is a non-invasive diagnostic tool for medical analysis. There are two specialized MRI applications which are still in the research phase, namely functional MRI (fMRI) studies of the brain and tagged cardiac MRI. In both fMRI as well as cardiac tagged MRI, images are recorded with respect to time, and it is the functional aspect that is important, in addition to the instantaneous spatial information in these MR image sequences. Therefore, in our thesis we have discussed some novel transform methods for processing sequences of images in MRI; specifically fMRI and cardiac MRI.

fMRI is based on the Blood Oxygenation Level Dependent contrast (BOLD) and can be used to model the haemodynamic response of the brain. The fMRI signal indicates the blood flow and oxygenation. The fMRI signal has, however a very poor signal to noise ratio. We have proposed the use of the periodicity transform and wavelets in fMRI. The Periodicity Transform decomposes a data sequence into a sum of simple periodic sequences by projecting onto a set of periodic subspaces, leaving residuals whose periodicities have been removed.

Analysis of tagged cardiac MR images is very crucial in determining strain pattern within the myocardium. This helps in pre-diagnosis of common cardiac ailments. One of the recently introduced methods for quantifying the deformation and motion of heart is the Harmonic Phase (HARP) MRI. An important step in HARP MRI involves extraction of a spectral peak from the k-space data to obtain the HARP images. The geometry of the spectral peak is related to the motion and deformation of the heart. Therefore, it is important to extract the location as well as the changes in the corresponding tags for every frame in cardiac MRI. We have investigated the application of the Discrete Wavelet Transform (DWT) for the identification and extraction of tags.

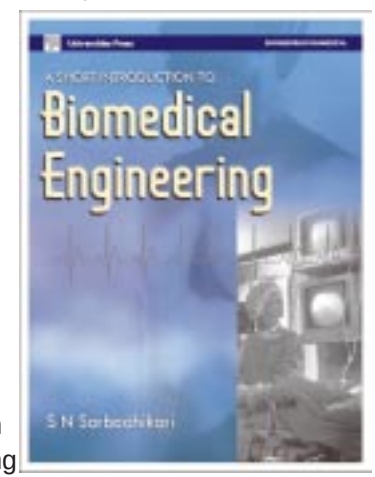
MATLAB programs for detecting the fMRI activation signal using the periodicity transform approaches are ready in their final form. Clinically these algorithms were tested and verified on the finger tapping data. In case of the Cardiac MRI, our method could be used to obtain the harmonic phase images (HARP) using the DWT based approach. Tag identification from the Spatial Modulation of Magnetization (SPAMM) MR images of the heart is possible. For more information please contact :

<ajayd1967@yahoo.com> **Dr. Ajay V. Deshmukh,**
Dept. of Instrumentation, VIT, Pune

<vmgadre@ee.iitb.ac.in> Supervisor: **Prof. V. M. Gadre**
Electrical Engg. Dept., IIT Bombay

NEW BOOKS

Dr.S.N.Sarbadhikari's book, "A Short Introduction to Biomedical Engineering" is published by Universities Press (Orient Longman), Hyderabad, 2006. Forward to the book is written by Prof.Sujoy K.Guha, Chair Professor in Biomedical Engineering



at Indian Institute of Technology and National Institute of Medical Sciences and Technology, Kharagpur.

"Medical care today is an integration of biomedicine, physical sciences, and technology. Every aspect of diagnosis, therapy and rehabilitation draws upon knowledge and techniques from all these areas. To present the state-of-art practices in such a multidisciplinary field requires an in-depth perception of biomedicine and engineering - a very challenging problem. Dr. Suptendra Nath Sarbadhikari, with his unique training as a medical doctor, physiologist and biomedical engineer, has in an exceptional manner addressed this issue.

A Short Introduction to Biomedical Engineering covers a very wide range of topics, but in a concise manner, on account of the special emphasis on synthesis of concepts from different areas of medicine and technology. Basics of measurements in medical practice have been dealt with, giving it a holistic approach. Therefore, the reader will have a panoramic view of the subject, as well as, details about the technologies involved. Moreover, with his background as a medical doctor, Dr. Sarbadhikari has very critically projected the optimal application of each technique and equipment, giving their advantages, limitations, and most significantly, the implications in clinical use. The presentation is in a fast-flowing and interesting style, which will serve the needs of both medical doctors and technologists desirous of getting an overview, and also of students taking courses in the field of biomedical engineering. A glimpse of the emerging future trends in biomedical engineering also evolves from the text and stimulates thinking, as well as further reading."

<guha_sk@yahoo.com> **Prof. Sujoy K Guha**

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Prentice Hall of India has recently published a book "Electronics in Medicine and Bio-medical Instrumentation" authored by Dr. Mrs. Nandini Jog. *(ISBN-81-203-22926-0, Rs. 195/-) The details of the book can be obtained from www.phindia.com.*

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Events - Past and Forthcoming

NCBME 2006

The first National Conference in the history of Sardar Patel College of Engineering was held on 28--29 March, 2006.

The conference commenced with a fascinating keynote address by Dr. Narendra Nair, MD. Head, Radiation Mediation Centre, BARC. He spoke on Evolution of Medical Imaging, starting from X-rays to PET. It was attended by 300 members comprising of invitees, delegates, academicians, and students. Dr. Nair held the audience spellbound for one and half hour.

This was followed by two parallel sessions where 14 papers were presented. The poster session was followed by 14 more oral presentations. On the 29th of March, 2006 Dr. Shoaib F. Padaria MD. DM (Card) FACA (USA) delivered an invited lecture on Laser Applications in the treatment of Varicose Veins. The lecture was very interesting and the interaction with delegates was memorable. This was followed by 7 oral presentations. In the afternoon there was a feedback session and the valedictory function.

Dr. H. B. Kekre, Dr. S.D. Bhagwat, Dr. M.S. Panse, Dr. Shubha Pandit and Prof. Ruchira Jadhav chaired various sessions.

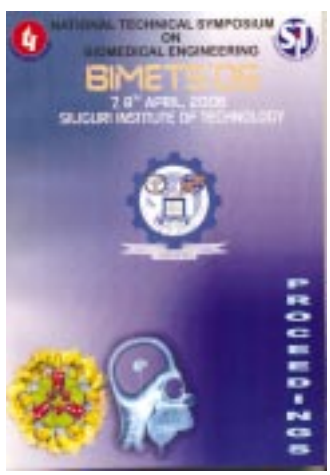
76 participants registered for the conference out of which 24 were from various corners of India.Out of 74 papers received 62 were selected by the expert committee, 22 for poster presentation and the 40 for oral presentation. For more information visit www.spec.ac.in or write to

<ncbme2006@spec.ac.in> Dr. Mrs. Nandini Jog

Principal, Sardar Patel Institute of Technology.
Munshi Nagar, Andheri (W), Mumbai 400 058

BIMETS' 06

A two day National Technical Symposium on Biomedical Engineering (BIMETS' 06) was successfully organized by the Dept. of Biomedical Engineering of Siliguri Institute of Technology (SIT) on 7th and 8th April, 2006.The symposium was inaugurated by Dr. Puvvada Ramesh, Dean Academics, Vignan's Engineering College, A.P.



The aim of the event was to bring together the students and BME professionals for gainful interaction.The event focused on plenary lectures by invited speakers, technical paper presentations, poster exhibition, model display and on current research methodologies and future methods in the frontier area of technology. The eminent invited speakers from academia and industry include Dr. P. Ramesh, Prof. Subrata Pal, Founder Director, School of Bioscience and Engineering, Jadavpur University; Dr. Gopalkrishna Prabhu, Associate Director (R&D), Dept. of BME, MIT, Manipal; Dr. Indrajit Sarkar , BPL India Ltd. All the lectures were well conceived and would be remembered by the students and delegates. The symposium concluded with colourful cultural programme rendered by the BME students of SIT.

All the events were well received and appreciated by invited speakers, delegates and student participants from various parts of the country. Please communicate with

Prof. Ankur Ganguly
Head Dept. of BME, Siliguri Inst. of Tech.,
P.O. Sukna, Siliguri 734 009.

National Symposium on Instrumentation
(NSI-31), 12-15 October, 2006

Instrument Society of India in association with Institute of Technology and Management, Gwalior is organising this national event. Focal theme of the symposium is **Recent Trends in Bio-medical Instrumentation.** It will cover different areas of bio-medical instrumentation focusing on the recent developments. Dr. APJ Abdul Kalam, President of India, will inaugurate and deliver 'Prof. Satish Dhawan Memorial Lecture' on 12th Oct., 2006.

Papers are specially invited in :

• Optical and Medical Instrumentation • Medical Imaging • Sensors, Trnasducers and MEMS • Bioinformatics and Medicine • Medical Experts System • Hospital Automation • Telemedicine • Robotics • Nuclear Instrumentation • Analytical Instrumentation, and related areas.

Last date for submission of abstracts 31July, 2006, acceptance of paper will be communicated by 31st Aug., 2006.

For further details visit **www.isoi.in; www.itmgoc.org/nsi31.**

Contact persons Prof. Ms. Tripty Varma Convener NSI-31, Dept. of Electronics and Instrumentation, Institute of Technology and Management, ITM Universe, Opp. Sithouli Railway Station, NH-75, Jhansi Road, Gwalior 474 001. <instru_itm@yahoo.co.in>

Prof. G. Mohan Rao, Gen. Secretary ISOI, Dept. of Instrumentation, Indian Institute of Science, Bangalore 560 012 <isoi@isu.iisc.ernet.in>

Your valuable suggestions for the newsletter are most welcome. Activity reports, articles, product reviews related to the field of BME are invited from the members for inclusion in the newsletter.

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