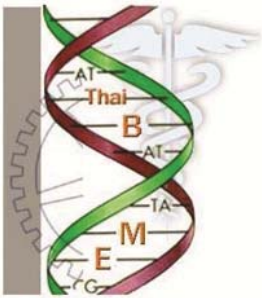

ThaiBME.org

4th Biomedical Engineering International Conference (BMEiCON-2011)

29-30-31 January 2012, Chiang Mai, Thailand

Programs & Abstracts

Proceedings:

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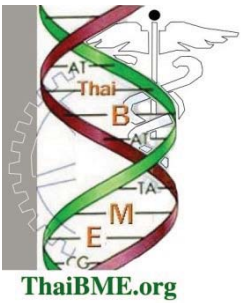
ISBN: 978-1-4577-2188-5

BMEiCON-2011

4th Biomedical Engineering International Conference

29-30-31 January 2012

Chiang Mai, Thailand



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BMEiCON-2011

Similar to that of the past conferences, the 4th BMEiCON still intends to provide an international forum where researchers, practitioners, and professionals interested in the advances in, and applications of, biomedical engineering can exchange the latest research, results, and ideas in these areas through presentation and discussion. Selected papers are encouraged to publish in the International Journal of Applied Biomedical Engineering (IJABME). Paper awards will be given for their distinction. BMEiCON-2011 is technically co-sponsored IEEE Thailand section, EMBS (Thailand Chapter), IEEJ, IFBME and IJABME. Papers accepted by BMEiCON will be made available with IEEE Xplore.

The first BMEiCON was held in Bangkok in 2008 in conjunction with ISBME. Then the 2009 one was organized in Phuket. Successfully, the 3rd BMEiCON was organized in Kyoto, Japan. And this year the BMEiCON is organized again in Thailand (Chiang Mai). From its first launched the conference has drawn more papers from year to year. This reflects well the need and how high the contribution of biomedical engineering to human society.

Initially the BMEiCON-2011 was set to be held in Chiang Mai, Thailand, during 9-11 November 2011. That the event is synchronized with the marvelous and exotic November full-moon celebration, “Loykrathong”. However according to the flood crisis happened in the last quarter of 2011, we had decided to shift the event to 29-30-31 January 2012. The postponed event is also synched well with “The International Horticultural Exposition, Royal Flora; **Ratchaphruek 2011**” another big event that held in Chiang Mai during 14 Dec. 2011 and 14 Mar. 2012. As such the BMEiCON has perfectly aligned with social events as well as social functions that participants and have several choice of varieties.

The organizing committee is pleased to invite all engineers, physicians, scientists, technicians, and technologists to attend and help shaping the future of biomedical technology.

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Message from the President of ThaiBME

Distinguish Guests, Ladies and Gentlemen

It is my great pleasure and honor to welcome all the participants to the 4th Biomedical Engineering International Conference, BMEiCON. We, the Thai Biomedical Research Association, have supported and organized this conference as one of many activities conducted by our association.

The ThaiBME association itself had been found since 2006 by the co-operation of engineers, scientists, medical doctors, dentists, veterinaries, pharmaceutical personnel, nurses, radiation technicians and other health personnel. The main objectives of the association are to promote the research and activities of biomedical engineering nationwide and to provide the forum for researchers and scientists to exchange and discuss matters regarding biomedical engineering and/or related fields. The biomedical engineering has greatly expanded its roles by integrating itself into and utilizing the knowledge and advantages of information technology. The BMEiCON conferences become more and more importance forum for researcher and scientists in such field.

I would like to express my sincere appreciation to all of the conference committee members and staffs for their excellent work and to the authors from around the world for sharing their results by their presentations and discussions. I hope that the participants will enjoy not only the technical aspects of the conference, but also the banquet, northern food, and cultural of Chiang Mai, Thailand.

Some inconveniences may occur during the arranging of the conference, but I do believe that the Organizing Committee Members will do their best to solve and to make sure that you participate in the conference with pleasure. I hope that you will find a good opportunity to meet, to exchange ideas and to make research contacts and collaboration.

Somkiat Wattanasirichaigoon, SWU, Thailand

(ThaiBME Association, President)

General Chair/Co-Chairs' Message

On behalf of the Organizing Committee, it is a pleasure and privilege to invite you to the 4th Biomedical Engineering International Conference (BMEiCON-2011). This year BMEiCON have held several specialties. This is the first time that the event is organized in Chiang Mai. All the participant will realize that this is the right place and the right time of the year. This 4th BMEiCON is also of its first time that the conference is technically supported by IEEE. Paper presented in the conference will be included in IEEE database that can be easily searched via IEEE Xplore.

I do apology those authors who are affected by the postponement of the conference according to the flooding crisis occurred lately. You may experience the un-smooth communication between you and the conference. The committee has tried the best to sort out the problems.

I would like to thank international steering committee member for their fruitful guideline and comments. I also would like to take this opportunity to express our gratitude to all the Organizing Committee members for their highly efforts to make this symposium a great success. I would like to thank Technical Program Chairs and all TPC members for their extreme hard working in handling the technical program. Special thanks go to the Finance Chairs in managing the payment program, Publicity and Publication Chairs, and Local Arrangement Chairs for their significant contributions to make BMEiCON-2011 as success along. I also would like to thank all the speakers and participants. All of you have full-filled the conference functions.

It is a great pleasure for the BMEiCON-2011 that we have four keynote speakers who will share with us the recent and advanced topics in biomedical engineering. Within this couple of days we will have Prof. Akinori Ueno from Tokyo Denki University, Japan, Prof. Tim Gale from university of Tasmania Australia, Prof.Nipon Chattipakorn from Chiang Mai University, Thailand, and Prof. James A. Will from USA.

General Chair
Somsak Choomchuay, KMITL, Thailand
General Co-Chairs
Kosin Chamnongthai, KMUTT, Thailand
Kazuhiko Hamamoto, Tokai Univ., Japan
Adisorn Tuantranont, NECTEC, Thailand

Technical Program Chairs' Message

On behalf of the technical program committee (TPC), we would like to welcome you to BMEiCON2011 -- the International Conference on Biomedical Engineering! This is the fourth year that this conference is being held, and we are very excited about the technical program and what it has to offer to the Biomedical Engineering community. It has been known that on the time that the conference was being held, Thailand had suffered from historical flood. The effect is tremendous and wide spreading to Thai people. The BMEiCON steering committee decides to postpone the conference date from November 9-11, 2010 to January 29-31, 2012.

Despite the natural catastrophe, this year's program continues BMEiCON's tradition of presenting outstanding work that breaks new theoretical ground and provides practical insight into Biomedical Engineering and Biomedical science. The technical program includes 73 high quality papers covering a broad range of important and timely issues in this area with the rejection rate of 15%. Authors from over 15 countries submitted papers, and the final program includes authors from 8 countries. Best paper awards will be selected and recognized in the conference. A select set of high quality papers will be invited to be extended and be considered for potential publication in Internal Journal of Applied Biomedical Engineering (IJABME). BMEiCON2011 is technically co-sponsored IEEE and EMBS (Thailand Chapter). Papers accepted by BMEiCON will be made available with IEEE Xplore.

Chuchart Pintavirooj, KMITL, Thailand
Tohru Yagi, Tokyo Inst. of Tech., Japan
Surapan Yimman, KMUTNB, Thailand
Nipon Theera-Umpon, CMU, Thailand

Committee

International Steering Committee
Chusak Limsakul (Chair), Thailand
Adhi Susanto, Indonesia
Chuchart Pintavirooj, Thailand
Ferdinand F.S. Cohen, USA
Ian Thomas, Thailand
James Koh, Singapore
Kazuhiko Hamamoto, Japan
Kosin Chamnogngthai, Thailand
Ratko Magijarevic, Croatia
Eung Je Woo, Korea
Supaporn Kiattisin, Thailand
Tru Cao, Vietnam
Tsuyoshi Shiina, Japan
Somsak Choomchuay, (Sec.) Thailand

Organizing Committee
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Somkiat Wattanasirichaigoon, SWU, Thailand
Manas Sangworasil, KMITL, Thailand
General Chair
Somsak Choomchuay, KMITL, Thailand
General Co-Chairs
Kosin Chamnongthai, KMUTT, Thailand
Kazuhiko Hamamoto, Tokai Univ., Japan
Adisorn Tuantranont, NECTEC
Technical Program Chairs
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Tohru Yagi, Tokyo Inst. of Tech., Japan
Surapan Yimman, KMUTNB, Thailand
Nipon Theera-Umpon, CMU, Thailand
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Wongwit Senawong, SWU, Thailand
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Information Chair
Supan Tangjitkusolmun, KMITL, Thailand
Special Session Chair
Chanchai Thaijiam, SWU, Thailand
Surapong Chatpun, PSU, Thailand
Yodchanan Wongsawat, Mahidol Univ., Thailand
Publication Chair
Surapan Airphaiboon, KMITL, Thailand
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Ekkarat Boonchieng, CMU, Thailand
Suranan Noimanee, CMU, Thailand
Finance Chair
Sunee Sornchaithanasuk, ThaiBME, Thailand
Piyamas Seu-peng, RSU, Thailand
General Secretary
Adisorn Leelasantitham, MU, Thailand

List of Reviewers

Adisorn Leelasantitham, Mahidol University, Thailand
Chanchai Thaijiam, SWU, Thailand
Chissanuthat Bunluechokchai, KMUTNB, Thailand
Chuchart Pintavirooj, KMITL, Thailand
Ekkarat Boonchieng, Chaingmai University, Thailand
Fernand S. Cohen, Drexel University, USA
Hamamoto Kazuhiko, Tokai University, Japan
Kairoek Choeychuen, Rajamangkala University of Technology Rattanakosin
Kitipol Chitsakul, KMITL, Thailand
Manas Sangworasil, KMITL, Thailand
Pipat Prommee, KMITL, Thailand
Piyamas Suapang, Rangsit University, Thailand
Pornchai Phukpattaranont, PSU, Thailand
Puntani Pongsumpun, KMITL, Thailand
Rachada Kongkajan, Thammasat University, Thailand
Somsak Choomchuay, KMTIL, Thailand
Sorada Kanokpanont, Chulalongkorn University, Thailand
Sumet Umchid, KMUTNB, Thailand
Supan Tungjitkusolmun, KMITL, Thailand
Supaporn Kiattisin, Mahidol University, Thailand
Supot Sookpotharom, BU, Thailand
Suradej Tretriluxana, KMITL, Thailand
Suranan Noimanee, Chaingmai University, Thailand
Surapan Airphaiboon, KMITL, Thailand
Surapan Yimmun, KMUTNB, Thailand
Waranyu Wongseree, Mahidol University, Thailand
Werapon Chiracharit, KMUTT, Thailand
Withawat Withayachumnankul, The University of Adelaide, Australia
Wongwit Senevongse, SWU, Thailand
Yodchanan Wongsawat, Mahidol University, Thailand

Keynote Speaker-1

Recent Advances in Capacitive Sensing of Bioelectrical Signals

(Akinori Ueno; School of Engineering, Tokyo Denki University, Tokyo, JAPAN**)**

Social needs for measuring bioelectrical signals such as electrocardiogram (ECG) in daily life over long periods have been emerging all over the world. To relieve irritation and discomforts experienced with conventional skin-to-electrode coupling, the author proposed capacitive sensing method for obtaining electrocardiographic potential through thin cloth in 2003. The method relies on capacitive coupling involving a conductive electrode, an insulator such as cloths, and the conductive skin. Since the capacitance of the coupling can bring an alternating bioelectric current equivalently through the insulator, the electrode connected with measuring device with high input-impedance can detect the bioelectrical signals over cloths.

Our research group applied the method to ECG measurement on bed, on driving sheet, with driving wheel and with wearable stretchy band. Measured ECG may be used for monitoring infants bearing risk of sudden death, for watching over solitary aged persons, for preventing car accident caused by heart attack of the drivers, or for controlling pedal torque of electrically assisted bicycle.

We also extended the method for measuring electromyogram (EMG), electroencephalogram (EEG), sympathetic nerve activity, and breathing activity. These challenges broaden the potential use of bioelectric signals for human-machine interfaces. Even though the method inherences susceptibility to body motion and power line noise, these drawbacks have lead to some new inventions for improving SNR or tolerance to body motions. Hence, on the whole, the research based on

capacitive sensing method would contribute to progress in ubiquitous healthcare.

Akinori Ueno received B.S. degree in electrical engineering from Keio University, Yokohama, Japan, in 1994, and M.S. and Ph.D. degrees in biomedical engineering from Keio University, Yokohama, Japan, in 1996 and 1999, respectively. In 1999, he joined the faculty of the Electronic and Computer Engineering Department, Tokyo Denki University and is currently an associate professor in the Department of Electrical and Electric Engineering.

Dr. Ueno is the recipient of several research awards from the Society of Instrument and Control Engineers, the Japan Society of Medical Electronics and Biological Engineering, and the Society of Life Support Technology.

He is a member of Institute of Electrical Engineers of Japan and currently is the chairman of Medicine and Biological Engineering Committee in IEEJ. He is also a member of Japanese Society for Medical and Biological Engineering and served as the substitute chairperson of the executive committee of the 48th Annual Conference of Japanese Society for Medical and Biological Engineering. His research interests include bioelectrical signal measurement and its application to human-machine interfaces.

Keynote Speaker-2

Cardiac Electrophysiology and Biomedical Engineering

(Nipon Chattipakorn, Thailand**)**

The most interesting and fascinating issue in biomedical engineering is that it bridges the cores of engineering and medicine into one place. It is well accepted that both engineering and medicine are two broad scientific fields that already have their own significance, and may not need any support from each other. However, history has already demonstrated that with the merge of these two important fields into the currently known “biomedical engineering”, a huge impact on the advancement of biomedical science as well as the improvement in the quality of human lives have been greatly achieved. The groundbreaking discovery and invention of several medical devices in the field of Cardiac Electrophysiology, such as the invention of the implantable cardioverter-defibrillator (ICD) and the discovery of its high efficacy for the treatment of a fatal cardiac arrhythmia, i.e. ventricular fibrillation, is a very good example to emphasize the importance of the existence of Biomedical Engineering. This keynote speech will be an overview of the historical perspective regarding cardiac electrophysiology research, its intimate relationship with biomedical engineering, and how biomedical engineering has helped the rapid scientific advancement in this field. Finally, since our ultimate goal is to decrease and prevent the morbidity and mortality of human lives, it is undoubtedly that biomedical engineering will play a very important role in helping us to achieve this goal in the near future.

Dr. Nipon Chattipakorn received his M.D. from the Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand, and Ph.D. in Physiology and Biophysics from the University of Alabama at Birmingham, Alabama, USA. He is currently a Professor in the Department of Physiology, Faculty of Medicine, Chiang Mai University, and also serves as the Director of the Cardiac Electrophysiology Research and Training (CERT) Center, Faculty of Medicine, Chiang Mai University. He has received many international and domestic scientific awards including the ACC/Procter & Gamble Pharmaceuticals Career Development Award from the American College of Cardiology, Outstanding Visiting Scholar Award from the University of Alabama at Birmingham, the Senior Research Scholar Award from the Thailand Research Fund, and the Gold Elephant Award for Best Researcher in Medical Science from the Chiang Mai University.

Professor Dr. Nipon Chattipakorn's research interest is in the field of cardiac electrophysiology. He has been studying the electrical activity and electrical patterns occurring in the heart during ischemia and reperfusion, using a wide range of study models from cardiac mitochondria and cardiac cells to the bedside level. He has served as the editorial board and reviewer board for many international cardiology and physiology journals. He is also a founder of the Cardiac Electrophysiology Research and Training (CERT) Center at the Faculty of Medicine, Chiang Mai University.

Keynote Speaker-3

From Conception to Market

(James A. Will, USA)

The purpose of this keynote Speech is to acquaint the biomedical engineers of the steps to take to protect their intellectual property and what they need to do if they want to move a medical device to market in the US and similarly in Europe. Prof. James A. Will will share his personal success stories on developing various medical equipments outcomes from our Biomedical

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Jame A. Will Had been working with many universities and organizations; mainly University of Wisconsin, Kansas State University, and University of Liverpool. He had taken full professor, Affiliate Professor and Emeritus Professor of several universities. He also had a great involvement in industries; posts of administrator and board

Keynote Speaker-4

Engaging with the Medical community in Biomedical Engineering Research

Achieving quality outcomes from our Biomedical Engineering research relies on effective engagement with the Medical community. This typically takes the form of collaborative research with clinicians, or clinician-researchers, on issues they identify. While this presents opportunities, there are also significant challenges, and the goal of effective engagement and collaboration can be difficult to achieve. Engaging is a complex process – not only does it bring a "second party" into the research, but the project itself becomes more complex. Here we aim to promote engagement and stimulate discussion by considering the process and challenges together with relevant examples.

We can identify a number of stages in the process of typical clinically-relevant research. The first is the preliminary stage of establishing the collaboration, including identifying appropriate potential clinical partners, identifying the real medical needs, educating biomedical engineers on the required medical knowledge and the surrounding medical culture, and developing mutual understanding and trust between engineering researchers and clinicians. The next stage is defining the problem and issues, and the specific aims and methods for the research. A further stage is attracting sufficient funding and competent research personnel. Subsequent stages are undertaking the core technical developments, gaining appropriate ethical and regulatory approvals, conducting an experimental program and trials, and finally, potentially commercialising developed technology.

A particular challenge for clinicians is to invest the required time and energy in the process. Government, professional and personal incentives for clinicians to be involved in successful collaborative research programs are key factors.

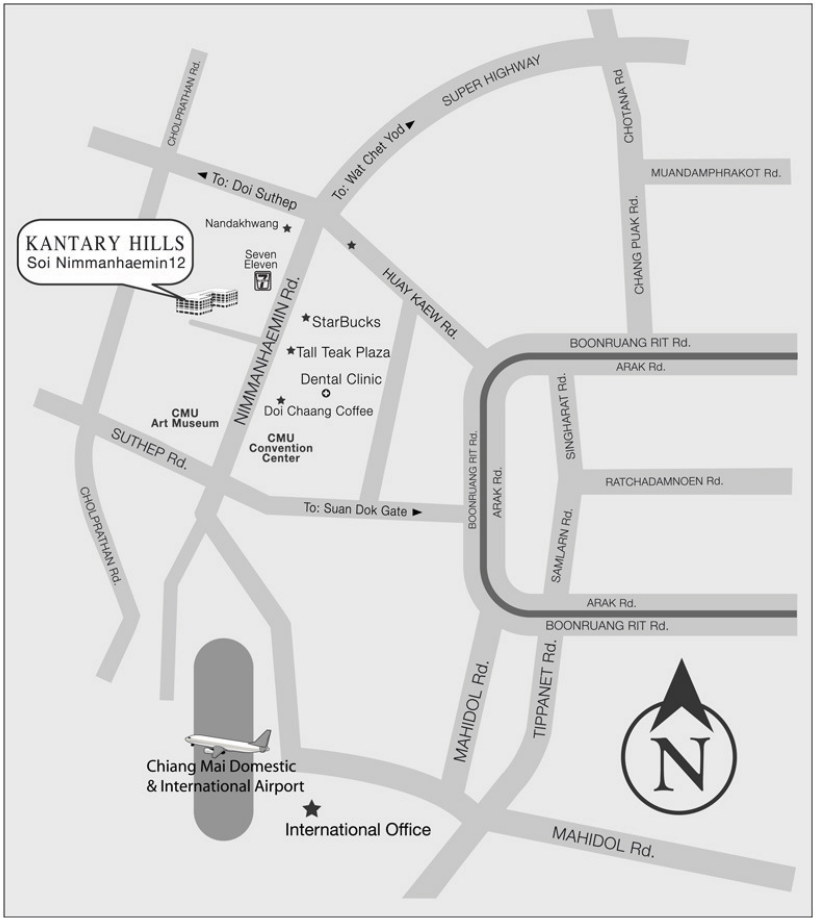
Two case study projects are given as examples. The first involves collaborative research in hospital-based neonatal care. This project comprises research into methods and technology directed at improving the delivery of supplementary oxygen to premature babies, including logging data from babies to assess the performance of current systems, and prototyping an improved oxygen controller.

The second case study involves collaborative research in drug addiction rehabilitation with local community-based clinicians. The research in this project relates to improving the safety of take-home narcotic substitute medication. This includes development of technology for secure storage and delivery of the medication and remote assessment of patients, gaining ethics and regulatory approvals for patient trials, conducting trials and analysing results.

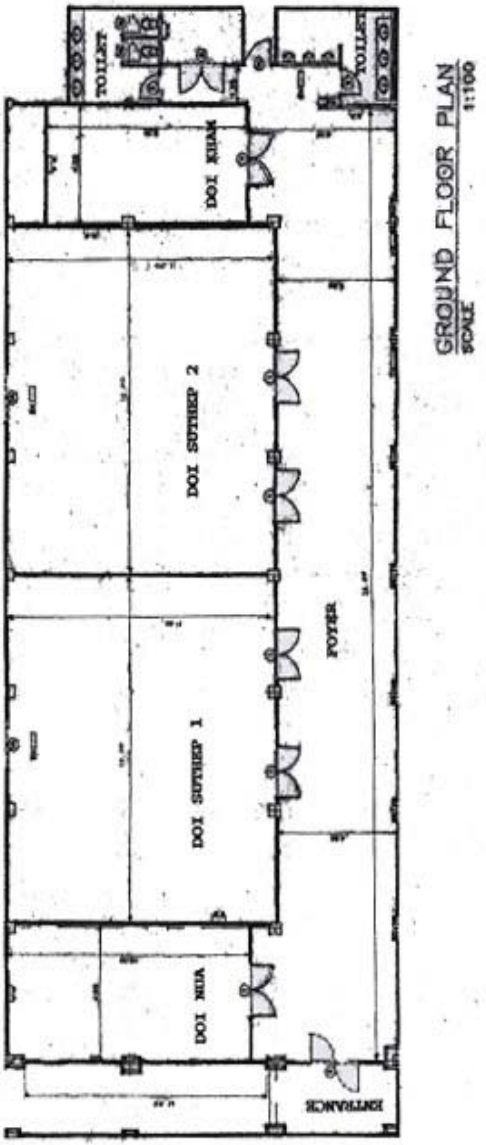
Despite inherent difficulties, the case studies illustrate that the benefits of engagement are substantial, and the insight and expert knowledge of clinician-researchers is paramount to achieving quality outcomes. It is hoped that by exposing the issues, difficulties and benefits of engaging the Medical community, wider discussion will be promoted and effective collaboration encouraged.

Tim Gale received his Bachelor of Engineering degree (Mechanical/Electrical) from the University of Tasmania (UTAS) in 1986, his MEngSc (Research) from the University of Melbourne in 1991, and subsequently a PhD in Biomedical Engineering from UTAS in 1996. For the next five years he held a UTAS academic position teaching pre-clinical material in the UTAS medical degree and with research interests in modelling, simulation and physiology. Following this he worked in industry as an remote sensing scientist. Ten years ago he again returned to UTAS to take up his current appointment leading the Mechatronic Engineering degree program and following his research interests in Biomedical Engineering. His research is currently focused on modelling and technology in respiratory medicine, and improving patient health outcomes through e-Health technologies.

Conference Map



Conference Venue



Program at a Glance

Technical Program

BMECON 2011, 29-30-31 January 2012, Chiang Mai, Thailand

	(Day-1) Sunday, January 29, 2012			
14:00-16:00	Registration			
16:00-17:30	Reception Party (Cocktail)			
	(Day-2) Monday, January 30, 2012			
08:00-08:40	Registration			
08:40-09:00	Opening ceremony - Room Doi Suthep (Grand Hall)			
09:00-09:40	Keynote speaker - Prof.Akinori Ueno			
09:40-10:20	Keynote speaker - Prof.Nipon Chattipakorn			
10:20-10:40	Coffee Break			
Session	Room Doi Suthep	Room Doi Suthep II	Room Doi Nua	
Session Topic	D2R1ML-Imaging and signal I	D2R2ML-Instrumentation I	D2R3ML- Bioinformation	
Chair	Surapan Yimmun	Sura Dej Tretilluxana	Puntani Pongsumpun	
10:40-11:00	ID 00063	ID 00022	ID 00009	
11:00-11:20	ID 00088	ID 00033	ID 00041	
11:20-11:40	ID 00023	ID 00047	ID 00013	
11:40-12:00	ID 00061	ID 00077	ID 00014	
12:00-13:00	Lunch			
Session	Room Doi Suthep	Room Doi Suthep II	Room Doi Nua	
Session Topic	D2R1AE-Imaging and signal II	D2R2AE-Rehabilitation I	D2R3AE-Special session I	
Chair	Theera-Umpon	Sumet Umchid	Yodchanan Wongsawat	
13:00-13:20	ID 00065	ID 00026	ID 00002	
13:20-13:40	ID 00085	ID 00052	ID 00003	
13:40-14:00	ID 00089	ID 00091	ID 00006	
14:00-14:20	ID 00067	ID 00040	ID 00007	
14:20-14:40	ID 00051	ID 00042	ID 00004	
14:40 15:00	Coffee Break			
Session	Room Doi Suthep	Room Doi Suthep II	Room Doi Nua	
Session Topic	D2R1AL-Imaging and signal III	D2R2AL-Mis I	D2R3AL-Special session II	
Chair	Kazuhiko Hamamoto	Sorada Kanogpanont	Chanchai Thaijiam	
15:00-15:20	ID 00066	ID 00039	ID 00013	
15:20-15:40	ID 00048	ID 00046	ID 00014	
15:40-16:00	ID 00079	ID 00081	ID 00015	
16:00-16:20	ID 00086	ID 00056	ID 00016	
16:20-16:40	ID 00055	ID 00076	ID 00017	
16:40-17:00	ID 00019			
17:00-18:00	Free time			
18:00-20:30	Banquet (Authentic Northern)			

	(Day-3) Tuesday, January 31, 2012		
08:00-09:00	Registration		
09:00-09:40	Keynote speaker - Prof.James A.Will		
09:40-10:20	Keynote speaker - Prof.Timothy Gale		
10:20-10:40	Coffee Break		
Session	Room Doi Suthep I	Room Doi Suthep II	Room Doi Nua
Session Topic	D3R1ML-Simulation	D3R2ML-Instrumentation II	D3R3ML-Mis II
Chair	Suparerk Janjarasjtt	Yongyuth Kajornpredanon	Supan Tungjitkusolmun
10:40-11:00	ID 00043	ID 00087	ID 00025
11:00-11:20	ID 00092	ID 00072	ID 00094
11:20-11:40	ID 00049	ID 00078	ID 00073
11:40-12:00	ID 00093	ID 00017	ID 00027
12:00-12:20	ID 00090	ID 00010	ID 00060
12:20-13:20	Lunch		
Session	Room Doi Suthep I	Room Doi Suthep II	Room Doi Nua
Session Topic	D3R1AE-Health care technology	D3R2AE-Tissue and Molecular engineering	D3R3AE-Special session III
Chair	Seiichi SJZUKI	Pattarapong Phasukkit	Timothy Gale
13:20-13:40	ID 00032	ID 00038	ID 50008
13:40-14:00	ID 00035	ID 00044	ID 50009
14:00-14:20	ID 00074	ID 00016	ID 50010
14:20-14:40	ID 00037	ID 00053	ID 50011
14:40-15:00	ID 00029	ID 00071	ID 50012
Erd of Conference, Have a good long weekend Thailand			

TECHNICAL PROGRAM

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Technical Program

Day 1: Sunday, January 29, 2012

14:00-16:00 Registration

Day 2: Monday, January 30, 2012

08:00-08:40 Registration

08:40-09:00 Opening ceremony – Room Doi Suthep (Grand Hall)

09:00-09:40 Keynote speaker-1: Prof.Akinori Ueno

Recent Advances in Capacitive Sensing of Bioelectrical Signals

09:40-10:20 Keynote speaker-2: Prof.Nipon Chattipakorn

Cardiac Electrophysiology and Biomedical Engineering

10:20-10:40 Coffee Break

Session D2R1ML: Imaging and signal I

Chair: Surapan Yimmun

Room: Doi Suthep I

10:40-11:00 PID 00063: Ischemic Stroke Analysis of CT perfusion maps Cerebral Blood Volume and Cerebral Blood Flow Based on Digital Image Processing Techniques
Santichai Fueanggan, Somchart Chokchaitam and Sombat Muengtaweepongsa, Thailand

11:00-11:20 PID 00088: Improvements in Ultrasound Elastography using Dynamic Focusin
Duangporn Lertsilp, Sumeth Umchi, Udomchai Techavipoo and Pairash Thajchayapong, Thailand

11:20-11:40 PID 00023: Time-frequency Analysis for Cancer Detection using Proteomic MS-Spectra
Tulaya Limpiti, Anunchai Assawamakin, Apichart Intarapanich and Sissades Tongsima, Thailand

11:40-12:00 PID 00061: The automated assesment of artery hemodynamic parameters from ultrasound video
Uldis Rubins, Zbignevs Marcinkevics and Anzela Turkina, Latvia

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Session D2R1ML: Instrumentation I

Chair: Suradej Tretrilluxana

Room: Doi Suthep II

10:40-11:00 PID 00022: Development of Finite Element Model for Analysis in the Realistic Human Skull Impact
Pattaraweerin Woraratsoontorn and Pitikhate Sooraksa, Thailand

11:00-11:20 PID 00033: A Design of Configurable ECG Recorder Module
Anucha Punapung, Suradej Tretriluxana and Kitiphol Chitsakul, Thailand

11:20-11:40 PID 00047: On-chip Cell Separation and Manipulation using Traveling Wave Dielectrophoretic Force Controlled by Four-phase Signal Generator
Kata Jaruwongrungsee, Thitima Maturos, Sakshin Bunthawin, Anurat Wisitsoraat, Manas Sangworasil and Adisorn Tuantranont, Thailnad

11:40-12:00 PID 00077: A Measurement of Soft Neurological Signs by Pronosupination using Wireless Acceleration and Angular Velocity Sensors
Miki Kaneko, Keiji Iramina, Yuichiro Kamei and Yoshinori Katayama, Japan

---

Session D2R3ML: Bioinformation

Chair: Puntani Pongsumpun

Room: Doi Nua

10:40-11:00 PID 00009: Mathematical Model for the Secondary Infection of Infectious Disease with Incorporated the Disease Induced Death Rate
Rujira Kongnuy and Ekachai Naowanich, Thailand

11:00-11:20 PID 00041: Investigation of HC04 human hepatocyte cells interaction with fibronectin and gelatin plated on paper for cell based sensor application
Uraiwan Waiwijit, Anurat Wisitsoraat, Adisorn Tuantranont, Bovornlak Oonkhanond and Wonphorn Kandhavivorn, Thailand

11:20-11:40 PID 00013: Malaria transmission model of juvenile and adult humans
Puntani Pongsumpun and Preeyaporn Mumtong, Thailand

11:40-12:00 PID 00014: Stability and Lyapunov Functions for the Dynamics of Leptospirosis
Rujira Kongnuy and Ekachai Naowanich, Thailand

Day 2: Monday, January 30, 2012

12:00-13:00 Lunch

Session D2R1AE: Imaging and signal II

Chair: Theera Umpon

Room: Doi Suthep I

13:00-13:20 PID 00069: Automatic Segmentation and Degree Identification in Burn Color Images
Kittichai Wantanajittikul, Nipon Theera-umpon, Sansanee Auephanwiriyakul and Taweethong Koanantakool, Thailand

13:20-13:40 PID 00085: Basic Investigation of Breast Cancer Detection in Early Stage Using Microwave Radiation: Finite Element Analysis Approach
Arthorn Sanpanich, Pattarapong Phasukkit, Supan Tungjitkusolmun, Chuchart Pintavirooj and W.Wongtrairat, Thailand

13:40-14:00 PID 00089: Detection of Disk Drug Orientation for Disk Diffusion Susceptibility Testing
Thitikarn Okowat, Somchat Taertulakarn, Seksun Samosornsuk and Chuchart Pintavirooj, Thailand

14:00-14:20 PID 00067: Development of automatic recognition software of left ventricle by time series processing echocardiograms and application to disease heart
Shogo Takeshima, Hideyuki Matsuda, Takashi Yoshinaga and Kohji Masuda, Japan

14:20-14:40 PID 00051: Driver Fatigue Monitoring System Using Video Face Images & Physiological Information
Sasiporn Anumas and Soo-chan Kim, South Korea

Session D2R2AE: Rehabilitation I

Chair: Sumet Umchid

Room: Doi Suthep II

13:00-13:20 PID 00026: Evaluation of the effect of cosmetic therapy by EEG
Akiko Machida, Maki Shirato, Sadaki Takata, Yoshihiro Atsumi and Tohru Yagi, Japan

13:20-13:40 PID 00052: SURFACE EMG BASED CONTROLLER DESIGN FOR KNEE REHABILITATION DEVICES
Jutamanee Poonsiri and Warakorn Charoensuk, Thailand

13:40-14:00 PID 00091: Design and Development of Touch Screen Based Continuous Passive Motion Device for Knee Rehabilitation
Jidapa Rattarojpan and Sumet Umchid, Thailand

14:00-14:20 PID 00040: Alphabet Matrix Layout in P300 Speller May Alter its Performance
Yohei Sakai and Tohru Yagi, Japan

14:20-14:40 PID 00042: Industrial Community Odor Monitoring Utilizing Wireless Electronic Nose for Human Health Protection
Tawee Pogfay, Natthapol Watthanawisuth, Anurat Wisitsoraat, Tanom Lomas and Adisorn Tuantranont, Thailand

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Session D2R3AE: Special session I

Chair: Yodchanan Wongsawat

Room: Doi Nua

13:00-13:20 PID 50002: Illuminant Effect on LCD and LED Stimulators for P300-based Brain-Controlled Wheelchair
Dilok Puanhvuan and Yodchanan Wongsawat, Thailand

13:20-13:40 PID 50003: ROI Detection of Reading Process Using ANFIS Method
Pongphan Pongpanitanont, Thunyanoot Prasertsakul, Wichian Sittiprapaporn and Warakorn Charoensuk, Thailand

13:40-14:00 PID 50006: Selection and removal of artifacts in EEG based on independent components
Takahiro Ikuno, Yoshinori Katayama and Keiji Iramina, Japan

14:00-14:20 PID 50007: Focal Potassium Microinjection in Rat Hippocampal Slices Inducing Interictal Activities
Tassanai Parittotokkaporn, Jarinratn Sirirattanapan, Penning Yu, Min-chi Hsiao, Dong Song and Theodore W. Berger, Thailand

14:20-14:40 PID 50004: Development of e-Health Application for Medical Center in National Broadband Project
Kittinan Noimanee, Suranan Noimanee, Somkiat Wattanasirichaigoon, Niyom La-oopugsin, Visarn Mahasitthiwat, Supan Tungjitkusolmun and P. Ratleadkarn, Thailand

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Day 2: Monday, January 30, 2012

14:40-15:00 Coffee Break

Session D2R1AL: Imaging and signal III

Chair: Kazuhiko Hamomoto

Room: Doi Suthep I

15:00-15:20 PID 00066: DEVELOPMENT OF COOPERATE SYSTEM WITH MEDICAL ROBOT TO ALLEVIATE FATIGUE IN ECHOGRAPHY
Kohji Masuda, Yasuhiro Urayama, Shun Saito and Yuuki Takachi, Japan

15:20-15:40 PID 00048: Signal Processing for Heart Rate Variability Data Analysis Case Study: Ventricular Tachycardia condition
Pimporn Muaynoi, Suradej Tretriluxana and Kitipol Chitsakul, Thailand

15:40-16:00 PID 00079: Novel of Amplitude Compensation for Digital Signal Processing System with Minimum Phase Filter
Sukanya Praesomboon, Kobchai Dejhan, Surapun Yimman and Chanchai Phromlikhit, Thailand

16:00-16:20 PID 00086: Real Time Human Fall Detection by Wide Angle Camera Overhead Install
Tanakorn Suntornwat and Pranchalee Rattanasakornchai, Thailand

16:20-16:40 PID 00059: Counting Number of Points for Acne Vulgaris Using UV Fluorescence and Image Processing
Manita Khongsuwan, Supaporn Kiattisin, Waranyu Wongseree, and Adisorn Leelasantitham, Thailand

16:40-17:00 PID 00019: Guidelines for Virtual Simulator Sickness Experimentation
Chompoonuch Jinjakam and Kazuhiko Hamamoto, Japan

Session D2R2AL: Mis I

Chair: Sorada Kanogpanont

Room: Doi Suthep II

15:00-15:20 PID 00039: Detection of Mycobacterium tuberculosis by using loop-mediated isothermal amplification combined with a lateral flow dipstick biosensor

Thongchai Kaewphinit, Somchai Santiwatanakul, Pronpan Jaratsing, Kosum Chansiri, Narong Arunrut and Wansika Kiatpathomchai, Thailand

15:20-15:40 PID 00046: Salmonella Cell Rupture on a Microfluidic Chip Using Electroporation Technique
Siriporn Jaikla, Thitima Maturos, Tawee Pogfay, Chatchai Neatpisarnvani, Pornpimol Sritongkham and Adisorn Tuantranont, Thailand

15:40-16:00 PID 00081: Experimental Study of Digital Microfluidic Biochip
Kessararat Ugsornrat, Tawee Pogfai, Thitima Maturos, Anurat Wisitsoraat and Adisorn Tuantranont, Thailand

16:00-16:20 PID 00056: Cholesterol Biosensor based on Direct Electron Transfer of Cholesterol Oxidase on Multi-wall Carbon Nanotubes
Saithip Pakapongpan, Pornpimol Sritongkham and Adisorn Tuantranont, Thailand

16:20-16:40 PID 00076: Phthalocyanine/graphene hybrid-materials for gas sensing in bio-medical applications
Johannes Philipp Mensing, Chakrit Sriprachuabwong, Anurat Wisitsoraat, Teerakiat Kerdcharoen and Adisorn Tuantranon, Thailand

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Session D2R3AL: Special session II

Chair: Chanchai Thaijiam

Room: Doi Nua

15:00-15:20 PID 50013: A Single Tooth Segmentation Using Structural Orientations and Statistical Textures
Pramual Choorat, Werapon Chiracharit and Kosin Chamnongthai, Thailand

15:20-15:40 PID 50014: Engaging with the Medical Community in Biomedical Engineering Research
Timothy J. Gale, Clive R. Stack and Peter A. Dargaville, Australia

15:40-16:00 PID 50015: Body Area Network Measurement with Ultra Wideband Technology
Dissakan Arpasin, Musleemin Noitubtim, Narongsak Manositthichai, and Sathaporn Promwong, Thailand

16:00-16:20 PID 50016: Antenna Transfer Function Evaluation Scheme for Ultra Wideband Medical Applications
Krisada Koonchiang, Narongsak Manositthichai, Chalermpan Fongsamut and Sathaporn Promwong,Thailand

16:20-16:40 PID 50017: Evaluation of Ultra Wideband Body Area Network
Bundit Ruckveratham, Sanit Teawehim, Poramade Chiochan and Sathaporn Promwong, Thailand

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Day 3: Tuesday, January 31, 2012

08:00-09:00 Registration

09:00-09:40 Keynote speaker-3: Prof.James A.Will

From Conception to Market

09:40-10:20 Keynote speaker-4: Prof.Timothy Gale

Engaging with the Medical community in Biomedical Engineering Research

10:20-10:40 Coffee Break

Session D3R3ML: Imaging and Signal IV

Chair: Suparerk Janjarasjitt

Room: Doi Suthep I

10:40-11:00 PID 00043: Comparision of Open Slot Angle for Asymmetry Slot Antenna using 3D Finite Element Method
Krisada Thaiwat, Petch Nantivatana, Pattarapong Phasukkit, Supan Tungjitkusolmun and Manas Sangworasil, Thailand

11:00-11:20 PID 00092: Discrete Mathematical Model of Chest thickness Using Kernel Function for Optimum kVp and mAs of Computed Radiography
Sudarath Suntaropas, Surapun Yimman, Rodjarin Boontawan and Kobchai Dejhan, Thailand

11:20-11:40 PID 00049: Knee Angle Model of Prosthesis for Stair Ascending Gait Detection
Jutamat Pinitlertsakun and Warakorn Charoensuk, Thailand

11:40-12:00 PID 00093: MATHEMATICAL MODEL OF AUDIOGRAM WITH SECOND ORDER RECURSIVE SYSTEM
Thitaphan Jongsataporn, Surapun Yimman, Sukanya Praesomboon and Kobchai Dejhan, Thailand

12:00-12:20 PID 00090: Robustness of Geodesics to Affine Transformation
Chaiyaporn Panyindee, Prasong Tosranon and Chuchart Pintavirooj, Thailand

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Session D3R2ML: Instrumentation II

Chair: Yongyuth Kajornpredanon

Room: Doi Suthep II

10:40-11:00 PID 00087: Non-invasive Blood Pressure Measurement: Auscultatory method versus Oscillometric method
Somsri Daochai, Watchara Sroykham, Yongyuth Kajornpredanon and Chainapat Apaiwongse, Thailand

11:00-11:20 PID 00072: Design and Construction of Control Expiratory Time Adjustment Display Knob for the Bird Mark 7 Ventilator
Nuntachai Thongpance, Thanakorn Yooto and Neungluethai Boorasit, Thailand

11:20-11:40 PID 00078: An Insole Point Pressure Monitoring System
Apisit Numchaichanakij, Kitiphol Chitsakul and Suradej Tretriluxana, Thailand

11:40-12:00 PID 00017: An Instrumentation Design for Microsignal Output From Piezoresistive Microcantilever Biosensor For Human Stress
Lee Yoot Khuan, Mohd Ismarul A. Ismai, Abdul Razak M S. Hamid, Ilham Rustam, Maureen S. A. Bujang, Mohd Firdaus Abdullah, Nina Korlina Madzhi and Anuar Ahmad, Malaysia

12:00-12:20 PID 00010: Effect of the Short-Term Magnetic Stimulation by rTMS on P300 Latency
Tetsuya Torii, Aya Sato, Yoshiyuki Masada, Yukiko Nakahara, Masakuni Iwahashi and Keiji Iramina, Japan

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Session D3R3ML: Simulation

Chair: Supan Tungjitkusolmun

Room: Doi Nua

10:40-11:00 PID 00025: Development of Electric Field Sensing System as A Putative Skin Sensation Sensor
Seiichi Suzuki, Yuiko Saegusa and Tsutomu Takahashi, Japan

11:00-11:20 PID 00094: Stability Characteristics of Patellofemoral Prostheses: an in-vitro pilot study
Wongwit Senavongse, Thailand

11:20-11:40 PID 00073: HOW TO MAKE AN EASY HUMAN THORAX MODEL
Chanchai Thaijiam, Thailand

11:40-12:00 PID 00027: A Wireless networked smart-shoe system for monitoring human locomotion
Wathang Donkrajang, Natthapol Watthanawisuth, Johannes Philipp Mensing and Teerakiat Kerdcharoen, Thailand

12:00-12:20 PID 00060: Counting Number of Sweat Glands Using Image Processing
Narutchai Pakkaselevat, Supaporn Kiattisin, Waranyu Wongseree, and Adisorn Leelasantitham, Thailand

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Day 3: Tuesday, January 31, 2012

12:00-13:00 Lunch

Session D3R1AE: Health care technology

Chair: Seiichi SUZUKI

Room: Doi Suthep I

13:00-13:20 PID 00032: Breath Monitoring based on the Optical Electronic Nose System

Arunee Eambaipreuk, Sumana Kladsomboon and Teerakiat Kerdcharoen, Thailand

13:20-13:40 PID 00035: Sensor Pillow System: Monitoring Cardio-Respiratory and Posture Movements During Sleep
Shongpun Lokavee, Natthapol Watthanawisuth, Johannes Philipp Mensing and Teerakiat Kerdcharoen, Thailand

13:40-14:00 PID 00074: The Survey on Medical Equipment Maintenance System in General Hospitals of Thailand
Palinee Jamkrajang, Somsri Daochai, Watchara Sroykham, Yongyuth Kajornpredanon and Chainapat Apaiyongse, Thailand

14:00-14:20 PID 00037: Implementation of a Human Vital Monitoring System using Ad Hoc Wireless Network for Smart Healthcare
Poramin Insom, Pakorn Wongpanitlert, Jakree Tipsupa, Kritsakorn Rakjang, Kamol Kaemarungsi and Pakorn Watanachaturaporn, Thailand

14:20-14:40 PID 00029: Investigation on The Ion Concentration Effect on Eucalyptus Root Growth in a.c. Electric Field
Tomoyo Hotta, Seiichi Suzuki and Tsutomu Takahashi, Japan

Session D3R2AE: Tissue and Molecular engineering

Chair: Pattarapong Phasukkit

Room: Doi Suthep II

13:00-13:20 PID 00038: Evaluation Method for Ion Transport via Nanopores: Toward a Neural Stimulation Electrode Using Membrane Protein
Yoshikazu Ishii, Michiko Sugawara and Tohru Yagi, Japan

13:20-13:40 PID 00044: Optimal Matrix Size for Analysis of Tissue Engineering Scaffold Stiffness: A Finite Element Study
Nattapon Chantarapanich, Puttisak Puttawibul, Pongnarin Jeamwatthanachai, Kriskrai Sitthiseripratip, Sedthawatt Sucharitpwatskul and Apinya Laohaprapanon, Thailand

13:40-14:00 PID 00016: Gait Characterizations under Dynamic Load during Walking in Hemiplegic Patients
Suwaporn Sanghan, Surapong Chatpun and Wipawan Leelasamran, Thailand

14:00-14:20 PID 00053: Real-time monitoring Glucose by used Microwave Antenna apply to Biosensor
Sujitra Wiwatwithaya, Pattarapong Phasukkit, Supan Tungjitkusolmun and Wannaree Wongtrairat, Thailand

14:20-14:40 PID 00071: Fingerprint Matching With Cross Correlation and Minutiae Scores
Souksamy Insankeovily, Poramate Prasarn and Somsak Choomchuay, Thailand

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Session D3R3AE: Special session III

Chair: Timothy Gal

Room: Doi Nua

13:00-13:20 PID 50008: Fabrication of novel shark collagen-pectin scaffolds for tissue engineering
Yaowaporn Sangsen, Soottawat Benjakul and Kwunchit Oungbho, Thailand

13:20-13:40 PID 50009: Optimal Parameters of Electroporation for Gene and Tissue
Somphop Rodamporn, Thailand

13:40-14:00 PID 50010: Biomimetic materials as scaffolds for tissue engineering
Jirut Meesane, Thailand

14:00-14:20 PID 50011: Biomedical Application of Thai silks
Sorada Kanokpanont, Siriporn Damrongsakkul and Piyanuch Thitiwuthikiat, Thailand

14:20-14:40 PID 50012: Feasibility of using alginate/gelatin composite scaffold for human chondrocyte regeneration
Phatcharapa Osateerakun, Somsak Kuptniratsaikul, Tanom Bunaprasert, Sorada Kanokpanont and Pibul Itiravivong, Thailand

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