



## EDITORIAL:



Welcome to march issue of the “Engmednews” newsletter. It’s a great honor for me to add my first column in this newsletter as an editor. It’s the aim of the newsletter to keep you updated of any current activities in biomed field and help professionals, academics, researchers, policy makers working in the field of medical technology.

In this issue, we have an article YOG-EX (yoga and expert systems), an innovative tool for managing Indian traditional medical knowledge and also the health care technology for next generation, which I think will disseminate the Indian traditional system for health care.

We are always looking for people to get involved particularly in writing an article for the newsletter. If you would like to get involved or have ideas for development of the newsletter then do please get in touch with me.

I hope you find this issue of newsletter useful and informative.

## RECENT PAST EVENTS

### International Conference on Biomedical Engineering (ICBME 2011), Dec. 10-12, 2011



Biomedical Engineering is a field in which the principles of engineering are applied to assist problem-solving in medicine, and gaining more knowledge in life-sciences, towards enhancement in healthcare. Over the past few decades, R & D in this fascinating, multi-disciplinary field have evolved significantly. The Department of Biomedical Engineering at the MIT, Manipal University, Manipal, is in an excellent position to engage in research and teaching, with support of the reputed Kasturba Medical College. Accordingly, the Department organized the International Conference on Biomedical Engineering (ICBME 2011) during Dec. 10-12, 2011. The conference was chaired by Dr. Ramesh R. Galigekere, Professor & Head,

### CONTENTS

Pg.1-2-Recent past events

Pg.3-“YOG-EX”

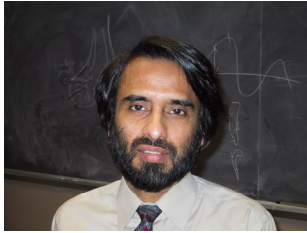
Pg.4-The Next Generation  
Of Healthcare  
Technologies

Pg.5-Forthcoming Events  
-Biomedical Catalog-  
New & Forthcoming

Department of Biomedical Engineering, MIT, Manipal, and also Dr. AG Ramakrishnan, Professor, Dept. of Electrical Engineering, IISc, Bangalore, and Dr. Jayaram K Udupa, Chief, MIPG, Dept. of Radiology, University of Penn. USA. The conference was preceded by two 2-day pre-conference tutorials: I. *Insights into Signal Processing, Transforms and Linear Algebra*, by Dr. AG Ramakrishnan, and II. *Medical Image Segmentation: Principles, Methods & Practice*, by Dr. Jayaram K Udupa, held

in parallel during Dec. 8 & 9, 2011.

The conference was inaugurated on Dec. 10, 2011 with Dr. Jayaram Udupa as the Chief Guest, Dr. Udayashankar representing Manipal University and Dr. Kumkum Garg, Director, MIT, presiding over the function. Dr. AG Ramakrishnan introduced the audience to the Biomedical Engineering Society of India.



**Dr. Jayaram K. Udupa.**

Call for Papers sought submission of *full-papers*, which attracted nearly 200 submissions; 62 were selected for presentation in Lecture-sessions, and 48 in Poster-sessions. The selection was based on the peer-review process involving a total of 117 reviewers (three per paper) from all over the world. The conference involved 10 lectures sessions, 3 poster sessions and 10 plenary lectures. The Plenary lectures included resource-persons from top R & D organizations from within India and abroad. The abstracts of all the sessions (Lecture, Poster and Plenary) have been published in the Souvenir.

The conference-proceedings, "*Biomedical Engineering*", with Ramesh R. Galigekere, AG Ramakrishnan and Jayaram K Udupa as Editors, has been published by Narosa Publishing House, New Delhi.



**Dr. AG Ramakrishnan**

The volume reflects advances in biomedical engineering research today, with contributions coming from many regions of the world. It covers a wide range of topics – from tremor assessment in Parkinson's disease to rural health monitoring; from micro pump for drug delivery system to protein microarray fabrication; from photo acoustic spectroscopy for prostate cancer detection to electrical impedance tomography; from simulator for laparoscopic surgical training to 3D ultrasound for guiding cardiac interventions; from automated blood vessel segmentation in retinal images to image registration using graph-cuts; from strength analysis of knee prosthesis to biomaterials for abdominal wall reconstruction; from modeling of flow behavior in cerebral aneurysms to finite element analysis of stress distribution in implants, and from synthesis of hydroxyapatite nanocrystals to probing stress on stem cells using Raman tweezers - promising a knowledge treat for the readers. Contributors to the papers and Posters in ICBME 2011 arose from 54 authors from organizations/institutes outside India.

Apart from the well-known objectives of an international conference, ICBME 2011 also aimed at serving the cause of

Research & Development, and Education in Biomedical Engineering, and strengthening the Biomedical Engineering Society of India.

ICBME 2011 was sponsored by various government organizations such as the Council for Scientific and Industrial Research (CSIR), Biomedical Engineering Society of India (BMESI), and the Indian Council for Medical Research (ICMR), apart from various private organizations. We take this opportunity to thank to thank all of them for their generous support.



**Dr. Ramesh R. Galigekere**

**Ramesh R. Galigekere, Ph.D.**

**Chair, ICBME 2011**

(with Dr. AG Ramakrishnan, Dept. of Elec. Engg., IISc, Bangalore, India & Dr. Jayaram K. Udupa, Chief, Medical Image Processing Group, U Penn, USA)

**Professor and Head**

**The Department of Biomedical Engineering  
Manipal Institute of Technology, Manipal University  
MANIPAL - 576 104,  
Karnataka, INDIA.**

**Phone: +91-820-2924211,  
29 24214;**

**Email: [ramesh.galigekere@manipal.edu](mailto:ramesh.galigekere@manipal.edu)**

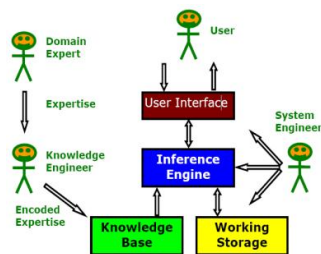
# “YOG-EX” AN INNOVATIVE TOOL FOR MANAGING INDIAN TRADITIONAL MEDICAL KNOWLEDGE

Uma D. Birje  
Dept-Biomedical Engg. (VIII sem)  
KLESCET, Belgaum  
[uma.yoga.birje@gmail.com](mailto:uma.yoga.birje@gmail.com)



“YOG-EX”.... didn’t get any idea right? It is the combination of yoga and expert system. It might sound different why we need to combine yoga and expert system. But it has become the necessity in the hospitals and clinics where the doctor routinely directs to perform yoga for certain kind of diseases. But the physicians are unable to provide expert guidance to the patients regarding it. Getting an expert to the hospital might be possible but it may not be feasible in rural health centers as people are more focused toward urban life. Since specialists or experts in many areas are less and the cost of consulting them is high; an expert system of those areas can be useful and cost effective alternative in long run. By combining yoga and expert system it is thus possible to provide expert guidance of yoga and its all aspects irrespective of the distance.

## How the YOG-EX is designed?



First, the expert system must be fed with its “knowledge” which is gathered by the yoga experts. Then the knowledge engineer encodes this information by using set of rules and conditions to store it in a Knowledge base. Next, information on a new problem is presented to the system through the user interface. A doctor trying to determine the name of the disease by inputting the patient’s symptoms, general condition, and

medical history, as well as results from simple lab tests.

In this system the physician need not tell the disease name to the expert system, he can enter the symptoms of the disease with which the patient is suffering. Expert system accepts these symptoms as query, analyzes it and identifies the particular disease name. The query is normally entered in the user interface and is stored in the working memory (It behaves like RAM). The information regarding the disease and yogic kriyas is stored in the knowledge base (It behaves like ROM).

The inference engine (it is like processor) fetches the information with respect to the query from the knowledge base and performs some programming operations to get back the result for the particular query and the result is displayed on the user interface, the result contains ASANAS AND PRANAYAMA for that disease. It not only suggests the name of the ASANAS but also gives the steps to perform those ASANAS and difference between correct and wrong postures. It also advices depending on the age of the person, condition of the patient, the stage of that disease etc...

Everyone desires good health and it is the ultimate objective for utmost happiness in the life. Good habits are the essential factors for maintaining good health and each and everyone has to follow good health practices in their routine life. But practicing yoga requires necessary information and guidance. With the help of **YOG-EX** we can achieve it, where the yoga can be taught to the patient through the **EXPERT SYSTEM**. This system is designed to meet the knowledge gaps of the individual physician with the specific patient problems. In the present era of information technology, it can be a boon to the rural health centers because even general medical practitioners can operate the system. The YOG-EX also has the capacity of suggesting the ASANAS for the sportsman/athletes, executives and working professionals, Musicians and artists, pregnant woman, craftsmen and so on. Thus YOG-EX is an innovative and powerful tool (expert system) which provides early detection of diseases and permanent solution to it, which leads the happy life, as yoga plays the prominent role in shaping one’s life.

## THE NEXT GENERATION OF HEALTHCARE TECHNOLOGIES

The healthcare technology management field is rapidly evolving, driven mainly by the integration of clinical engineering ICE and information technology (IT), including the advent of medical records (EMR), and also by increased health services. People who can master the technical and the professional skills required for the career- and continue learning and adapting- have tremendous opportunities for success.

The U.S Food And Drug Administration lists biomedical engineers as “mission- critical positions “in its multiyear hiring initiative to replace retiring workers and strengthen its public health mission. The earning potential of qualified biomedical professionals is robust as well according to BLS (U.S Bureau Of Labour Statistics). The median salary of BMETS (Biomedical Equipments Technicians), the latest year for which the figures are available, was roughly \$45,000 a year; senior technicians earned more than \$70,000 a year.

### **Minimum Requirements**

The Core Curriculum Committee has perhaps the best handle on the current and future requirements of the next generation of BMETS. The Core Curriculum Committee is reviewing the job descriptions and tasks expected of entry level BMETS. These include IT Skills, Communication, Collaboration and Interpersonal Skills.

Specifically the Core Curriculum Committee members cite the specialized skill sets that include Risk Management. Capital management, Project Management, Environment of care management, Systems and Strategic Thinking.

### **More Opportunities For Women!!**

Biomedical Engineering is the second most popular engineering major for women, according to the latest data from the American Society of Engineering Education. This could be more because more women are employed in the healthcare profession in general, as clinicians and other healthcare professionals are dedicated to improving people’s lives.

### **Advancing Your Career**

As medical technology becomes more specialized and complex, there will be increasing demands for skills related to specific equipment. That’s the case at Conquest Imaging, an ultrasound equipment supplier and service provider based on Stockton. Conquest Imaging says that it values skills in job applicants such as ability to work independently, Critical thinking skills, Strong customer service to both internal and external customers, flexibility and adaptability, reliability, practical knowledge and experience and so on.

### **Be Willing To Relocate**

Working in smaller organizations can offer more exposure to different types of equipment, since there may be less staff specialization, and more responsibilities and opportunities to learn.

And thus most of the institutions ask their students to be willing to relocate if they want to guarantee themselves with a job.

***Compiled by: Avinash Konkani, Doctoral Student in Systems Engineering, Oakland University, Michigan.***

**BIOMEDICAL CATALOG-NEW  
& FORTHCOMING (NAROSA  
PUBLICATIONS)**

**Bioethics**

**Author(s):** S. Ignacimuthu,  
S.J.

**ISBN:** 978-81-7319-966-0

**No. of pages:** 208

**publishing Year:** 2009

**binding:** Paper Back

**Biomedical Engineering**

**Editor(s):** R. R. Galigekere,  
A. G. Ramakrishnan, J. K.  
Udupa

**ISBN:** 978-81-8487-195-1

**No. of pages:** 354

**Publishing Year:** 2012

**Binding:** Hard Back

**Nano Materials**

**Author(s):** B. Viswanathan

**ISBN:** 978-81-7319-936-3

**No. of pages:** 250

**Publishing Year:** Reprint  
2011

**Binding:** Paper Back

**Bioinformatics**

**Author(s):** Darbeshwar Roy

**ISBN:** 978-81-7319-988-2

**No. of pages:** 252

**publishing Year:** 2009

**binding:** Paper Back

**FORTHCOMING EVENTS - 2012**

**BIO-QUENCH NATIONAL LEVEL  
TECH FEST-2012**

Date: 20 and 21st April 2012

Place: KLE'S COLLEGE OF ENGG & TECH  
BELGAUM, KARNATAKA, INDIA

Further details

<http://www.besta.org.in>

**BEATS-2012**

2<sup>ND</sup> International conference on

BME Assistive Technologies

Date: 6 and 7<sup>th</sup> Dec 2012

Place: NIT Jalandhar, Punjab.

Further details

<http://www.beats2012.org>

**Medifest- A Vantage Trade Fair**

Date: 12 and 13<sup>th</sup> October 2012

Place : New Delhi

Further details

<http://vantagemedifest.com>

**AICTE Workshop**

Faculty development program  
on Graphical Programming.

Date: 14 to 25<sup>th</sup> May 2012

Place: Department of  
Instrumentation

College of Engg, PUNE

Further details

<http://www.coep.org.in>

Send your articles to

SADANAND B KULKARNI,  
Editor ENGMEDNEWS,  
Dept. of Biomedical Engineering,  
KLE'S College of Engg. & Tech.  
Belgaum-590008

[sadanand.kulkarni@gmail.com](mailto:sadanand.kulkarni@gmail.com)

Members are requested to update  
their contact details with email Ids in  
the format given below to the editor  
([sadanand.kulkarni@gmail.com](mailto:sadanand.kulkarni@gmail.com))  
to enable us to send you the e-version  
of engmednews and

**GO GREEN!!!**

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Institute/Organization: \_\_\_\_\_

BMESI Membership: \_\_\_\_\_

Email ID: \_\_\_\_\_

Mobile No.: \_\_\_\_\_

Contact Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Visit us at:

<http://www.bmesi.org.in/engmed.html>

\_\_\_\_\_

Editorial Support team: Raviraj Havaladar (faculty), Firdous Mulla (faculty), Neelima, Abhinav, Spurti, Kanchan, Prajna and Ashwath (Students) KLE'S CET Belgaum

Ideas expressed here are of the individuals and not of BMESI. Published by Biomedical Engineering Society of India, Department of Biomedical Engineering, Manipal Institute of Technology, Manipal-576 104. Edited by Prof. Sadanand B. Kulkarni, Professor & Head, Dept. of BME, KLESCET, BELGAUM. <[sadanand.kulkarni@gmail.com](mailto:sadanand.kulkarni@gmail.com)>