



# IFMBE News

International Federation of Medical and Biological Engineering  
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*Beginning of New Period*



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### IFMBE News

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## Editorial

### Growing In Love

At the first issue of IFMBE News in 2013, I would like to extend my warm greetings to you, to wish you a healthy and happy new year.

All the way, IFMBE News is growing in love. I sincerely appreciate for your support and publicity to IFMBE News.

This year, IFMBE News stepped into its new term of 2013-2015. Some active members joined, and a new plan will be taken.

This year, Ms. Xiaohong Weng from China who had made special contribution to the WC2012, will join us as the new editor assistant of IFMBE News.

With the new plan, we expect to bring you more advance publicity for important BME activities, give you special comments on BME trends, show you different perspectives of BME around the world, and let you know what IFMBE is doing.

If you have any BME news or requests in your countries or regions, in your fields, even in your offices, IFMBE News would like to be your best platform to reach BME colleagues all over the world.

I would like to invite you to share your ideas with us, and follow our publicity with interest. Let's together inject energy and vigor to IFMBE News. We will continuously work on the News, and keep in touch with you. If you have anything, please don't hesitate to contact us at [ifmbe\\_news@yahoo.com](mailto:ifmbe_news@yahoo.com).



NEWS EDITOR  
Kang Ping, LIN



## IFMBE-WHO

### Status Activities and Report

#### IFMBE's activities as an NGO in official relations with the World Health Organization

Marc Nyssen  
IFMBE's "Focal Point for WHO"

Last week, IFMBE was informed that our status as 《NGO in official relations with the World Health Organization》 is confirmed and continued, as a result of a serious review and evaluation.

Quite a success, regarding the current context.

Since many years, we have a close collaboration with the World Health Organization, mostly regarding "medical devices", but also in the fields of "public health", "disaster readiness", "e-Health" and "human resources for health".

The Federation participates in the meetings of the WHO's "Executive Board", consisting of the representatives of 34 of the WHO's Member States' representatives and recognized NGO's and in the yearly "World Health Assemblies" consisting of all the Member States and NGO's, and specific meetings regarding our field of expertise, such as round tables on research and global fora on medical

devices. Moreover our experts coauthor publications, guidelines and recommendations, in WHO book series.

Following the world's most recent economic crises and the criticism, resulting after the over-prudent recommendations issued by WHO to combat the HN1N flue virus outbreak in 2010, resulting in billions (over)spent on vaccines, a reform was initiated, to start with a new action plan 2013-2017:

currently called the "Draft twelfth general programme of work".



WHO's 132nd Executive Board in Geneva, January 21st-28th 2013



WHO is an organization formed by the "Member States" and its budget comes from the contributions of the Member States' governments (roughly 1/3) and from gifts (also from Member States, from private funding organizations such as Rotary Club and others) and agreements with other international bodies such as the United Nations and the World Bank (roughly 2/3). This uncertain funding puts the organization in a delicate position: every year, the operational budget depends on income that cannot be fully relied upon.

The objectives of the current reform are:

- Improve health outcomes, with WHO meeting the expectations of its Member States and partners in addressing agreed global health priorities, focused on the actions and areas where the Organization has a unique function or comparative advantage, and financed in a way that facilitates this focus.
- Greater coherence in global health, with WHO playing a leading role in enabling the many different actors to play an active and effective role in contributing to the health of all peoples.
- An Organization that pursues excellence; one that is effective, efficient, responsive, objective,

transparent and accountable.

The main action lines of these reform are in a nutshell:

1. Programmatic reform:  
redefining health priorities, based on Member States consensus, such as
  - continued eradication of infectious diseases (polio)
  - more emphasis on "non communicable diseases" such as diabetes, cancer.
  - Define outcome indicators
2. Governance reform
  - oversight
  - scheduling and alignment
  - harmonization
  - strategic decision making
3. Managerial reform
  - support to member states
  - human resources
  - finance
  - accountability and transparency
  - evaluation
  - communication
4. Change management
  - coordination, monitoring and evaluation of the reform

The reform results in:

- stronger and fully transparent financial control and explicit



- indication of budget impact on each resolution taken (impact of the Programme, Budget and Administration Committee (PBAC) to follow up on this); cost-effectiveness of each action
- more de-centralized operation via the "regional offices"
  - more scrutiny regarding "external organizations" to avoid mixing "personal" interests with WHO's programs and actions
  - the need for reliable parameters and indicators.

During the past Executive Board meetings and World Health Assemblies, IFMBE successfully advocated the importance of "appropriate technologies" and of the engineering task force in the health system, as is reflected in the proposed work plan 2013-2017, which includes several paragraphs from our interventions during the meetings.

For Biomedical and Clinical Engineers, our collaboration with WHO offers many opportunities:

- a very rich set of documents, to which many of our members contributed, regarding health statistics, recommendations for "public calls", standards, nomenclatures, a consistent body of texts in the field of "medical devices and device management"

- the same for "public health" and "e-Health"
- international collaborations, project-wise or on exchange of information
- putting our professions on the list of recognized "health workers".

You will find a tremendous wealth of information via WHO's web site: <http://www.who.org> and in particular, regarding medical devices: [http://www.who.int/medical\\_devices/en/](http://www.who.int/medical_devices/en/)



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## The Increasing Role of Human Factors in Clinical Engineering

### The Challenge:

Clinical Engineering by its nature is a cross-disciplinary subject, and clinical engineers are always working with colleagues in other disciplines to try to ensure that health technologies are deployed safely and effectively.

The discipline of Human Factors has been part of Industrial Engineering and Psychology for many years, and has been applied to great effect in various industries, to improve safety and efficacy and to reduce risks associated with poor technology and system design, recognizing our intrinsic strengths and weaknesses as human operators in a system. Great improvements in safety have been made by applying human factors methods to industries such as aviation. There is a growing awareness of the impact that human factors methods can have on health care, and clinical engineers are ideally positioned within health care to help lead this change.

The U.S. Food and Drug Administration defines human factors engineering as "The study of how people use technology. It involves the interaction of human abilities, expectations and limitations, with work environments and system design"<sup>1</sup>. As clinical engineers, we often hear from clinical users that a piece of equipment did not perform the way they expected. We

then test the equipment and find that it is working according to its specification. If we take the time to go and observe how the equipment is being used, we may discover that there is a mismatch between the design of the equipment and the knowledge of the users, or that the equipment is not well suited to the clinical environment it is being used in. Human factors methods allow us to identify some of the root causes of these problems, and what can be done about them.

Why is this important to us in health care? In 2000, the Institute of Medicine in the United States released its landmark report, *To Err is Human*<sup>2</sup>. Using an analysis of the charts of patients treated in health care institutions, they estimated that between 44,000 and 98,000 deaths were occurring annually due to medical error. The Canadian Adverse Events Study, published in 2004<sup>3</sup>, estimated that between 9,000 and 23,000 deaths were occurring annually in Canadian hospitals due to preventable adverse events. Canada's population is

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1. [Http://www.fda.gov/cdrh/humanfactors/whatis.html](http://www.fda.gov/cdrh/humanfactors/whatis.html)

2. *To Err is Human: Building a Safer Health System*. Ed., Kohn L, Corrigan J and Donaldson M. Institute of Medicine, National Academy Press, Washington, D.C., 2000. ISBN-10: 0-309-26174-0

3. The Canadian Adverse Events Study. Baker GR, Norton P et al., *CMAJ* May 25 2004 vol. 170 no. 11 doi: 10/1503/cmaj.1040498



approximately one-tenth that of the United States, so on a per capita basis, the Canadian numbers are higher. Studies in other countries have yielded similarly high numbers. This huge problem is largely hidden since these deaths happen one by one, unlike a plane crash or an accident at a nuclear power plant, and generally don't attract public attention.

The patient safety movement has been pushing hard for the adoption of human factors approaches into various aspects of patient diagnosis and treatment, and human factors methods lend themselves readily to the work of clinical engineers in health care environments.

## What Can Clinical Engineers Do?

As clinical engineers, we concern ourselves with the design, selection, introduction and ongoing support of a wide range of medical device technologies used in health care. There are a variety of ways in which we can apply human factors knowledge to our practice, to help to improve the safety and usability of these technologies.

For clinical engineers who are interested in starting to incorporate human factors methods into their practice, a good place to start is to find out whether there are any human factors professionals working nearby. They may well be interested in collaborating and lending their

expertise to challenges in health care. There are also books and articles that explain the various methods used in human factors work, and how they can be applied.

Several key methods are proving very useful and applicable in clinical engineering work. First, let's consider ethnographic analysis and workflow analysis. Simply put, this involves spending time in the clinical environment, observing the issues that a range of technology users experience interacting with technologies. This can be very revealing, and can point to design problems or knowledge issues on the part of the users. Workflow analysis considers the overall workflow associated with a sequence of care, and takes into account situations where clinical staff may be busy with many duties and so not necessarily able to spend much time on the technology issues that they face.

Heuristic analysis involves applying a series of structured questions about the behavior of a technology while conducting a review of its operation. Usually conducted by trained human factors experts, the sequence of operations of a technology are moved through and at each stage, a series of heuristic questions are asked, to identify issues such as a mismatch between the operation of the technology under review compared with the norm for other technologies.



The detection of these violations helps to identify points at which users may experience problems during device operation. Often the only short-term mitigating strategy is to train clinical users on approaches that help to overcome these problems. Clinical engineers can be trained to develop the skills necessary to conduct these analyses.

Usability testing is a controlled study of the way in which the intended users of a device interact with it to perform typical tasks. This experiment may be filmed for later analysis, and users are encouraged to "think out loud", speaking about any problems they encounter during the experiment. This helps to uncover areas of use where intended users have difficulties, and also produces quantifiable measurements such as how much time is required to perform a particular task.



A member of the HumanEra Team participates in Usability Testing

These methods can be applied to existing health technologies, to aid in identifying problems at the new

product selection stage or with products that are already in use.

These assessment methods can also be used during the design development of new health technologies, which helps to ensure that as a product evolves, it is well suited to the environment of use and to the needs and knowledge of the intended user group.

Clinical engineers are increasingly working with human factors professionals and learning more about human factors methods themselves, since the benefits of these methods of analysis and this approach very quickly become apparent. Pockets of expertise are developing in the application of human factors to health technology. Look to more and more training on human factors methods being included in clinical engineering training programs as a result.

Work at the Centre for Global eHealth Innovation at University Health Network in Toronto, Canada, is helping to demonstrate the important role that human factors methods can play in making health technologies safer and more usable.

Tony Easty, PhD, PEng, CCE, is a Senior Scientist, University Health Network, Associate Professor, Institute of Biomaterials and Biomedical Engineering, Baxter Chair in Health Technology and Team Lead, HumanEra.



## Women in Medical and Biological Engineering Committee News

The committee plans to hold a symposium with the theme "Gender aspects of medical devices" at the next World Conference. We welcome presentations on the impact of devices and biomedical technologies on women, and also on the impact of women (design and development) on biomedical technologies. (Moniq The idea in China was to have a symposium with the theme "Gender aspects of medical devices" and that we should welcome presentations on the impact of devices and biomedical technologies on women, and also on the impact of women (design and development) on biomedical technologies.

A mentoring program:

One of the main recommendations coming out of the women in biomedical engineering workshop at WC2012 was to develop an international mentorship program for women in BME, to be supported by the IFMBE's website. The WiMBE committee has prepared a proposal for the mentorship program that includes setting up the platform for the program, advertising it and providing training and support to mentors as well as mentees. We are keen to use existing platforms and online resources wherever possible and to build learning and evaluation into the mentorship program itself so that it will be responsive to mentees' needs and provide learning materials, such as case

studies, that can be shared with wider audiences. This project is led by Shauna Mullally (Canada).

### **A profile of Anna Kah, a young woman from the Gambia studying biomedical engineering on scholarship in Canada**

Anna was selected from over fifty Gambian high school applicants for a competitive scholarship to study biomedical engineering abroad. The Gambia doesn't have a university level engineering program yet.

Anna's scholarship is from the Rogers Tropical Medicine Research Fund and is administered through the United Kingdom's Medical Research Council (MRC) site in the Gambia, West Africa. The MRC has operated in the Gambia for over 60 years, performing research into tropical diseases and providing clinical services in conjunction with the Ministry of Health.

Anna is in her second year of studies at Carleton University in Ottawa, Canada and has settled into her studies and life in Ottawa incredibly well. She recently made the Dean's List for academic excellence.

Shauna Mullally interviewed Anna about her experiences as a young woman studying biomedical engineering as an international student, and what she would like to do upon her return to Africa.



Figure 1 Anna

## Why were you interested in science and engineering growing up?

I was interested in science growing up because of my dad; he has spent his entire life teaching science and we always had science books and toys around our house. He piqued my interest in math and biology specifically and always helped with my homework.

In physics class in high school in the Gambia I built a solar oven using recycled material like aluminum foil, shoeboxes and mirrors. We used a thermometer to check the temperature and it worked. Our oven is still on display at my high school and it's used for public events to showcase science and engineering projects.

I found myself studying engineering (instead of science) mainly because of the scholarship that I won. It turns out I absolutely love it and am so happy I ended up in an engineering program!

## What is your experience like at Carleton being an international student?

It's challenging. The transition between high school and university is tough enough for students and it's even harder for those of us coming from other countries and cultures. I've had to learn quickly and adapt to a new environment... not to mention the shock of Ottawa's winter weather!

That being said, I've really enjoyed it. Carleton University where I study has a big international community and I've met people from all over the world. I've even met other Gambian students and found out where to find Gambian food in Ottawa!!.

There is no university level engineering programme at home in the Gambia and I'm happy I'm here; I wanted to study somewhere like this.

## What are your labs and courses like? Which ones do you like the most, and why?

The course work is intense - but I like it! I really enjoy my biology course because I've always been interested in it, and my programming and systems courses. I had no idea I would like programming as much as I do!

I particularly like my lab courses because I get to learn by doing... building my own circuits to figure out what works and what doesn't work.



And my programming labs... the hours of debugging are worth it when my programs work. That's the best way to learn.

**You spent last summer working in the biomedical engineering department at the UK's Medical Research Council in the Gambia. What was that like?**

The biomedical engineering team at the MRC is responsible for managing and maintaining equipment across the MRC's research laboratories, clinical laboratory and clinic. They are a great team of technologists and they also take in students from the local technical training school for workplace attachments.

Working there last summer after my first year of engineering at Carleton was a great experience. I got to learn more about basic electronics and how to troubleshoot equipment.

All of the clinical equipment was due for preventive maintenance during my summer work term. I got to travel across the country helping with the preventive maintenance jobs at the MRC sites, from Keneba to Basse, which is on the Eastern border of the country! I also helped with the inventory, checking the equipment and updating the database.

I also went to the district hospital in Bansang and to some of the health centres to check on equipment with

some of the biomedical engineering team. This gave me a good idea of how much is actually needed in terms of maintenance in the hospitals and health centres. Some of the equipment had been damaged in a flood during the rainy season and we had to bring some of them back to our workshop to troubleshoot.

**What would you like to do for your next work placement this coming summer?**

I would love to work in a hospital environment next, having learned a lot about research and laboratory equipment with the MRC. Hospital environments are very dynamic and I like the thought of being on call and responding to service requests when needed.

I'd like to work with doctors and nurses and be part of a team that I can contribute to by advising on what is needed in response to a unique situation, to troubleshoot.

I'd like to work anywhere that has engineers that I can learn from and apply the knowledge that I've learned so far. I wouldn't mind working in an industrial setting either, and research would also be great. Basically, I want to work anywhere that I can continue to learn!



## What do you want to do after your undergraduate degree?

I want to work. I'd like to take a break from studying and learn by working with other people who are in the field. I'd like to work for a few years and then see if I want to do more studies.

Right after graduating I'd like to go home. I'd like to work somewhere close to the Gambia in Africa, like in Senegal or Mali. Some of the senior members of the MRC's biomedical engineering team travel to other countries in West Africa for work, and I'd like to do that too.

## Who has been an influence on you, and why?

My parents have been my greatest influences. They taught me my valuable work ethics and to love science. Family is really important to me. I've also met a lot of people here at Carleton who are really inspiring. My programming professor is awesome. I like the way she teaches and makes programming so exciting she's unconventional and does her own thing and it works!

## What has your experience been as a female student in biomedical engineering?

I think it's awesome! We have a lot of female biomedical engineering

students; in fact, we make up about half of my program (biomedical and electrical engineering). I have a good group of friends with whom I go to class, do the same labs and hang out with also. We learn a lot from each other and we perform better because of each other's support.

Last fall we went to an IEEE Women In Science and Engineering (WISE) event to speak with high school students about biomedical engineering. We brought displays and photos of some of our projects and the high school students had lots of questions. It was really fun!



Figure 2 Anna and friends at IEEE WISE event



## How do you think biomedical engineers contribute to society, both generally and in the Gambia and Africa in particular?

We need more biomedical engineers working in the health systems around the world, particularly with ageing populations and so many new and different technologies that change all the time. The health sector is also moving towards more computing and wireless devices and self-care technologies. Engineers are needed to design, manufacture, integrate and maintain these devices.

Biomedical engineers are also needed desperately (Love it!) back home. We have lots of hospitals in Africa without enough technologists or engineers. This situation has to change. We need more engineers working with decision makers also, not only in hospitals but also in Ministries of Health, to provide advice on health technology management.

As biomedical engineers, we know about health technology management, life cycle costing and energy savings to most effectively use resources. We are particularly necessary in countries with so little resources! We can provide advice on how to save money by making good decisions about equipment. This is so vital!

## What's your dream job?

I want a job that I can work hard at and provide what's needed. I want to work close to home, in Africa. If I can get a biomedical engineering job that serves Africa, where I can make a difference that would be great! I want to be productive and to give back to a society that has given me so much.



## ACEW Peru Report

### Advanced Clinical Engineering Workshop

Lima, Peru  
November 12-16, 2012

ACCE Volunteer Faculty:

*Mario Castanda, HealthiTek Thomas Judd, Kaiser Permanente  
Ismael Cordero, Clinical Engineering Consultant Tobey  
Clark, University of Vermont, Faculty Leader*

#### Introduction

Health Technopole CENGETS at Pontificia Universidad Católica del Peru (PUCP) provided a proposal for the ACEW in late 2011 and an agreement between ACCE and PUCP was signed in July 2012.

The Advanced Clinical Engineering Workshop took place in the El Condado Hotel and Conference center in Lima, Peru over the period November 12-16, 2012. To accommodate the participants work schedule, the workshop was held between 2-6pm Monday-Friday.

The primary sponsor of the workshop was Pontificia Universidad Católica del Peru. Additional sponsorship was provided to CENGETS by the International Federation of Medical and Biological Engineering (IFMBE), Set-Gat

from Colombia, and other minor sponsors. Supporting organizations included the Ministry of Health, PAHO, DIGEMID (regulatory), INMP-Maternity Hospital of Lima, APBIO, CENETEC, CORAL, EMB Peru and University of Vermont.

Fourteen conference calls were held between the ACCE faculty members with an additional six meetings with CENGETS and ACCE faculty. The estimated total volunteer time of the faculty was over 500 hours. The final ACEW plan was version 17.

The workshop theme was Leadership and Innovation. Each day focused on a specific aspect of healthcare technology.

1. Public Policy for Health Technology Planning and Management
2. Role of public and private



organizations in Healthcare  
Technology Planning

3. Healthcare Technology Management-  
HTM for a modern health system
4. Better Access to Health through  
Telemedicine and eHealth
5. Case Studies from Peru and  
Mexico/Participant Case Study  
Presentations

The workshop topics were derived from the focus areas above and invited speaker topics. The ACCE faculty received sample presentations from each other and the ACEW presentation library. The presentations and supporting materials were uploaded to DropBox for exchange and review. These presentations were then downloaded to the workshop CENGETS PUCP website for use by the participants.

To engage the participants and produce deliverables, each day included two 30 minute review and discussion sessions including:

- Key points from discussions
- Key questions
- Input from group answers to question
- Review list and identify top priorities

These sessions were modeled along the lines of the AAMI Summits.

Participant case studies were another important part of the workshop. Three participant groups were created to

develop presentations and/or role play activities in the areas of:

- Policy and Planning
- Safety
- Maintenance

The assignment was:

1. Define example clearly looking at significant areas of Technology Management
2. Collect the information e.g. factors, issues
3. Analyze the problem using techniques from the workshop
4. Develop solutions determine best course of action

The faculty and program sponsors would vote on the best presentation using the following criteria:

1. Clarity of presentation
2. Use of principles and processes from the workshop
3. Development of a working, successful solution to the problem
4. Creativity of approach

The ACEW presenters included ACCE faculty team and:

- Rossana Rivas, Health Technopole CENGETS
- Luis Vilcahuamán, Health Technopole CENGETS & Director, Master's Program in Biomedical Engineering PUCP



- Dr. Cesar Cabezas, Chief, National Institute of Health
- Dr. Pedro Mascaro, Director, Maternity Hospital of Lima (INMP)
- Dr. Amelia Villar Lopez, Director
- Herbert Voigt, Phd, Professor Boston Univ. & President, IUPESM/Past Pres. IFMBE
- Walter Rios, IEEE/EMBS Peru
- Eduardo Toledo, PUCP Engineering Faculty
- Alvaro Velasquez, Director - HMC Architects South America
- Dr. Walter Curioso, Director General Office of Statistics and Information, MoH Peru
- Roberto Ayala Perdomo, Director Biomedical Engineering, CENETEC, Mexico
- Dr. Pedro Yarasca, DIGEMID - MINSA
- Dr. Silva Perez, DIGEMID MINSA
- Patricia Ramirez, Health Technopole CENGETS (INMP)

## Workshop Overview

Luis Vilcahuaman and Rossana Rivas of Health Technopole CENGETS coordinated all aspects of the workshop. The venues, announcements, course materials, and arrangements were of very high quality. Simultaneous English to Spanish translation was provided for all participants and the quality was excellent.

The average daily attendance was 35 in Lima and an additional 20 in other regions of Peru, plus the countries of Paraguay, and Guatemala who attended via videoconference. The audience consisted of Ministry of Health, ESSALUD, and private hospital administrators, physicians, and engineers, PUCP faculty and biomedical engineering students, and additional participants from other parts of Peru and Latin America.



Participant case study work with Ismael



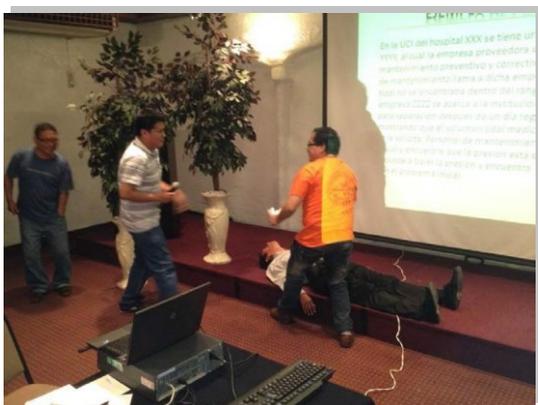
Rossana Rivas engages the audience with her presentation on Project Management



ACCE faculty, hospital directors, CENGETS staff and HerbVoigt at INMP



Policy and Planning group work on their presentation



Role play of patient demise related to respiratory device failure

## Summary

In terms of energy and engagement as evidenced by the number and merit of questions, the overall quality of the program was extremely successful. The faculty team from ACCE was outstanding due to their experience and unique expertise in areas of Healthcare Technology Management and/or Clinical Engineering. Their will to contribute wherever necessary was commendable.

On the final day, all review and discussion session priorities for action were reviewed. Based on a final prioritization, the workshop participants came to a consensus on the most important actions to take so Healthcare Technology Management and Clinical Engineering can leapfrog current practice to have high value in Peru:

### Law/policy

1. Raise the awareness of healthcare technology management (HTM)
  - a. Creating laws mandating every hospital requires a clinical engineering team
  - b. Reform the health laws so that maintenance and calibration is included in the health laws
2. Promote policies that elevate the awareness of HTM



## Proposals

1. Creation of vice health ministry level healthcare technology assessment (HTA) position
2. Streamline and organize national HTM processes
3. Combined proposal to MoH from multiple universities; socialize proposals with all relevant entities
4. Start fresh with new hospitals. Do it now!
5. Peru healthcare catch-up in informatics and digital health
6. Planning for equipment by multidisciplinary team

## Education

1. Educate the population re: health technology
2. Training and education in colleges and universities in biomedical and clinical engineering
3. Research and development in HTM and biomedical and clinical engineering.

The workshop evaluation is found in Appendix B. The content and effectiveness of presenting HTM received high marks along with the knowledge of the presenters, quality of the presentations, and meeting the objectives of the workshop. As has been the case with other workshops, the participants would have like more time for the workshop. Final materials were

made available after the evaluations on the last day of the workshop. It was very encouraging to see that 85% of the attendees will use the knowledge at their healthcare workplace.

## Lessons learned:

1. Leaving time for review and discussion after several talks produced good engagement of participants and priorities for action.
2. Following the format of the AAMI Summits to "boil down" the priorities and actions was a nice addition to plan future activities and sustainability.
3. First time involvement of the IFMBE both as a speaker/participant and financial sponsor should be pursued in future ACEWs. This was a positive action.
4. Providing ACCE handouts was valuable in introducing participants to ACCE. International, Certification, CE/IT and basic brochures were provided. (Also a large box of publications was provided by AAMI and the HTF).
5. Order ACEW pens early.

## Future

ACCE's presence was strengthened via the workshop. With the international membership and teleconference structure, additional Peruvian ACCE members are a strong potential. In



addition to the relationships developed with the participants resulting in continued communication, organizations attending the event are interested in discussing a number continuing projects involving ACCE or ACCE members acting as individuals or with their organizations are possible. This includes proposals to the National

Institute of Health-NIH, continuing the University of Vermont clinical engineering internship training and activities with PAHO Limasee appendix C. In Peru, ACCE should continue to support CENGETS, biomedical society growth, clinical engineering education and certification.



ACEW Faculty visit Neonatal ICU graduates party: "Feast of premature child" at Maternity Hospital of Lima



## Appendix:

### Additional scheduled visits and meeting with healthcare organizations

1. National Institute of Health (INS), an agency of the Peruvian Ministry of Health several meeting was held with INS personnel including the director, Dr. Cabezas. The focus of these meeting was on challenges INS faces related to technology. They fall into three categories:
  - a. Heavy metal pollution from mining
  - b. Maternal and child health
  - c. Development of a healthcare technology division

Several conference calls were held after the workshop to develop a proposal for INS involving PUCP and potential partners from University of Vermont, IUPESM, and consulting groups. ACCE is considered a partner also.

2. Pan American Health Organization (PAHO) Lima office was the location of a meeting with ACCE faculty, CENGETS and Herb Voigt. The focus here was on building capacity in healthcare technology through training and general support issues.

3. Maternity Hospital of Lima (INMP) is the national center for maternal and child health. The visit included CENGETS healthcare technology management office, the neonatal ICU, the biomed shop, and a celebration for neonatal ICU graduates where Mario Castaneda and Tobey Clark were interviewed by Univision TV for the Peruvian television network regarding CENGETS, the ACEW and HTM. The INMP directors agreed to pay for the travel costs of CENGETS staff to be trained at the University of Vermont.



ACEW Faculty with HTM team at Maternity Hospital of Lima



## Biomedical Engineering International Conference (BME2012)

“To Better Healthcare with Groundbreaking Technologies and Regulatory Affairs”  
successfully completed during 5-8 December 2012

The Biomedical Division of The Hong Kong Institution of Engineers (HKIE) and Hong Kong Productivity Council (HKPC) have jointly organized the BME2012 (Biomedical Engineering International Conference) on 5-8 December 2012 with an official opening held on 6 December 2012 at Hospital Authority Headquarters by Guest-of-Honor, Mr Anthony WU, Chairman of Hospital Authority, together with 6 officiating guests.

This biennial BME conference series was incepted in Hong Kong in 1992. BME2012 was organized with the funding support of the Professional Services Development Assistance Scheme (PSDAS) under the theme of "Improving Healthcare through Innovative Technology and Regulatory Affairs" The Conference highlighted the importance of health technology and regulations for biomedical engineers.

It has been our honor to have world-renowned experts from Singapore, Canada, UK, USA, the mainland and local prestigious speakers to share with us a wide spectrum of topics on biomedical engineering at BME2012. The Conference kicked off with a talk

on career path of biomedical engineer (presented by Prof. James Goh), followed by scientific presentations on Biomechanics, Biomaterials and Tissue Engineering, Medical Imaging, Nano/Bio Sensor on Day 1. Scholars and biomedical engineers continued to share under the themes of Neuroscience and Rehabilitation Engineering on Day 2, with highlight of the day being the presentation by the Founder of ECRI, Dr Joel NOBEL, in the session of Health Technology Assessment & Patient Safety. Discussions continued on Day 3 under the themes of Medical Device Regulatory Affairs & Risk Assessment, Government Funding for Medical Device R&D and Medical Device Design & Development, where the audiences were briefed with the latest advancement of biomedical technologies, medical device regulatory affairs and source of biomedical R&D funding resources. The event ended with a Technical Visit to The University of Hong Kong Shenzhen Hospital and the Shenzhen Testing Center of Medical Devices on 8 December 2012, which further enabled future collaborations in clinical trials and medical devices testing by leveraging the supports from Shenzhen.



Presentation on "The Career Path of Biomedical Engineers" By Prof James GOH, Head and Professor, Department of Bioengineering, National University of Singapore

The Conference has received more than 60 paper submissions. A Young Engineers' Paper Competition was also held during BME2012, with prizes being awarded to winners by the HKIE President. With more than 300 participants from local and overseas, BME2012 has served as a timely platform for information exchange and the exploration of new collaborations in the biomedical engineering arena. We would like to express our deepest gratitude to the speakers, sponsors, funding agent, key supporting organizations, supporting organizations, partners in Shenzhen, participants and the organizing committees of BME2012, who have enabled the Conference be concluded with great success.



Guest-of-Honor and Officiating Guests at the Ribbon Cutting Ceremony of BME2012 Opening

Starting from the left:

Dr CHEUNG Wai Lun, Director (Cluster Services) of Hospital Authority

Ir CHAN Fan, JP, Director of Electrical and Mechanical Services Department, The Government of HKSAR

Ir Prof CHOY Kin Kuen, President of The Hong Kong Institution of Engineers

Mr Anthony WU Ting-yuk, GBS, JP, Chairman of Hospital Authority

Mr Clement CHEN Cheng-jen, BBS, JP, Chairman of Hong Kong Productivity Council

Mr Albert LEE, Chairman of The Hong Kong Medical and Healthcare Device Industries Association

Ir Dr CHAN Kwok Kwan, Chairman of BME2012 Conference



BME2012 Opening held on 6 December 2012 at Hospital Authority Headquarters

For further enquiry, please contact the BME2012 Conference Secretariat (Bryan SO) at [bryanso@hkpc.org](mailto:bryanso@hkpc.org) or (852) 27885548.

<http://www.hkpc.org/bme2012>



August 5-8, 2013  
Beihang University, Beijing, China

[wacbe2013.buaa.edu.cn](http://wacbe2013.buaa.edu.cn)



### IMPORTANT DATES

Deadline for paper submission:

**March 31st, 2013**

Notification of paper acceptance:

**May 15th, 2013**

# The 6<sup>th</sup> WACBE World Congress on Bioengineering

**W**orld Congresses on Bioengineering held by the World Association for Chinese Biomedical Engineers (WACBE) is an international conference with high academic level and worldwide impact, providing a platform for Chinese scientists, engineers and students from all over the world to share their experiences and to exchange views on the future development of biomedical engineering. The 6th WACBE World Congress on Bioengineering will be held on August 5-8 2013 in Beijing, and it will continue to offer such a networking forum for bioengineers to keep abreast of the latest development of the field as following:

### SESSIONS

- Aviation and Space Medical Engineering
- Biomaterials, Tissues Engineering and Regenerative Medicine
- Biomechanics, Sports Medicine and Rehabilitation
- Biomedical Imaging, Signal Processing, and Health Informatics
- Biosensors, Bionanotechnology and Medical Devices
- Cellular, Genomic & Biomolecular Engineering, and Mechanobiology
- Neural Engineering
- Pharmaceutical Science & Biotechnology
- **Biomedical Education**
- **Biomedical Innovation Technology and Industry**

### PUBLICATION

*Selected abstracts with solid scientific work will be invited to submit full papers and published on the chosen SCI or EI indexed journals after peer-review process*

### CONTRIBUTED PAPERS

*All participants attending the WACBE2013 are invited to submit abstracts. Please visit the [conference website: wacbe2013.buaa.edu.cn](http://wacbe2013.buaa.edu.cn), download and complete the abstract submission form. Prepare the abstract following the abstract format. And email the abstract submission form and abstract to [wacbe2013@buaa.edu.cn](mailto:wacbe2013@buaa.edu.cn)*

### YOUNG INVESTIGATOR'S AWARDS

*Awards for the best papers for innovation will be set up to young investigators (the first author must be either research student or young researcher < 35 years). The abstracts will be shortlisted by a panel under Scientific Program Committee.*

### REGISTRATION FEE

Early registration due: 15th June 2013	Before	After
1. Regular Registration		
-Life Members	USD 300	USD 350
-Members (proof required)	USD 350	USD 400
-Non-members(Full Registration)	USD 400	USD 450
2. Conference Banquet Only	USD 50	USD 60
3. Students (proof required)	USD 150	USD 200
4. Accompany	USD 150	USD 200

### SPECIAL FORUMS

Biomedical Innovation Technology and Industry Forum and Biomedical Education Forum will be added as two new sessions and highlighted in the program. In the forums, special activities will be organized for young faculty and students to meet world-class distinguished scientists, industry leaders and educational experts and learn from their invited speeches. Extensive discussion will be conducted on hot topics on biomedical education, development of innovation technologies and potential industry-university-research cooperation.

The Mediterranean Conference on Medical and Biological Engineering and Computing is a regional conference with a long tradition and high scientific level, which is organized every three years in a Mediterranean country under the umbrella of the International Federation of Medical and Biological Engineering (IFMBE). For more than 30 years, MEDICON has been a scientific forum for the presentation of the recent advances in the biomedical engineering fields. Authors are invited to submit papers before April 26th 2013 about the following topics:

#### BIOMEDICAL SIGNAL PROCESSING

- Biosignal processing and biological modelling
- Non linear dynamic analysis of biomedical signals
- Signal pattern classification
- Adaptive and parametric filtering
- Time-frequency and time-scale analysis
- Principal component analysis and independent component analysis

#### BIOMEDICAL IMAGING AND PROCESSING

- X-Ray imaging / mammography
- Computed tomography / magnetic resonance imaging / ultrasound imaging
- Optical imaging and microscopy / molecular imaging
- SPECT and PET technologies
- Multimodality imaging
- Image processing

#### MEDICAL DEVICES AND SENSORS

- Ambulatory point-of-care systems, home/personal/independent living
- Medical devices evaluation and standards
- Diagnostic and therapeutic devices
- Therapeutic and diagnostic techniques based on bioelectromagnetic interactions

#### BIO-MICRO AND BIO-NANO TECHNOLOGIES

- Internal, implanted therapeutic devices
- Diagnostic in vitro
- Bionanotechnology, biosensors, biomems and lab-on-a-chip devices
- Therapeutic nanoconjugates and drug delivery systems
- Electrical fields at the cell and protein scale

#### MOLECULAR, CELLULAR AND TISSUE ENGINEERING AND BIOMATERIALS

- Biomaterials cell interactions
- Scaffolds in tissue engineering
- Biomimetic, bioinspired and patterned biomaterials
- Stem cells in regenerative medicine

#### NEURAL AND REHABILITATION ENGINEERING

- Neural interfaces and regeneration
- Brain computer / machines interfaces
- Brain physiology and modelling
- Neural signal processing
- Rehabilitation engineering and wearable technologies

#### BIOMECHANICS, ROBOTICS AND MINIMAL INVASIVE SURGERY

- Cardiovascular Fluid Mechanics / Respiratory Biomechanics
- Prosthetic biomechanics / Rehabilitation robotics
- Robot-aided surgery
- Image-guided surgery
- Minimal invasive surgery and interventions
- Sports biomechanics and human performance

#### CARDIOVASCULAR, RESPIRATORY AND ENDOCRINE SYSTEMS ENGINEERING

- Cardiac and respiratory mechanics, function, modeling and control
- Vascular disease, mechanics and hemodynamics
- Cardiovascular and pulmonary signal processing
- Cellular and molecular cardiorespiratory engineering
- Endocrine systems, function, modeling and control
- Artificial organs
- Cardiac instrumentation and wearable technologies

#### CLINICAL ENGINEERING

- Clinical engineering and health technology management
- Health technology policy and assessment
- Safety and human factors engineering for medical devices and systems
- Social, societal and ethical implications of computing and networking (Compunetics) in medicine and biology / Patient empowerment

#### HEALTH INFORMATICS, E-HEALTH, TELEMEDICINE AND INFORMATION TECHNOLOGY IN MEDICINE, BIOINFORMATICS

- Wireless health technologies and body sensor networks, participatory and personal health systems
- mHealth, eHealth
- Telemedicine
- Ambient assisted living, smart homes
- Health information management, electronic health record
- Knowledge discovery and management for personalized health, decision support methods and systems
- Bioinformatics, biomedical informatics, computational biology, synthetic and systems biology

#### CONTRIBUTED PAPERS

Each contribution must be prepared according to the IFBME Proceedings Series format. Manuscripts should be up to four (4) pages long and should be submitted electronically in their final form before the paper submission deadline, including an abstract, no longer that 300 words. Submissions must include the title of the paper, each author's name and affiliation, the suggested topics in which the paper falls, and the IFBME copyright transfer form. Check the conference website ([www.medicon2013.com](http://www.medicon2013.com)) for specific information on the electronic submission process, detailed publication guidelines and templates. All papers will be peer-reviewed by at least three reviewers from the Scientific International Committee under the supervision of the International Program Committee. They will be judged with respect to their quality, originality, and relevance.

#### IMPORTANT DATES

Proposal of Special Sessions:

**March 1st 2013**

Paper submission:

**April 26th 2013**

Notification of paper acceptance:

**June 14th, 2013**

Final accepted paper submission:

**June 28th 2013**



#### SPECIAL SESSIONS & WORKSHOPS

Prospective organizers are invited to submit proposals for special sessions or workshops to the conference technical secretariat e-mail address ([medicon2013@pacifico-meetings.com](mailto:medicon2013@pacifico-meetings.com)) by March 1st, 2013. Proposals must include a topical title, rationale, session/tutorial outline, contact information, and a description of how the session/tutorial will be organized.

#### PUBLICATION

Conference Proceedings will be published within the *IFBME Proceedings series* (Springer)

#### Journals

The following journals will publish a special issue with extended manuscripts from selected papers submitted to the conference: IEEE Journal on Biomedical and Health Informatics, Micro and Nanosystems Journal

#### Indexing

The proceedings will be indexed in the following scientific databases: ISI, INSPEC, SCOPUS



# MEDICON2013

XIII Mediterranean Conference  
on Medical and Biological  
Engineering and Computing

*Research and Development of Technology for Sustainable Healthcare*



SEVILLA, SPAIN  
September, 25<sup>th</sup> - 28<sup>th</sup> 2013  
[www.medicon2013.com](http://www.medicon2013.com)



## CONFERENCE COMMITTEES

### Conference Chair

Laura M. Roa, *Universidad de Sevilla (Spain)*

### Local Organising Committee Chair

Javier Reina-Tosina, *Universidad de Sevilla (Spain)*

### Publication Committee

Laura M. Roa, *Universidad de Sevilla (Spain)*

Kang-Ping Lin, *Chung Yuan Christian University (Taiwan)*

Igor Lackovic, *University of Zagreb (Croatia)*

Javier Reina-Tosina, *Universidad de Sevilla (Spain)*

### Young Investigator Competition Committee

Marcello Bracale, *Università degli Studi di Napoli Federico II (Italy)*

Fumihiko Kajiya, *Kawasaki University of Medical Welfare (Japan)*

Nicolas Pallikarakis, *University of Patras (Greece)*

Joe Barbenel, *University of Strathclyde (UK)*

Enrique J. Gómez, *Universidad Politécnica de Madrid (Spain)*



## KEYNOTE SPEAKERS

**Dov Jaron** (School of Biomedical Engineering, Science & Health Systems Drexel University)

**Ratko Magjarevic** (University of Zagreb)

**Meyya Meyyappan** (Ames Research Center NASA)

**Alan Murray** (Newcastle University)

**Gunterer Rau** (RWTH Aachen University)

## SPECIAL SESSIONS (CONFIRMED TO DATE)

### • CLINICAL ENGINEERING

Chairs: N. Pallikarakis (University of Patras, Greece), S. Calill (State University of Campinas, Brazil)

### • CARDIAC ARRHYTHMIA - A MULTIDISCIPLINARY APPROACH

Chairs: E. Hofer y G. Plank (TU Graz, Austria)

### • SPECIAL PANEL ON MEDICATIONS AND VACCINES SAFETY

Chairs: L. Kun (National Defense University, USA)

### • STANDARDIZATION, CERTIFICATION, QUALITY AND PERFORMANCE OF MEDICAL AND HEALTHCARE APPLICATIONS

Chairs: H. Hutten (TU Graz) y K. Neuder (VDE-DKE)

### • LEARNING AS A FUNCTIONAL STATE OF THE BRAIN: STUDIES IN WILD-TYPE AND TRANSGENIC ANIMALS

Chairs: J.M. Delgado (Universidad Pablo de Olavide)

## WORKSHOPS (CONFIRMED TO DATE)

### • SPECIAL WORKSHOP AND PANEL ON FOOD SAFETY AND SECURITY

Chair: L. Kun (National Defense University, USA)

### • RESEARCH TRANSFER TO CLINICAL PRACTICE

Chair: M. Desco (Hospital General Gregorio Marañón, Madrid)

### • PATIENT SAFETY AND MEDICAL DEVICES

Chair: N. Pallikarakis (University of Patras, Greece)

## ROUND TABLES (CONFIRMED TO DATE)

### • THE ROLE OF BIOMEDICAL ENGINEERS IN HEALTH CARE TECHNOLOGY ASSESSMENT

Chairs: N. Pallikarakis (University of Patras, Greece), S. Calill (State University of Campinas, Brazil)

### • CLINICAL ENGINEERING WORLDWIDE: PRESENT AND NEAR FUTURE

Chairs: N. Pallikarakis (University of Patras, Greece), S. Calill (State University of Campinas, Brazil)

The site for the Conference is the Meliá Sevilla Hotel (<http://www.melia.com/hotels/spain/seville/melia-sevilla/index.html>), in Seville, the capital of Andalusia. Seville has evolved as a melting pot of cultures with an unparalleled artistic heritage as a consequence of its milenary history. Together with its being a key touristic destination, currently it is a modern city with an outstanding projection at the technological research and industry levels, and biomedical research.

MEDICON 2013 incorporates the XXXI Annual Meeting of the Spanish Society of Biomedical Engineering (CASEIB).

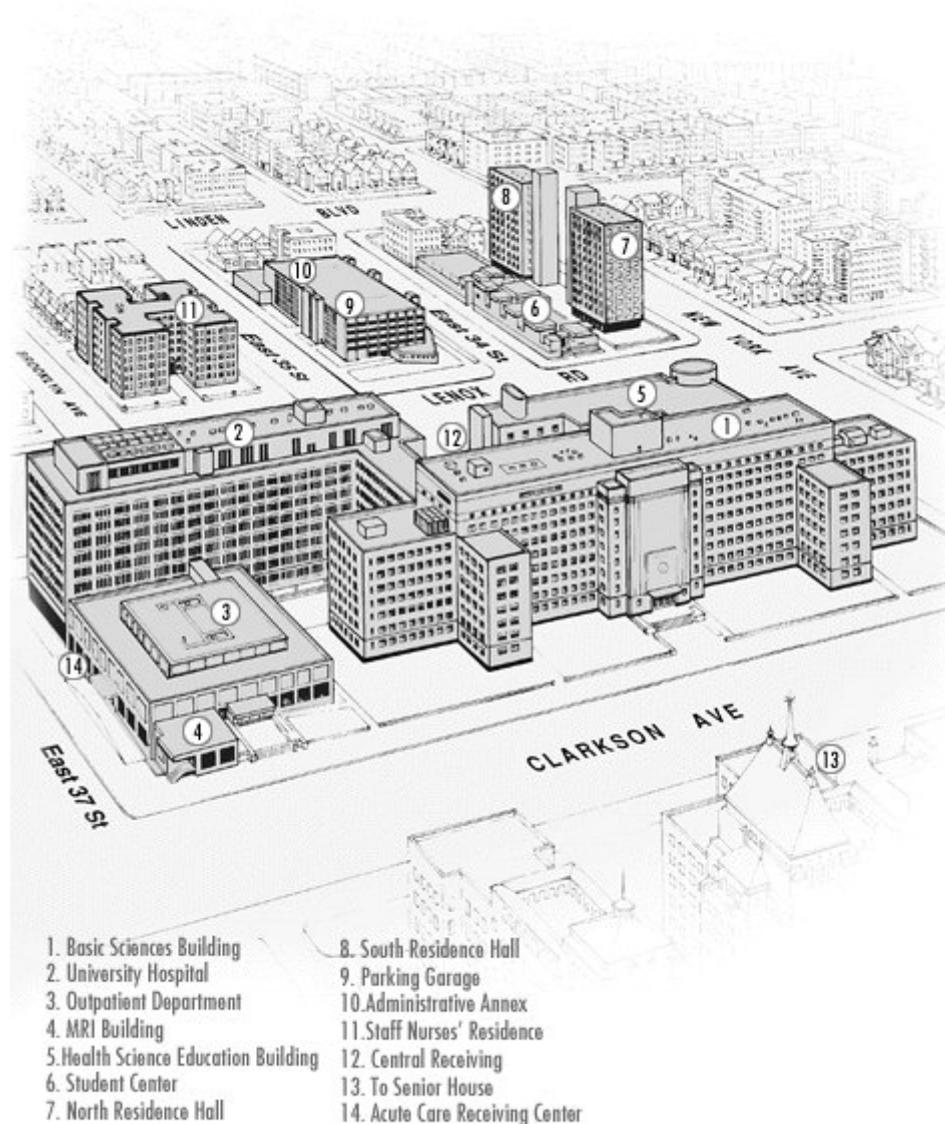
The Conference is organized by the Spanish Society of Biomedical Engineering (SEIB) under the sponsorship of the IFMBE and the University of Sevilla. The IEEE Engineering in Medicine & Biology Society (IEEE-EMBS) is a technical co-sponsor of the Conference.

For any queries, contact the technical secretariat: GRUPO PACÍFICO | Benito Mas y Prat, 5 - 1ª, Oficina 9 | 41005 Sevilla | Tel. (34) 902.108.542 - (34) 954.98.16.81 | Fax. (34) 954.581.200 | [medicon2013@pacifico-meetings.com](mailto:medicon2013@pacifico-meetings.com)



## 7<sup>th</sup> International Conference on Ethical Issues in Biomedical Engineering

This conference is co-sponsored by IFMBE, AIMBE, Sigma Xi and other institutions, and will be held at the SUNY Downstate Medical Center in Brooklyn, New York, April 20 & 21, 2013. The sessions are: Ethical Issues in Biomedical Engineering; Ethics of Stem Cell Use; Ethics Issues in Dentistry; Medicine, Religion and Ethics; Regulation, Law and Ethics; and Research and Medical Ethics. For more information: [www.downstate.edu/orthopaedics/bioethicsconf2013](http://www.downstate.edu/orthopaedics/bioethicsconf2013)





<http://cbms2013.med.up.pt/>

THE 26<sup>th</sup> IEEE INTERNATIONAL SYMPOSIUM ON COMPUTER-BASED MEDICAL SYSTEMS  
**CBMS2013** PORTO

**Welcome!**

26th International Symposium on Computer-Based Medical Systems

June 20-22 : University of Porto, Portugal

The 26th IEEE International Symposium on Computer-Based Medical Systems (CBMS 2013) will be held at the University of Porto, Porto, Portugal, from June 20th to 22th, 2013. The scientific program of CBMS 2013 will consist of regular and special track sessions with technical contributions reviewed and selected by an international programme committee, as well as keynote talks and tutorials given by leading experts in their fields.

Regular and special track presentations will cover a broad range of issues in the following areas:

- Software Systems in Medicine
- Knowledge Discovery Data Mining
- Decision Support Systems
- Medical Robotics
- Medical Data Streams
- Machine Vision in Medicine
- e-Health
- Health and Wellbeing
- Multimedia Biomedical Databases
- Learning methods for skewed data
- Handheld Computing Applications in Medicine
- Computer-Aided Diagnosis
- Knowledge-Based Systems & Techs
- Medical Devices with Embedded Computers
- Signal and Image Processing in Medicine
- Medical Image Segmentation Compression
- twork and Telemedicine Systems
- Medical Databases Information Systems
- Web-Based Delivery of Medical Information
- Content Analysis of Biomedical Image Data
- Pervasive Health Systems and Services



## Some other links

- 1) 35<sup>th</sup> Annual International Conference of the IEEE Engineering in Medicine and Biology Society in conjunction with 52<sup>nd</sup> Annual Conference of Japanese Society for Medical and Biological Engineering (JSMBE)  
July 3-7, 2013  
Osaka Convention Center, Osaka Japan  
<http://embc2013.embs.org/index.html>
  
- 2) The 16<sup>th</sup> International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2013)  
Sep 22-26, 2013  
Toyoda Auditorium, Nagoya University, Nagoya, Japan  
<http://www.miccai2013.org/>
  
- 3) The 15<sup>th</sup> International Conference on Biomedical Engineering (ICBME)  
Dec 4-7, 2013  
U-Town Singapore  
<http://www.icbme.org>