2018 International Conference on Medical and Health Informatics

Program Book

June 8-10, 2018

University of Tsukuba, Tsukuba City,

Japan

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Table of Contents

Welcome Address

We are pleased to welcome you to the 2018 International Conference on Medical and Health Informatics that will take place at Tsukuba city, Japan during June 8-10, 2018.

After several rounds review procedure, the program committee accepted those papers to be published in conference proceedings and special journals. We wish to express our sincere appreciation to all the individuals who have contributed to ICMHI 2018 conference in various ways. Special thanks are extended to our colleagues in program committee for their thorough review of all the submissions, which is vital to the success of the conference, and also to the members in the organizing committee and the volunteers who had dedicated their time and efforts in planning, promoting, organizing and helping the conference. Last but not least, our special thanks go to Honorary Chairs, Professor Chuen-Sheng Cheng and Prof. John Mantas for all the kind and patient support and assistance they offered to our whole conference procedure. Without them, our conference could not be prepared so smoothly, thanks again.

This conference program is highlighted by six Keynote Speakers: Prof. Reinhold Haux, Director at the Peter L. Reichertz Institute for Medical Informatics of the University of Braunschweig - Institute of Technology and Hannover Medical School, Germany; Prof. Tetsuya Sakurai, Director of Center for Artificial Intelligence Research (C-AIR) at the University of Tsukuba, Japan; Prof. Taka-Aki Sato, Director of R&D Center for Precision Medicine in University of Tsukuba, Japan; Prof. Chien-Lung Chan, from Department of Information Management, Yuan Ze University, Taiwan; Prof. Chung-Li Tseng, from UNSW Business School, University of New South Wales in Sydney, Australia; Prof. Kiyoshi Hoshino, from Tsukuba University, Japan. Four Invited Speakers: Prof. Michael T S Lee, from Fu Jen Catholic University, Taiwan; Prof. Yen-Wei Chu, from National Chung Hsing University, Taiwan; Prof. Ayako Okuyama, from National Cancer Centre, Japan; Prof. Yuri Ito, from Osaka International Cancer Institute, Japan.

ICMHI 2018 has received 187 submissions (full papers and abstracts) and only 68 full papers and 38 abstracts were accepted based on the anonymously review results from the technical committee members. Only the outstanding submissions were chosen to be presented during the conference.

ICMHI 2018 aims to bring together outstanding scholars, researchers, and students to exchange and share their experiences and research results about all aspects of Medical and Health Sciences. It is a great plat form to discuss the most recent innovations, trends, and concerns, practical challenges encountered and the various solutions in the fields of medical and health informatics.

Tsukuba City is one of the most interesting city in Japan, vibrant and cultural place. It is blessed with a number of interesting placed that are culturally endowed and these can be explored at length on foot.

Finally we would like to wish you success in your technical presentations and social networking. Hope your stay in Tsukuba City will be memorable!

ICMHI 2018

Organizing Committee

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Dr. Yu-Chih Liu, Yuan Ze University, Taiwan

Publications

Accepted papers of ICMHI 2018 will be published in International Conference Proceedings Series by ACM, which will be archived in the ACM Digital Library, and indexed by Ei Compendex and submitted to be reviewed by Scopus and Thomson Reuters Conference Proceedings Citation Index (ISI Web of Science).

Special Journal Issues

All submitted full paper will have opportunities for consideration for the Special Journal Issue. The final decision for paper selection will be made based on peer review reports by the Guest Editors.

1. [SCI] Special Issue International Journal of Medical Sciences (IF 2.399, the top 8.2% (422/5157) of MEDICINE, GENERAL & INTERNAL)

The theme: Computational Intelligence Methodologies Meets Recurrent Cancers/ Multiple Primary Malignant Neoplasms (MPMNs) – From Prediction to Prognosis

http://www.medsci.org/ms/submit?subgroup=ccchang

2. [SCI] Special Issue Open Medicine (IF 0.294, MEDICINE, GENERAL & INTERNAL)

The theme: Computational Intelligence Methodologies Meets Recurrent Cancers – From Prediction to Prognosis

https://www.degruyter.com/page/1755

3. [EI Compendex/ Engineering Village (Elsevier)] Special Issue International Journal of Computers and Applications

The theme: Computational Intelligence Technologies for Clinical Decision Support-From Prognosis to Prediction

http://explore.tandfonline.com/cfp/est/jmr04962-tjca-si-computational-intelligence?utm_source=CPB&utm_medium=cms&utm_campaign=JMR04962

4. [EI COMPENDEX/Scopus] Special Issue Journal of Quality (JOQ)

The theme: Seamless Ubiquitous Information Technologies and Applications in Healthcare Environment http://aspers.airiti.com/aspers/webHome.aspx?jnliid=J0053

5. [EI INSPEC/Scopus/ProQuest/Google Scholar] Special Issue International Journal of Business and Systems Research

The theme: Seamless Ubiquitous Information Technologies and Applications in the Evolution of Medical Informatics

http://www.inderscience.com/info/ingeneral/cfp.php?id=4055

6. International Journal of Revenue Management (Ei Inspec/EconLit/Scopus/ProQuest/Google Scholar)

7. [EI INSPEC/Google Scholar] International Journal of Management, Economics and Social Sciences

The theme: User-Oriented Seamless Healthcare Service in the Ubiquitous Environmenta http://www.ijmess.com/conference.php

8.Chung Shan Medical Journal (CSMJ) indexed by TSCI (Taiwan Science Citation Index).

9. Journal of Data Analysis (EconLit/ACI)

10. Journal of Data Science (EBSCO/Statistics/Zentralblatt MATH)

Presentation Instructions

Instructions for Oral Presentations

Devices Provided by the Conference Organizer:

Laptop Computer (MS Windows Operating System with MS PowerPoint and Adobe Acrobat Reader)
Digital Projectors and Screen
Laser Sticks

Materials Provided by the Presenters:

PowerPoint or PDF Files (Files should be copied to the Conference laptop at the beginning of each Session.)

Duration of each Presentation (Tentatively):

- Regular Oral Presentation: about **12** Minutes of Presentation including **2** Minutes of Q&A.
- Student Essay Competition Presentation: about **12** Minutes of Presentation including **2** Minutes of Q&A.
- Keynote Speech: about **30** Minutes of Presentation including **5** Minutes of Q&A.
- Invited Speech: about **20** Minutes of Presentation including **3** Minutes of Q&A.

Instructions for Poster Presentation

Materials Provided by the Conference Organizer:

The place to put poster

Materials Provided by the Presenters:

Home-made Posters
Maximum poster size is A1
Load Capacity: Holds up to 0.5 kg

Best Presentation Award

One Best Presentation will be selected from each session (including poster session), One Best Student Essay will be selected from each group (PhD group, master group and undergraduate group) of the student essay competition (totally 3 best essays). The Certificates will be awarded at closing ceremony at the end of the conference.

Dress code

Please wear formal clothes or national representative of clothing.

Speakers Information

Keynote Speaker I

Prof. Reinhold Haux
Peter L. Reichertz Institute for Medical Informatics
University of Braunschweig - Institute of Technology and Hannover Medical School, Germany

Reinhold Haux is Professor for Medical Informatics and Director at the Peter L. Reichertz Institute for Medical Informatics of the University of Braunschweig - Institute of Technology and Hannover Medical School, Germany.

His current research fields are health information systems and management, and health-enabling technologies. Reinhold Haux was, among others, co-chairing the Lower Saxony Research Network Design of Environments for Ageing, where more than 60 researchers are involved in inter- and multidisciplinary research on information and communication technologies for promoting and sustaining quality of life, health and self-sufficiency.

Prof. Haux is author and editor of more than 400 publications. He has supervised about 50 doctoral theses. For the term 2007-2010 Reinhold Haux was President of the International Medical Informatics Association (IMIA), an NGO of the World Health Organisation. From 2001-2015 He was editor of the journal Methods of Information in Medicine, where he is now senior consulting editor. He has, from 2001 to 2007, co-edited the IMIA Yearbook of Medical Informatics. Reinhold Haux has advisory functions in science, economy, and government. Details at “www.plri.de”.

Seamless Interactivity in The Age of Digitization: On Future Services for Patient-centered Health Care

Abstract

Digitization has meanwhile become a priority for governments and societies (e.g. [1] for Germany). In the context of the United Nation's Sustainable Development Goals it is mentioned that the "spread of information and communications technology and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies, as does scientific and technological innovation across areas as diverse as medicine and energy" ([2]). Health care in this new age of digitization is affected in many ways (e.g. [3], [4]). In [5] "seamless interactivity with automated data capture and storage for patient care, and beyond" has been proposed as a major area of research for "good medicine and good health for the individual". The objective of this plenary speech is to discuss, what seemless interactivity means in our current age of digitization, how patients can benefit from new services for health care, based on these developments, and what risks have to be considered.

References

[1] Scheer AW, Wahlster W. Saarbrücken Declaration for a digitization push in Germany (Saarbrücker Manifest für einen Digitalisierungsruck in Deutschland). November 2016 (in German). https://www.scheer-group.com/Scheer/uploads/2016/11/Scheer_Saarbrücker-Manifest.pdf. Last access: August 8, 2017.

[2] Transforming our world: the 2030 Agenda for Sustainable Development. Resolution 70/1 adopted by the United Nation's General Assembly on 25 September 2015. http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E. Last access: August 8, 2017.

[3] Martin-Sanchez FJ, Lopez-Campos GH. The new role of biomedical informatics in the age of digital medicine. Methods Inf Med. 2016; 55: 392-402.

[4] Knaup P, Ammenwerth E, Dujat C, Grant A, Hasman A et al. Assessing the prognoses on health care in the information society 2013 - thirteen years after. J Med Syst. 2014; 38: 73.

[5] Haux R. Medical informatics: past, present, future. Int J Med Inform. 2010; 79: 599-610.

Keynote Speaker II

Prof. Tetsuya Sakurai
Director of Center for Artificial Intelligence Research (C-AIR) at the University of Tsukuba, Japan

Dr. Tetsuya Sakurai is a Professor of Department of Computer Science, and the Director of Center for Artificial Intelligence Research (C-AIR) at the University of Tsukuba. He is also the Chief Executive Officer of MathDesign, LLC. He received a Ph.D. in Computer Engineering from Nagoya University in 1992. His research interests are in the area of computational mathematics and numerical algorithms, specifically, he is interested in high performance algorithms for large-scale computer simulations, data analysis and machine learning.

Matrix Computation-based Approach for Large-scale Simulation and Data Analysis

Abstract

Matrix computations arise in a wide variety of scientific and engineering applications such as nano-scale simulations, structural analysis, data analysis, deep neural networks, etc. We have been developing matrix computation algorithms incorporation with researchers in different application fields. In this talk, we show an approach for simulation and data analysis using matrix computations. Recently, deep neural networks (DNNs) has attracted attention for high accuracy in many application fields. The learning process of DNNs is mainly regarded as computation of weight matrices for connections of artificial neurons. In this context, we have proposed an algorithm to compute weight matrices using non-negative matrix factorizations, in which optimization processes are performed by calculating weight matrices alternately. We also show dimensionality reduction methods that find some characteristics of target data using eigenvalue computation. For large-scale eigenvalue computations, we have been developing an eigen-analysis engine. It achieves high performance on massively distributed parallel computers. We show some numerical experiments of proposed algorithms for both simulation and data analysis.

Keynote Speaker III

Prof. Taka-Aki Sato

Director of R&D Center for Precision Medicine in University of Tsukuba, Japan

Prof. Taka-Aki Sato is now the director of R&D Center for Precision Medicine in Tsukuba University, which is currently focusing on the multi-omics analyses including the whole genome sequencing-based approaches for the development and/or progression of human cancers as well as the liquid biopsy. He is currently conducting several research laboratories collaborating with National Cancer Center Japan, University of Kyoto, and St Luke's International Hospital, focusing on discovery of new cancer biomarkers by advanced Mass Spectrometry. He has been awarded Princess Takamatsunomiya Cancer Research Award, as well as research grants from The Ministry of Education, Science, and Culture of Japan; United States Army Medical Research and Development Command; American Cancer Society; and National Institute of Health.

The Leading-edge Applications of Mass Spectrometry in the Drug Discovery and Diagnosis for Precision Medicine

Abstract

Driven by the development of high-end mass spectrometers, proteomic analysis is currently expanding its field beyond conventional quantitative analysis, as demonstrated in biomarker discovery studies, towards in-depth analysis of targeted molecules, such as single-cell imaging and characterization of heterogeneity in post-translational modification.

To illustrate this, the main topics of the present seminar include: (1) visualization of molecular abundance in biological specimens by mass spectrometry imaging (MSI); (2) high-sensitivity detection of diagnostic markers by Immuno-Beads MS technology; and (3) a brief introduction to the development of next-generation mass spectrometry system for contribution in drug discovery and diagnosis field.

We aim to integrate these novel technologies for tackling diseases (primarily cancer and neurodegenerative disease) in a comprehensive fashion; not only by detecting disease-specific biomarkers but also employing molecular imaging strategies for unraveling the molecular basis of pathology, determining the pharmacokinetics and validating the drug delivery system.

Keynote Speaker IV

Prof. Chien-Lung Chan

Department of Information Management, Yuan Ze University, Taiwan

Professor Chien-Lung Chan has been the full-time faculty in the Department of Information Management, Yuan Ze University, Taiwan since 1995. Currently, he is the Dean of College of Informatics and director of Innovation Center for Big Data and Digital Convergence. He has been teaching Statistics, Medical Informatics and Decision Support Systems after obtaining his Ph.D. degree in Industrial Engineering in 1995 from University of Wisconsin- Madison. In 2004, he assumed the responsibility as the Head of the Department of Information Management for a total of six years. In 2012, Professor Chan served as the Executive Director of Library and Information Services. Currently, he leads a research team cooperating with other medical institutes and focusing on “Big Data Analytics in Healthcare”. He has authored over 30 journal articles in the field of healthcare and medical informatics, information management, e-learning, and healthcare services research in recent five years. He received the Research Excellence Award from Yuan Ze University in 2013 and Y. Z. Hsu Outstanding Professor Award in August 2016

Big Data Analytics to Explore AMI Comorbidity with Air Pollutants and Risk of Readmission

Abstract

To investigate whether ambient air pollution were associated with increased risk of AMI (Acute myocardial infarction) readmission, we conducted Big Data Analytics and constructed predictive model by using data mining methods. The data come from the National Health Insurance Research Database (NHIRD) in Taiwan and Environmental Protection Department's "Environmental Statistics Database". The incidences of AMI were computed by obtaining patients' admission due to 1st AMI (ICD9-410). We also calculated the readmission incidences due to the same disease recurrence, i.e. 2nd AMI for MI patients within 30 days of patients' first event. We found important AMI readmission comorbidity factors including Hypertensive heart disease (OR = 3.249), Heart failure (OR = 1.551), Disorders of lipoid metabolism (OR = 1.423), Essential hypertension (OR = 1.312), Diabetes (OR = 1.258) and CCI (OR = 1.13). The air pollution exposure was analyzed on the readmission date, and 1 to 6 days before readmission. By age-stratified analysis, the readmission due to 2nd AMI collocation average value for 46~64-year-old patients is associated with PM2.5 and PM10 exposure. The AMI collocation peak value for 46~64-year-old patients is associated with PM2.5 and PM10.

Keywords: *Myocardial Infarction, Readmission, Air Pollution, Comorbidity, Big data Analytics*

Keynote Speaker V

Prof. Chung-Li Tseng

UNSW Business School, University of New South Wales in Sydney, Australia

Chung-Li Tseng is currently an associate professor of operations management at the UNSW Business School, University of New South Wales in Sydney, Australia. Prior to joining UNSW, he was on the faculty of the University of Maryland and the University of Missouri-Rolla in the US. He received his Ph.D. degree from the University of California-Berkeley and his M.S. from UC Davis. His research interests include operations management, energy management, healthcare service management, and business analytics. In healthcare, he has conducted research in m-health and recently behavioral compliance of healthcare workers. He has edited or co-edited several special issues of peer-reviewed journals. His published work has appeared in Operations Research, The Energy Journal, Energy Economics, European Journal of Operational Research, and other journals. He is a member of INFORMS and ASCE, and a senior member of IEEE. He is a past President of the Section on Energy, Natural Resources, and the Environment of the INFORMS. He is the Editor-in-Chief of the ASCE Journal of Energy Engineering (Impact Factor 1.94), and he has served on the Editorial Board of the ASCE Journal of Infrastructure Systems, the International Journal of Electronic Business Management, and the International Journal of Business Analytics.

Improving Hand Hygiene Process Compliance through Process Monitoring in Healthcare

Abstract

We study a compliance problem of healthcare workers (HCWs) in hospitals where hand hygiene compliance rates are generally low. In healthcare, low hand hygiene compliance of HCWs is the leading cause of hospital-acquired infections, which result in approximately 75,000 patient deaths per year in the US. Using a game-theoretical approach, we model HCWs' reactions to peers' (non-)compliance to determine their equilibrium compliance levels. We integrate the model with a disease-transmission model to determine how the compliance affects disease prevalence in a hospital ward. We establish that a macro-level hand hygiene compliance rate of HCWs can result from a combination of four different types of micro-level non-compliance: free-riding, safe-playing, self-regarding, and opportunistic behaviors. Finally, we show that the marginal effect of monitoring on reducing disease prevalence depends on clinical factors, HCWs' interpersonal learning, and other integration factors like goal setting. The results demonstrate that the monitoring intervention may not effectively prevent disease transmission without understanding the micro-level behaviors of non-compliant HCWs. Our results provide an explanation as to why there is a significant variability in the effectiveness of management intervention as observed in practice.

Keynote Speaker VI

Prof. Kiyoshi Hoshino
Tsukuba University, Japan

Prof. Kiyoshi Hoshino received two doctor's degrees; one in Medical Science in 1993, and the other in Engineering in 1996, from the University of Tokyo respectively. From 1993 to 1995, he was an assistant professor at Tokyo Medical and Dental University School of Medicine. From 1995 to 2002, he was an associate professor at University of the Ryukyus. From 2002, he was an associate professor at the Biological Cybernetics Lab of University of Tsukuba. He is now a professor. From 1998 to 2001, he was jointly appointed as a senior researcher of the PRESTO "Information and Human Activity" project of the Japan Science and Technology Agency (JST). From 2002 to 2005, he was a project leader of a SORST project of JST. His research interests include biomedical measurement and modelling, medical engineering, motion capture, computer vision, and humanoid robot design.

A New Method for High-accuracy Eye Movement Measurement

Abstract

This talk focuses on a new method for measuring user's eye movements day and night with a high degree of accuracy without imposing a psychological burden on a device-wearer, regardless of brightness of image contents. Specifically, our method, in particular, makes possible; (1) tracing the points where the user is looking at (i.e. line of sight); (2) detection of any of bad physical conditions, such as dizziness and sick-feeling, or the signs of them (i.e. nystagmus or cycloduction); and (3) estimation of the degree of distraction of attention (i.e. the degree of heterophoria between the eyes). In our system, a faint blue light with less brightness is illuminated in the vicinity of the eyeballs as an auxiliary light to improve the grayscale contrast of the blood vessels in the conjunctiva or sclera of an eyeball. Moreover, the above method is used together with a combination of techniques for equalizing the individual image partitions of the gray-level and for determining a banalization threshold based on the difference in grayscale value between the target and its adjacent pixels, so as to remove eyelashes and faint-colored thin blood vessels, achieving an improvement in grayscale contrast of the characteristic blood vessels. Furthermore, using a method for tracing the images of the characteristic template blood vessels is used to measure the user's eye movements.

Invited Speakers I

Prof. Michael T S Lee
Fu Jen Catholic University, Taiwan

Prof. Michael T S Lee received his Ph.D. in Operations Research and Industrial Engineering from the University of Texas at Austin in 1993. Currently, he is a professor and Vice President of International Affairs at the Fu Jen Catholic University in Taiwan. Previously, he served as the President of the International Association of Jesuit Business Schools (IAJBS). Also, he served as Dean of Fu Jen Catholic University's College of Management. Dr. Lee's research interests involve customer relationship management, machine learning, operations management, industrial engineering and management, applied statistics on big data, as well as marketing research. These involvements include the developments of novel statistical and bioinformatics methodologies for the analyses of healthcare service management and health economics. Dr. Lee's research has been published in Decision Support Systems, Computational Statistics & Data Analysis, Scientometrics, Obesity Surgery, and other internationally renowned journals. Coupled with his multiple editorial board positions in the aforesaid journals, Dr. Lee is the current Chief Editor of Journal of Data Science and a senior volunteer for the AACSB. Dr. Lee has been a peer review team (PRT) member for several AACSB accreditation visits and served as a prolific mentor for schools in the AACSB accreditation process. In the Greater China Region, Dr. Lee is the only facilitator of the AACSB business accreditation seminar. And since 2012, Dr. Lee has sat on the initial accreditation committee (IAC) of the AACSB.

Network Based Analysis of Medicine

Abstract

In previous medical research, diseases have usually been studied individually. While data are getting bigger and more complicated. Network can assist understanding the interconnections among covariates and samples. The pioneering human disease network (HDN) studies jointly consider a large number of diseases and provide a more comprehensive description of diseases. However, most of the existing HDN studies are based on molecular information and can only partially describe disease interconnections. Our study adopted clinical data from Taiwan to construct an epidemiological Human Disease Network (eHDN). Important network properties such as connectivity, module, hub, and others were examined. Much useful information is contained in the network structure. Also, such information is applied for research on detailed disease comorbidity.

Invited Speakers II

Prof. Yen-Wei Chu
National Chung Hsing University, Taiwan

Yen-Wei Chu is an associate professor of Institute of Genomics and Bioinformatics and the joint appointment professor of Institute of Molecular Biology and Graduate Institute of Biotechnology at National Chung Hsing University, Taiwan. He received his Ph.D. degree in Computer Science in 2006 from the National Chiao Tung University, Taiwan. His lab takes the technologies of data mining, machine learning and artificial intelligence as the core algorithms. To establish a variety of intelligent decision-making systems for different issues, which is the important part for industry 4.0 and internet of things. He mainly focus on building the learning model of humanoid intelligence, covering the field of bioinformatics, medical science, agriculture, food science, business, astronomy and so on.

Predicting Human Protein Subcellular Localization by Heterogeneous and Comprehensive Approaches

Abstract

Drug development and investigation of protein function both require an understanding of protein subcellular localization. We developed a system, REALoc that can predict the subcellular localization of singleplex and multiplex proteins in humans. This system, based on comprehensive strategy, consists of two heterogeneous systematic frameworks that integrate one-to-one and many-to-many machine learning methods and use sequence-based features, including amino acid composition, surface accessibility, weighted sign aa index, and sequence similarity profile, as well as gene ontology function-based features. REALoc can be used to predict localization to six subcellular compartments (cell membrane, cytoplasm, endoplasmic reticulum/Golgi, mitochondrion, nucleus, and extracellular). REALoc yielded a 75.3% absolute true success rate during five-fold cross-validation and a 57.1% absolute true success rate in an independent database test, which was >10% higher than four other prediction systems. Lastly, we analyzed the effects of Vote and GANN models on singleplex and multiplex localization prediction efficacy. REALoc is freely available at http://predictor.nchu.edu.tw/REALoc.

Invited Speaker III

Prof. Ayako Okuyama
National Cancer Centre, Japan

Ayako Okuyama obtained her bachelor's degree from Osaka University in 2001 and worked as a nurse at the University Hospital for 2 years. She conducted research on patient safety and received her master's degree in Health Science from the University of Tokyo in 2007. Upon working as an assistant professor at Osaka University, she became a researcher at Alkmaar Medical Centre and VU University Medical Centre in the Netherlands in 2008. After returning to Japan in 2012, she worked at the University of Tokyo as an assistant professor. She got a doctoral degree from Osaka University (PhD of Health Science). She is currently a researcher at the National Cancer Centre in Japan.

Simulation Study for Assessing the Impact of Incomplete Registration of Deaths

Abstract

Estimates of cancer survival constitute important information for developing cancer control plan. Hakulinen et al. shows the validity of survival rate depends on completeness of ascertainment of deaths in the cancer registries. This study measures the impact on ascertainment of deaths when completeness varies with individual characteristics.

Data from the hospital-based cancer registries of 177 designated cancer care hospitals throughout Japan were used. Our analysis considered patients diagnosed with one of five major cancers (stomach, colon, liver, lung, breast) in 2007. Aged 15 years old or older at diagnosis were included. Before starting simulation, we assessed whether differences in follow-up rates by individual characteristics, such as age and sex. Then, we simulated under-ascertainment of deaths through linkage failure of registry data with resident cards (these include information whether patients are alive or not) with probabilities between 1% and 5%. The expected impact on estimates of 5 year absolute survival was assessed.

In our sample, the young (15-39 year old group) and very old patients groups (over 85 years old group) have lower follow-up rates. Overestimation of survival increases with the degree of record linkage failure. These potential errors are much larger for older patients with poor prognosis cancers (differences in liver 2.1%, and in lung 2.0%), compared with good survival rate (differences in female breast 0.4%). These results suggests survival rates for liver cancer in Japanese patients are overestimated by 2.1 percentage points (estimated survival range: 31.6-33.7%) due to loss to follow-up, if the assumptions we make are reasonable.

One would expect overestimation of survival to be negligible with linkage failure of only 1% of deaths. However, with 5% linkage failure, the expected overestimation is greater. It is important to achieve 100% completeness in registration of deaths for estimating survival using cancer registries. When we cannot achieve such completeness, we should interpret survival with caution, particularly, survival for older patients.

Invited Speaker IV

Prof. Yuri Ito
Osaka International Cancer Institute, Japan

Yuri Ito is the senior researcher at Osaka Cancer Registry in Japan. She received her MSc and PhD in Health Science from Osaka University. She currently works in cancer control in Osaka, and Japan. Her research is based on the descriptive epidemiology in cancer using the cancer registry and other official statistics data for policy making and evaluation. Recently, she is also interested in the socioeconomic inequality in cancer in Japan.

Socioeconomic Inequalities in Cancer in Japan

Abstract

During the long-term economic recession of Japanese economy, health inequalities have appeared in Japan. It is important to monitor the trends in health inequalities using routinely collected official statistics.

To monitor the deprivation gap in mortality, incidence and survival for cancer, we used the areal deprivation index (ADI) to determine socio-economic status based on the census-based information by residential area. For incidence and survival, we used the population-based cancer registry data in Osaka, for mortality, we used the vital statistics database in Japan.

Incidence rates of all late-stage cancers were higher in more deprived groups, except for prostate cancer. Contrary, early-stage incidence rates of prostate, stomach and colorectal cancers in less deprived males were higher than those in the more deprived.

A wide deprivation gap in survival was observed in most of the adult, solid, malignant tumours, within the universal healthcare system in Japan.

Wider gaps in cancer mortality between the most and the least deprived in men were observed than those in women. Deprivation gaps were wide in Liver, Lung, Cervical cancers and Leukaemia, while inverse contrast was observed in Breast, Corpus uteri and Ovarian cancer.

We observed socioeconomic inequalities in all cancer outcome in Japan. We need further investigation about the mechanism of the gap related to early detection, and cancer care, in order to take measure to reduce the gap effectively.

Schedule of Tsukuba Conference

June 08, 2018 Friday		
13:00-17:00	**Arrival Registration**	Laboratory for Advanced Research B Room 0108
June 09, 2018 Saturday Arrival Registration, Keynote Speech and Conference Presentation		
8:30-17:00	**Arrival Registration**	Laboratory for Advanced Research B Room 0110
09:00-09:10	**Opening Ceremony**	Laboratory for Advanced Research B Room 0110
09:10-09:40	**Keynote Speech I** Prof. Reinhold Haux University of Braunschweig - Institute of Technology and Hannover Medical School, Germany	Laboratory for Advanced Research B Room 0110
09:40-10:10	**Keynote Speech II** Prof. Tetsuya Sakurai Director of Center for Artificial Intelligence Research (C-AIR) at the University of Tsukuba, Japan	Laboratory for Advanced Research B Room 0110
10:10-10:30	Coffee Break & Group Photo	1F Hallway

<table>
<tr><td>10:30-11:00</td><td colspan="2">Keynote Speech III
Prof. Taka-Aki Sato
Director of R&D Center for Precision Medicine in University of Tsukuba, Japan</td><td>Laboratory for Advanced Research B Room 0110</td></tr>
<tr><td>11:00-11:30</td><td colspan="2">Keynote Speech IV
Prof. Chien-Lung Chan
Department of Information Management, Yuan Ze University, Taiwan</td><td>Laboratory for Advanced Research B Room 0110</td></tr>
<tr><td>11:30-12:00</td><td colspan="2">Keynote Speech V
Prof. Chung-Li Tseng
UNSW Business School, University of New South Wales in Sydney, Australia</td><td>Laboratory for Advanced Research B Room 0110</td></tr>
<tr><td>12:00-12:30</td><td colspan="2">Keynote Speech VI
Prof. Kiyoshi Hoshino
Tsukuba University, Japan</td><td>Laboratory for Advanced Research B Room 0110</td></tr>
<tr><td>12:30-14:00</td><td colspan="2">Lunch Break</td><td>Lunch Box</td></tr>
<tr><td rowspan="4">13:10-14:00</td><td colspan="2">Student Easy Competition Session</td><td></td></tr>
<tr><td colspan="2">STD Competition Session 1: PhD Group</td><td>Laboratory for Advanced Research B Room 0911-1</td></tr>
<tr><td colspan="2">STD Competition Session 2: Master Group</td><td>Laboratory for Advanced Research B Room 0911-2</td></tr>
<tr><td colspan="2">STD Competition Session 3: Undergraduate Group</td><td>Laboratory for Advanced Research B Room 0913</td></tr>
<tr><td rowspan="2">14:10-14:50</td><td colspan="2">Invited Speech Session I</td><td rowspan="2">Laboratory for Advanced Research B Room 0110</td></tr>
<tr><td>Invite speech 1 (14:10-14:30)
Prof. Michael T S Lee
Fu Jen Catholic University, Taiwan</td><td>Invite speech 2 (14:30-14:50)
Prof. Yen-Wei Chu
National Chung Hsing University, Taiwan</td></tr>
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<table>
<tr><td rowspan="2">14:10-14:50</td><td colspan="2">Invited Speech Session II</td><td rowspan="2">Laboratory for
Advanced Research B
Room 0112</td></tr>
<tr><td>Invite speech 3 (14:10-14:30)
Prof. Ayako Okuyama
National Cancer Centre, Japan</td><td>Invite speech 4 (14:30-14:50)
Prof. Yuri Ito
Osaka International Cancer Institute, Japan</td></tr>
<tr><td colspan="4">Sub-Sessions (in Parallel)</td></tr>
<tr><td rowspan="7">15:00-16:00</td><td colspan="2">Special Session: Medical and Healthcare System Technology</td><td>Laboratory for
Advanced Research B
Room 0107</td></tr>
<tr><td colspan="2">Special Session: Social Sciences and Public Health</td><td>Laboratory for
Advanced Research B
Room 0108</td></tr>
<tr><td colspan="2">Special Session: Information Technology in Health Education</td><td>Laboratory for
Advanced Research B
Room 0112</td></tr>
<tr><td colspan="2">Special Session: Medical Care, Social Participation and Workforce of Long Term Care</td><td>Laboratory for
Advanced Research B
Room 0911-1</td></tr>
<tr><td colspan="2">Special Session: Health and Biomedical Informatics</td><td>Laboratory for
Advanced Research B
Room 0911-2</td></tr>
<tr><td colspan="2">Session: Health Service Management</td><td>Laboratory for
Advanced Research B
Room 0913</td></tr>
<tr><td colspan="2">Session: Biomedical Data mining</td><td>Laboratory for
Advanced Research B
Room 1001</td></tr>
</table>

	Session: mHealth Apps	Laboratory for Advanced Research B Room 1014
16:00-16:20	Coffee Break	1F Hallway
Sub-Session (in Parallel)		
16:20-18:00	**Session: Electronic Health Records**	Laboratory for Advanced Research B Room 0107
	Session: Healthcare Quality Management	Laboratory for Advanced Research B Room 0108
	Session: Health Policy and Management	Laboratory for Advanced Research B Room 0112
	Special Session: Value Co-Creation of Emerging ICT Technologies and Healthcare Service Management-Innovating the Future	Laboratory for Advanced Research B Room 911-1
	Special Session: Healthcare Management and Expenditure Analysis	Laboratory for Advanced Research B Room 911-2
	Special Session: Medical and Healthcare System Technology	Laboratory for Advanced Research B Room 913
	Session: Medical Image Processing & Special Session: User Experience Based Service Innovation in Healthcare Management	Laboratory for Advanced Research B Room 1001

	Special Session: Complementary and Integrative Medicine in Health Care System **&** **Special Session: Intelligent Systems and Applications for Clinical and Patient Information**	Laboratory for Advanced Research B Room 1014
18:00-18:20	Closing Ceremony	Laboratory for Advanced Research B Room 0112
19:00-20:30	Dinner	Edo-mae Sushi (Transportation will be provided)
June 10, 2018 Sunday		
9:00-17:00	One Day Tour	Tsukuba

LET'S MOVE TO THE DETAIL SCHEDULES!

Student Essay Competition

STD Competition Session 1: PhD Group

Session judge: Prof. Chien-Lung Chan, Prof. Yang Xu, Dr. Chalong Cheewakriangkrai
Venue: Laboratory for Advanced Research B
Room 0911-1
Time: 13:10-14:00

Note:

*** Each presentation should be 10 mins oral pretention + 2 mins Q&A.**

*** There are 3 groups of students, phd students, master students and undergraduate students, each student will compete in their group. One best essay will be selected from each group by the judges based on the quality of his/her essay and the performance of his/her oral presentation.**

*** The certifications of the best oral presentations will be awarded at the end of the conference at the closing ceremony.**

SS04-04 (13:10-13:22)	Case Based Reasoning Driven Ontological Intelligent Health Projection System Chuan-Jun Su, **Shi-Feng Huang** and Yi Li Yuan Ze University, Taiwan Abstract--- For the past few years, health-related issues are getting more and more attention. With regular health screening, disease detection and subsequent medical attention can proceed with far lesser chance of missing the critical period. The projection of health related issues from health screening has been studied by using statistical analysis methods. However, the results generally fail to alert the subjects regarding the potential risks involved due to lack of certainty. The potential health issues derived from statistical analysis of health screening data and medical general guidelines can only be presented to the subjects with probability and lack of supportive hard evidence. The efficacy of health screening consequently fails to be realized. In order to confront the dilemma, we have developed an Intelligent Health Projection System (IHPS) for providing an evidential health status projection and a more motivated health plan to the subjects. This study focuses on modelling Type 2 Diabetes Mellitus (T2DM) and associated factors as an example. Other cases can be analogously implemented. The IHPS adaptively provides the projection of potential risk of getting T2DM by exploring the similarity between the subject's health screening data and previous T2DM patients' cases. The main building blocks, the cases that serve as a knowledge base for IHPS are modelled using ontology technology. As the main functionality of IHPS, the T2DM projection uses the traces left by previous T2DM patients and works on top of case-based reasoning mechanism. The proposed IHPS aims to promote better self-health management by enhancing a subject's comprehension on risks revealed in health screening result. The cases retrieved can not only being used for risk projection of a subject but also serving as evidences for physicians to provide more accurate and convincing health advice.

SS10-02 (13:22-13:34)	Impact of Temperature Variability on the Incidence of Acute Cardiovascular Disease in North Taiwan Tian-Shyug Lee, **Ming Gu**, Ming-Chih Chen, Chi-Jie Lu, Chih-Te Yang and Chien-Chih Wang Fu Jen Catholic University, Taiwan Abstract--- The purpose of this study was to determine whether ambient temperature changes were associated with incidence of acute cardiovascular disease among persons who lived in North Taiwan. We made use of distributed lag non-linear models, constrained to a 20 days lag period, simultaneously adjusted for several temporal trends, to quantify the attribution risk burden attributable to non-optimum ambient temperature. Current evidence on connection between temperature variability and incidence of acute cardiovascular disease were limited. This study attempted to fill this knowledge gap. By our study, we found that both hot and cold weather in North Taiwan were associated with increase in daily incidence of acute cardiovascular disease. And both extreme cold and hot temperatures more significantly increased the risk of incidence. Cold effects persisted for 10 days, while heat effects were more immediate. The effects from heat persisted for about the recent 2 days. And cold weather was associated with increased risk at lags 2–10 days. This study showed that exposure to both hot and cold temperatures was associated with increased incidence of acute cardiovascular disease in North Taiwan. Our findings may have implications for developing intervention strategies for extreme cold and hot temperatures.
SS10-05 (13:34-13:46)	Analysis the Influencing Factor in Hospitalization Expenditures for Heart Failure Patient with Different Hospital Levels Tian-Shyug Lee, Ming-Chih Chen, **Yen-Chun Huang** and Kuan-Yu Chen Fu Jen Catholic university,Taiwan Abstract--- Patients with Heart Failure (HF) for hospitalization who has the risk of subsequent mortality and also increase the medical costs. We analyzed data from the Taiwan National Health Insurance Research Database (NHIRD) one of the largest administrative health care databases around the world, has been used widely in academic studies. In the previous studies, The time you spend more in-hospital, the risk of death will also increase, especially undergoing surgery. The research of different hospital institutions and medical expenses is quite less, so we use NHIRD to find out the reason of increasing medical cost, and through this studies under the government-level medical plan, we can provide a good choice for medical treatment of patients.

Student Essay Competition

STD Competition Session 2: Master Group

Session judge: Prof. Hsi-Chieh Lee, Prof. Leyi Wei, Prof. Xiucai Ye
Venue: Laboratory for Advanced Research B
Room 0911-2
Time: 13:10-14:00

Note:

*** Each presentation should be 10 mins oral pretention + 2 mins Q&A.**

*** There are 3 groups of students, phd students, master students and undergraduate students, each student will compete in their group. One best essay will be selected from each group by the judges based on the quality of his/her essay and the performance of his/her oral presentation.**

*** The certifications of the best oral presentations will be awarded at the end of the conference at the closing ceremony.**

I0050 (13:10-13:22)	An Embedding-Based Approach for Oral Disease Diagnosis Prediction from Electronic Medical Records **Guangkai Li**, Songmao Zhang, Jie Liang, Zhanqiang Cao and Chuanbin Guo University of Chinese Academy of Sciences, China Abstract---This paper reports a diagnosis prediction study from electronic medical records (EMRs) of oral diseases. We propose to learn continuous vector representations (embeddings) of symptoms and diagnoses through training neural networks. To the best of our knowledge, this is the first attempt to apply word embedding to predicting diagnoses from stomatologic EMR data. Evaluations on real-world EMR datasets from eleven departments in Peking University School and Hospital Stomatology demonstrate that our model has produced promising results in diagnosis prediction. Compared with classic machine learning algorithms, our model captures the correlation between symptoms and diagnoses, which leads to the best performance in terms of accuracy, precision, recall, F-score, and Cohen's kappa statistic. Visualizations illustrate the quality of the symptom and diagnosis embeddings generated by our approach
I0156 (13:22-13:34)	SlimMe: a Virtual Diet Assistant Based on Conversational Artificial Intelligence for Personal Weight Loss Management **Annisa Ristya Rahmanti** and Yu-Chuan (Jack) Li Taipei Medical University, Da'an Campus, Taiwan Abstract--- As the prevalence of obesity continues to rise annually throughout the world, effective strategies to achieve beneficial weight loss are still become a great challenge.

	Working face to face with a professional dietitian is believed to be one of the biggest drivers for an effective weight management program. However, human dietitians lack of time to offer extensive support to monitor as well as motivate their client. Recently, the emergence of conversational artificial intelligence or chatbot supported with the rapid spread of messaging platform and mobile technology provide the opportunity for helping dietitian providing 24-hour interactive personalized feedback and responsive empathy to their clients during their long-term weight management goal. This study aimed to design a framework of an interactive virtual diet assistant for personal weight loss management based on conversational artificial intelligence, which we called "slimMe."
M0022 (13:34-13:46)	Feature Extraction for Photoplethysmographic Signals using PWA: PPG Waveform Analyzer **Pourush Sood**, Shibabroto Banerjee, Prof. Sujoy Ghose, Prof. Partha Pratim Das Indian Institute of Technology Kharagpur, India Abstract—n this paper we propose algorithms to identify some of the features and patterns present in Photoplethysmographic (PPG) signals for example, dichrotic notches, ectopic beats and apertures, and various techniques for extracting these features are suggested. We have also developed and tested a software, PWA (PPG Waveform Analyzer) to detect and analyze the features of the PPG Signal and generate a report containing the statistical information about the signal. The PPG data has been collected from 35 subjects using a Pulse Oximeter having USB interface and connected to a computer. The software can aid medical practitioners to identify and visualize patterns in a PPG signal and also organize them along with the statistical information, and generate a comprehensive report of a PPG signal. We achieved a high accuracy in detecting these features when compared to manual analysis.

Student Essay Competition

STD Competition Session 3: Undergrads Group

Session judge: Prof. Yen-Chiao (Angel) Lu, Dr. Wen-Chien Ting, Dr. Tse-Hung Huang
Venue: Laboratory for Advanced Research B
Room 0913
Time: 13:10-14:00

Note:

*** Each presentation should be 10 mins oral pretention + 2 mins Q&A.**

*** There are 3 groups of students, phd students, master students and undergraduate students, each student will compete in their group. One best essay will be selected from each group by the judges based on the quality of his/her essay and the performance of his/her oral presentation.**

*** The certifications of the best oral presentations will be awarded at the end of the conference at the closing ceremony.**

I0035 (13:10-13:22)	Development of CERIA: A Mobile Application to Support Community-empowered Dementia Prevention Program in Indonesia **Muhammad Aji Muharrom** and Hera Afidjati Universitas Indonesia, Indonesia Abstract--- Dementia is neurodegenerative disease that is predicted to double in the next 15 years and causes adverse socioeconomic effects. Until now, clinical therapy of dementia has not shown satisfactory results. Hence, we need a preventive effort involving the active role of the elderly and supported by the development of information technology. We developed CERIA, a community-empowerment intervention as a preventive measure of dementia among elderly. CERIA was a pilot project implemented to 33 elderly in Kebagusan District, Jakarta, Indonesia. We built our own mobile application to support implementation of this program. CERIA mobile application is intended to be used by community health workers (CHWs) to assist them in running this program. This mobile application was developed mainly to assist CHW in assessing elderly participants using ABCDE (A: daily activity using Katz Index, B: balance with Romberg Test, C: cognitive using MMSE, D: disability & disease, E: emotion using Geriatric Depression Scale) instrument. We measure pre- and post-intervention score of the elderly using this assessment tool. CERIA mobile application is the first mobile health (mHealth) initiative focusing on dementia prevention program in Indonesia. Deployment of such mHealth initiative helps to improve accuracy and data quality for surveillance purposes, particularly in low-resource developing country such as Indonesia. It may also improve efficiency and healthcare delivery while reducing cost. As the first mHealth initiative on dementia prevention in Indonesia, this program has a strong

	potential to be implemented in a wider scope. We hope this mHealth implementation could pioneer the advent of other mHealth tools accustomed to assist CHW in low-resource environment. Further improvement involving parties such as Ministry of Health is needed to replicate this effort.
SS08-04 (13:22-13:34)	Adapting an Evidence-based Diagnostic Model for Predicting Recurrence Risk Factors of Oral Cancer Chi-Chang Chang, Shin Yang Chen,Yi-Chen Chung, **Yi-Ling Huang** Chung Shan Medical University, Taiwan Abstract --- The relationship between prognosis and oral cancer has been extensively investigated, yet its impact on recurrence and oral cancer patients has not been well studied. The early prediction of recurrence has become a necessity in cancer research. The objective of this study is to propose an evidence-based diagnostic model with machine learning techniques for the prediction of risk factors of recurrent oral cancer. The proposed model was the combination of rules and four machine learning techniques (K-Nearest Neighbour IBK, KSTAR, RandonizableFilteredClassifier and RandomTree). Additionally, the performance of each technique was evaluated with accuracy, sensitivity, specificity, Fallout, F1 score and MCC. We use a dataset with 20 attributes that include the records of 1,428 patients. The result of pre-screenings, KSTAR technique showed best performance in comparison to other techniques. The accuracy, sensitivity, specificity, Fallout, F1 score and MCC were 72.73%, 71.60%, 72.69%, 27.04%, 70.31%, 43.34%, respectively. Five out of 20 screening variables are eliminated. After screening, KSTAR techniques showed the larger accuracy (77.04%), sensitivity (77.98%), specificity (75.48%), Fallout (36.62%), F1 score (81.17%) and MCC (50.54%). Further, surgical margins, pathologic stage, behaviour code, lifestyle factors (smoking and betel nut chewing) are the important risk factors for predicting recurrence of oral cancer. Finally, this proposed diagnostic model is recommended as a decision assist tool for recurrent oral cancer prediction and can be used by clinicians as well as clinical decision making.
SS03-03 (13:34-13:46)	Data Mining for Enhanced Filtration Rate of Kidney Sliver in Chinese and Western Medicine Kuo-Yi Lin and **Yu-Hsuan Liu** Asia University, Taiwan Abstract--- In recent years, the usage of Traditional Chinese drug has combined to Western drug in the medical treatment. Based on general conception, traditional Chinese medicine is more focused on patients' holistic physical condition, which gradually works up to getting the balance of whole body. However, efficacy of Western medicine is faster and more effective than traditional Chinese with more side effects. Moreover, the overpopulation, the

	proliferation of civilized diseases and other issues will be needed to take in long-term care, such as observation and prediction of the reactions after treatment. It can be combined with the clinical diagnosis and development of specific therapies. As a consequence, this research is more significant to change for the future of medical model. The main purpose of this research is to analyze the combined effect of Chinese and Western drugs on human renal function that we can find out for the delay in the deterioration of renal function with using the medicine. In addition, we hope that it could restore renal function while the physicians will take a prescription for patients in the future, in order to provide the more favorable relevant reference data and reduce less side-effect treatment for patients. This research adopted Chinese and Western medicine in a teaching hospital of the certain area in Taiwan. Based on the combination of medical records database, we discussed the relationship between Glomerular Filtration Rate (GFR). With using the data mining approach, we search for the treatment time, the related diseases, the way of using medications, and the rules of changing the Filtration Rate of the kidney silk ball. Adopting the above cases, we can find and analyze the most adequate combination of Chinese and Western drugs due to the diversity of patients' individual needs.

Detail Schedule for Sub-Sessions (in Parallel)

Special Session < Medical and Healthcare System Technology >

Session Chair: Prof. Tian-Fu Lee
Venue: Laboratory for Advanced Research B, Room 0107
Time: 15:00-16:00

Note:

*** Each presentation should be 10mins oral pretention + 2 mins Q&A.**

*** The certification of the best oral presentation will be awarded at the end of the conference at the closing ceremony.**

***To show the respect to other authors, especially to encourage the student authors, we strongly suggest you attend the whole session, the scheduled time for presentations might be changed due to unexpected situations, please come as early as you could.**

SS01-01 (15:00-15:12)	Glucose Level Detection in Vitro Based on Fourier Transform of Photoacoustic Imaging Signals **Tsu-Wang Shen**, Hemalatha Mani, Yuwei Zhan and Jen-Hung Yang Tzu Chi University, Taiwan Abstract--- In recent years, photoacoustic (PA) imaging technology has been developed rapidly because of no risk on radiation exposure with high image resolutions. This study aims to analysis the quality effects of photo-acoustic imaging. The laser beam of 650nm is applied over various mediums and echoed back ultrasound signals are analyzed. A maze phantom is used as a surface medium for image pattern reconstruction; also experiments were done with water, red ink, hemoglobin, saline solution and different percentages of glucose concentration which mimic the relative glucose concentration within human body. The data were retrieved by the custom-made software from the piezoelectric sensor at various time intervals. By using Fast Fourier Transform (FFT) method, the features extracted from echo waves were found the significance among samples.
SS01-02 (15:12-15:24)	Using a Cross-Validation Approach on Multiple Microarrays to Analyze Significant Genes in Colorectal Cancer Hendrick, **Liang-Tsung Huang**, Ching-Sheng Hsu and Jiann-I Pan Department of Medical Informatics, Tzu Chi University Abstract--- Microarray is one of general approaches to the cancer analysis from the molecular level. The highly accurate cancer prediction derived from microarray data is based on the selected genes as well as the number of genes. However, the experiments may be performed on various specifications of microarray chips in practice. In this study, we used a cross-validation approach on three different types of Affymetrix microarray chips:

	HG-U133-Plus-2, HG-U133A and HG-U219, to examine which genes are significant and how many genes is effective for the colorectal cancer (CRC) classification. Firstly, microarray datasets of colorectal cancer were retrieved from NCBI GEO database. The datasets based on different types of microarray chips were then analyzed by linear models and support vector machines as the gene selection and the cancer classification, respectively. The results showed that CLCA4 exists on the significant gene sets of all three datasets, indicating a major significant impact. Further, the gene set of FOXQ1, GCG, CLDN8, MS4A12 and CLCA4 may be closely associated with colorectal cancer since these genes give relatively high accuracy on all three datasets. Moreover, the genes were validated by Colon Rectal Cancer Gene (CoReCG) Database which gives existing evidences of published literatures for the genes in colorectal cancer. The cross-validation approach combines multiple microarrays with the literature database and therefore provides more clues about the significant genes in microarray analysis.
SS01-03 (15:24-15:36)	Applying Data Mining and Fuzzy Logic Techniques to Analyze a Medical Examination Database Chien-Ting Chen, **Jenn-Long Liu** and Yun-Yun Chang I-Shou University, Taiwan Abstract--- In recent years, the aging population is growing much faster than the total population in Taiwan. This change in the population structure on age has shifted Taiwan gradually to an aged society. As a result, elderly people increasingly concern about their health such that they take physical examinations regularly. Accordingly, this work focuses on the study of analyzing a medical examination database by using data mining and fuzzy logic techniques. The medical examination database, conducted by Nutrition and Health Survey in Taiwan from 2004 to 2008, is used by adopting 1,843 from 3,671 samples, excluding 1,827 ones with missing data, for the data mining and attribute analysis. Among the available samples, the confirmed cases with cardiovascular disease (CVD) are used and analyzed using classifiers with C4.5, NB tree, Naïve Bayes, Bayes Net, and Multi-Layer Perceptron, respectively. Experiments indicated that the result of a patient with hypertension, hyperlipidemia, stroke, and heart diseases is a reasonable combination to diagnose him or her as suffering from CVD or not. The accuracy of classification for the training set is 81% obtained using C4.5. Furthermore, this study adopts a fuzzy inference system with giving some significant attributes selected from the attribute analysis and healthcare knowledge. The significant attributes include five physiological indexes obtained from physical examination items and also three lifestyle factors. The eight crisp inputs of the significant attributes are selected from the medical examination database and then input into the fuzzy inference system to assess the risk of a patient suffering from CVD. The analyzed results using proposed data mining and fuzzy logic techniques for the medical examination database are shown to be good references for patients' self-health management and physician's disease diagnosis.

SS01-04 (15:36-15:48)	Enhanced Chaotic Map-based Authenticated Key Agreement with Privacy Protection for Multi-receiver Environment **I-Pin Chang** University of Kang Ning, Taiwan Abstract--- Multi-receiver encryption is an important cryptographic paradigm that enables flexible, on-demand and low-cost computing to securely deliver a message over an insecure network. Authenticated key agreements for multi-receiver enable a group of receivers to authenticate each other and to establish a common key for securely communicating over public networks. In 2017, Sun et al. presents an chaotic map-based authenticated key agreement for muti-receiver environment, named MRCM which uses chaotic maps for mutual authentication and privacy protection. However, this study analyzes the weaknesses of the key agreement scheme of Sun et al., which include suffering from impersonation attacks and modification attack, violation the session key security, and failure to protect users privacy. An enhanced chaotic map-based authenticated key agreement scheme based the scheme of Sun et al. is proposed for multi-receiver environment. Compared with related schemes, the enhanced scheme solves the weaknesses in previous approaches, increases security requirements and has lower computational cost.
SS01-05 (15:48-16:00)	An Improved Authenticated Key Agreement protocol with Privacy Protection for Mobile Healthcare Systems with Wearable Sensors **Tian-Fu Lee**, Yin-Yu Diao and Meriske F. Chen Tzu Chi University, Taiwan Abstract--- Authenticated key agreement schemes for mobile healthcare systems with wearable sensors enables patients' wearable devices, the mobile terminal, healthcare staff and the healthcare service to authenticate each other and establish a secure communication channel. Recently, Li et al. proposed an authenticated key agreement scheme based on elliptic curve cryptography for mobile healthcare systems with wearable sensors. Although the scheme of Li et al. provides a complete solution for providing healthcare staff, wearable sensors, mobile users, controller nodes and the healthcare service provider with authentication and key agreement, their scheme still fails to realize mutual authentication, user privacy protection, perfect forward secrecy. This investigation discusses these limitations and presents an improved protocol based on the scheme of Li et al. The improved protocol not only avoids the limitations in previous approaches, but also increases the efficiency in computation.

Special Session < Social Sciences and Public Health >

Session Chair: Prof. Hsu-Ju Teng
Venue: Laboratory for Advanced Research B, Room 0108
Time: 15:00-16:00

Note:

*** Each presentation should be 10mins oral pretention + 2 mins Q&A.**

*** The certification of the best oral presentation will be awarded at the end of the conference at the closing ceremony.**

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SS02-01 (15:00-15:12)	The Cognitive Difference of Complementary and Alternative Medicine among Physician-Patients Relationships **Yu-Ju Chou**, Yen-Hung Yeh and Hsin-Yi Chang Department of Health Diet and Industry Management, Chung Shan Medical University, Taiwan Abstract---Current studies revealed that Complementary and Alternative Medicine (CAM) is a common medical care therapy for cancer patients, however, it might cause some potential risk during the treatment period. Prior researchers have pointed the lack of interaction and conversation between physician and patients, and this also resulted in some medical ethical and security issue. This study aims to investigate the cognitive difference of CAM among Physician- Patients. Questionnaires were adopted to analyze the usage experience on four different groups (doctors, medical personnel, cancer supporter and patients), total 145 samples. Semi-structural interview was also used to have a further understanding their cognitions and interaction experience on CAM among these four groups. Results indicate that 37% patients have not discussed CAM with physicians, and there is a significant cognitive difference between patients and physicians due to lack of CAM communication. This study suggests that physicians should actively discuss this issue with patients to build the
SS02-03 (15:12-15:24)	The Effect of Perceived Crowding to Customer Dysfunctional Customer Behavior: Negative Emotion and Anticipated Regret as Mediator **Sih-Sian Yu**, Jia-Jen Ni and Chi-Feng Lo Department of Health Diet and Industry Management, Chung Shan Medical University, Taiwan Abstract--- This research investigates whether perceived crowding influence dysfunctional

	customer behavior, and whether negative emotion and anticipated regret would mediate this relationship. To test these relationship, the present study use data from 399 samples from different kinds of service situations. The results of the structural equation analysis reveal that most of these hypotheses are supported. This result can clarify the relationship which factors would impact the dysfunctional customer behavior. The service managers can control the servicescape and situation variables that relate to dysfunctional customer behavior. Future research might investigate the other factors that would induce the dysfunctional customer behavior, then reduce the severity and frequency of dysfunctional customer behavior.
SS02-04 (15:24-15:36)	The Relationship between Workplace Friendship and Work Engagement **Chi-Feng Lo** and Churn-Yu Chen Chung-Shan Medical University, Taiwan Abstract--- Although researchers and managers have recognized the importance of work engagement in the management field, many questions remain unanswered. This study fills gaps in the area of work engagement by considering the relationship between workplace friendship and work engagement. Based on data obtained from 370 employees in Taiwan, we show that workplace friendship is positively associated with work engagement. Compared with traditional job resources, the development of workplace friendship among employees is an alternative feasible job resource for increasing work engagement.
SS02-06 (15:36-15:48)	Can Sugar Labeling Reduce Sugar-Sweetened Beverages Purchase intention? A perspective from TPB model Hsin-Hui Lee, **Hsu-Ju Teng** and Han-Shen Chen Department of Health Diet and Industry Management, Chung Shan Medical University, Taiwan Abstract--- By including the TPB model, this study provides a more comprehensive understanding of how consumer psychological react the sugar labeling on sugar-sweetened beverages (SSBs) and explore the effects of sugar labeling on the intention to purchase SSBs. The 3x2x2 experimental designs was conducted on a sample of 480 Taiwanese students to investigate whether consumers' attitude, subject norm and perceived behavioral control affects consumer's purchase intention on SSBs. Our results revealed that when label disclosure was high, the participants had higher purchase intention. Furthermore, purchase intention was at its lowest when the label disclosure was low and no warning statement was given, but at its highest when the label disclosure was high and no warning statement was given. The results also stated that when label disclosure was high, the curve became an inverted U-shape, and perceived behavioral, and attitude control

	was at its highest when the level of concrete information was medium. The present study incorporated concrete information, label disclosure, and warning statements and investigated their effects on the intention to purchase SSBs. The applicability of the theoretical findings regarding organic food products in research on SSBs was also examined. From the TPB perspective, this study proposes that label disclosure would be the most effective strategy to influence SSBs purchase intention, with the interaction of warning statement and label disclosure, it could also lower the SSBs consumption intention.
SS02-07 (15:48-16:00)	Explore the Factors that Consumers Have for Queuing Food Behavior - Taking Taichung University Students as an Example **Hung-Chih Hsu** and Kuan-Lin Yeh Department of Health Diet and Industry Management, Chung Shan Medical University, Taiwan Abstract--- In Taiwan, most of the consumers have waited in line.Even though Waiting in line usually let people lost patience. When many people line up in front of the store can lure consumers to line up among the ranks of consumers. Consumers are willing to spend time and money to wait in line for commodities, because the commodities have a great attraction for consumers. In many of commodities, the food can make both young and old people come to line up.There are about three reasons cause customers buying somethings. First, they might be attracted by the brand awareness. Second, they might want to show off that they've already tried the products. Third, they might be curious about the new products.According to the past studies, people would have two kinds of behaviors of starting doing something. One is having a complete plan before doing; another is doing it without thinking.However, lining up for food hasn't been clarified in impulsive behaviors or planned behaviors. Therefore, I want to discuss this kind of behaviors and get the result whether is part of impulsive behaviors or planned behaviors or not in this article.Through the brand value, conspicuous consumption and curiosity as a pre-change, and to test the consumer is affected by what factors to drive people to wait in line?A total of 750 questionnaires were distributed in this study and I have recycled 586 copies. Among them, there are 568 copies effective questionnaire. The effective questionnaire recovery rate was 75%. The results show that brand value has a positive effect on behavior intention and behavior willingness. Conspicuous consumption has a positive effect on behavior intention. Behavior intention and behavior willingness both affect the actual behavior, and behavior willingness is more powerful.Over all, brand awareness is the biggest cause for customers consuming. Therefore, in order to effectively prompt consumers to wait in line, industries should strengthen the brand management.

Special Session < Information Technology in Health Education >

Session Chair: Prof. Ya-Ming Shiue
Venue: Laboratory for Advanced Research B, Room 0112
Time: 15:00-16:00

Note:

*** Each presentation should be 10mins oral pretention + 2 mins Q&A.**

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SS06-01 (15:00-15:12)	Evaluation of A Mobile Learning System to Support Correct Medication Use for Health Promotion **Ya-Ming Shiue,** Yu-Chiung Hsu, Yu-Chen Liang and Meng-Huei Sheng Chia-Nan University of Pharmacy and Science, Taiwan Abstract--- Health education can be improved through the dissemination of information, effective communication, and education. Most health education interventions remain focused on traditional lecture methods and neglect the importance of student- centered learning approaches. Recently, the applications of mobile technology integration into innovative pedagogical approaches have resulted in new opportunities and challenges. The rapid development of mobile technology encourages student participation, knowledge sharing, collaboration, and the social interaction necessary to form authentic learning communities around student-generated content anytime and anywhere. Although mobile technology is a suitable support for learning and has received increasing attention at various educational levels, few studies have examined the effectiveness of mobile technology on health promotion. Therefore, this paper designed a context of correct medication use for mobile learning to investigate continuance usage intention. A total of 118 university students voluntarily participated in an introduction to health and food course for four consecutive weeks in this research. The findings revealed that student satisfaction had positive impacts on continued intention to use mobile learning. Moreover, the students with higher levels of enjoyment tended to be more satisfied, and they were more willing to continue using mobile learning.
SS06-02 (15:12-15:24)	A Study About the Factors Influencing Elders' Continuance Intention to Use APP Communicating with Local Community Cheng-Xuan Lan, Ya-Ming Shiue, **Chuan-Gang Liu** Chia-Nan University of Pharmacy and Science, Taiwan

	Abstract--- In Taiwan, in recent years, the government begins to pay attentions to the care of the elder at home. 10-years healthcare project 2.0 is designed to care the health of the elder. This project plans the construction of the whole elder healthcare and it contains three service levels, A, B, C class services. C class service consists two main roles, the elder and local community. This paper describes a communication APP developed by us to make the elder communicate with local community. We expect that the elder can easily communicate with local community around their living house. However, the study discussing the acceptance of the technology by the elder in this government project is very rare. This paper tries to use three famous theories, TRA, TRB, and Technology Acceptance Model (TAM) to evaluate the acceptance of the elder using communication APP with local community. We design our research model and hypothesis. Then, we make some experiments to show the results. We observe that the elder actually find this APP useful but the social presence of this tool obviously influence their will to use this technology tool. The result gives us the importance message to improve our APP and design a better technology- aid tool to help the elder stay at home safely in the future.
SS06-03 (15:24-15:36)	Impact of An Augmented Reality System on Students' Learning Performance for A Health Education Course **Ya-Ming Shiue**, Yu-Chiung Hsu, Meng-Huei Sheng and Cheng-Hsuan Lan Chia-Nan University of Pharmacy and Science, Taiwan Abstract--- In recent years, the innovative applications of integrated Augmented Reality (AR) into educational settings had increased rapidly in Taiwan. AR provides a scene from the real world while enabling users to interact with virtual and physical objects. This paper presents an empirical study that investigates middle-school students studying health education curricula related to the structure of the human body using AR technology with different learning style preferences. The Felder and Silverman Learning Style (ILS) instrument was used to test learners' individual learning styles. For this research, total 88 8th grade middle-school students voluntarily participated in health education courses for 4 consecutive weeks. The findings reveal that students with different learning styles have significant differences in learning achievement. Moreover, students in the AR experimental group seem to have learned more than the students in the control group. The research outcomes may have practical implications for educators who are designing educational AR applications.
SS06-05 (15:36-15:48)	Developing an Integrated Classification Model for Postprandial Blood Glucose: A Cohort Study Chi- Chang Chang，Jason Chou-Hong Chen，**Fong-Jung Yu** and Chi-Jie Lu Da-Yeh University, Taiwan

	Abstract--- Postprandial blood glucose elevation as a significant development of diabetes and cardiovascular diseases has been well-documented. Interestingly, few studies have provided an effective model for predicting the postprandial blood glucose elevation and to make inferences. This work presents the classification of postprandial blood glucose in a cohort study, by means of the integrating feature ranking with ensemble learning and logistic model trees. We used a cohort dataset that included 1,438 individuals from Landseed hospital in Taiwan. Data from 2006 to 2013 were collected. In order to evaluate the performance of the proposed model, four well-known data mining classifiers (Naive-Bayes tree algorithm, alternating decision tree, radial basis functions neural network and Adaboost.M1) are used in this study. As a result, the proposed model provided a reasonably accurate classification for predicting the levels of postprandial blood glucose. From it, our findings suggest that twenty-seven risk factors are identified as important risk factors for postprandial blood glucose elevation. With regard to role of postprandial blood glucose it should be emphasized, that not the postprandial blood glucose elevation per se, but rather the predictive factors of postprandial blood glucose are supposed to be related with development of related diseases.
SS06-06 (15:48-16:00)	Predicting Second Primary Cancer and Identifying Risk Factors for Breast Cancer Patients in Taiwan Chi-Chang Chang, **Ssu-Han Chen**, Chi-Jie Lu and Yen-Chiao Lu Ming Chi University of Technology, New Taipei City, Taiwan Abstract--- Cancer patients may suffer from a second primary cancer (SPC) after the original cancer was treated. Because there are more and more Taiwanese are riddled with SPC, it is necessary to precisely diagnose this kind of disease. After collecting over three thousand breast cancer cases from three hospitals in Taiwan, we attempted to build a model to predict the incidence rate and identify the risk factors of SPC. In the beginning a naïve prediction model was built which yielded an unsatisfied result. With more and more tricks such as upsampling technique, metric for selecting hyper-parameters, clustering strategy and stacking ensemble appended on the model, the accuracy was then getting higher and higher. Besides, we also found the top five important risk factors related to the SPC for breast cancer patients.

Special Session < Medical Care, Social Participation and Workforce of Long Term Care >

Session Chair: Prof. Liang-Ju Chen
Venue: Laboratory for Advanced Research B, Room 0911-1
Time: 15:00-16:00

Note:

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SS07-01 (15:00-15:12)	Duration and Determinants of First Unplanned Hospitalization among Nursing Home Residents **Hsiao Fang Hsiung,** Liang Ju Chen and Shu Fen Chi Chang Gung University of Science and Technology, Taiwan Abstract--- Background: Unplanned hospitalization is an important indicator of changes in nursing home care quality. Institutional residents have higher healthcare usage and hospitalization rates than do the elderly in the general population, leading to negative health effects and increased costs. This study aimed to examine the duration, causes, and determinants of first unplanned hospitalizations among nursing home residents. Methods: A retrospective cohort study was conducted of new residents admitted to nursing homes between 2006 and 2011, residents were observed until 2012 when the causes and duration of unplanned first hospitalizations were investigated. Data, including demographics, admission evaluation findings, care records, and emergency transfer records, were reviewed from resident care records. Results: There was a total of 622 subjects, with unplanned hospitalizations occurring in 54.7% (340) of subjects; the average duration to the first unplanned hospitalization was 13.9 months. From 2006 to 2011, incidents occurred on average at 15.2, 13.6, 10.7, 13.4, 7.8, and 3.2 months. The average duration between occurrences decreased over time. The primary diagnoses for first unplanned hospitalizations were fever, pneumonia, and urinary tract infection. A Cox proportional hazards model analysis showed that older age and the presence of a nasogastric tube, Foley catheter, pulmonary disease, cancer, and gastrointestinal diseases increased the odds of unplanned hospitalization among nursing home residents. Conclusion: Highly dependent nursing home residents requiring intensive care belong to a population at high risk of hospitalization. Future institutional care professionals should identify risk factors in order to provide more appropriate care strategies.

SS07-02 (15:12-15:24)	Workplace Bullying and Workplace Deviance: Example of Care Attendant **Pei-Jin Su**, Chen-Chieh Chang and Yen-Chun Peng Tungs' Taichung MetroHarbor Hospital,Taiwan Abstract--- Bullying has become an important social problem that is prevalent in organizations. Previous studies postulated that workplace bullying can cause physical and psychological harm to individual employees as well as increased costs and profit loss to the organization. Surprisingly, few studies have examined negative employee behaviors that may be triggered by workplace bullying. However, researchers have indicated that employees subjected to unfair treatment or disrespect may mollify their emotions by engaging in counter organizational actions such as workplace deviance or counterproductive behavior to emphasize their uniqueness and dissimilarity with the organization This study distributed a total of 500 questionnaires and collected 480. After eliminating invalid questionnaires, this study obtained a total of 420 valid responses, for a valid response rate of 84%. If the participants had answered "no" to all items in the workplace bullying, which indicated that they had not experienced workplace bullying in the past six months, their questionnaires were not included in the analysis. This resulted in the exclusion of 158 questionnaires; thus, 262 valid questionnaires were included in the final analysis. The demographic data of the participants are as follows: 128 were female (92.2%; average age = 50.55 years; standard deviation [SD] = 8.72 years). Regarding education level, 23 participants completed elementary school (8.9%); 63 completed junior high (24.4%); 122 completed high school or vocational high school (47.3%); 32 completed junior college (12.4%); and 18 completed university or above (7.0%). The results of this study showed that workplace bullying positively and significantly influenced workplace deviance. The self-reporting method and cross-sectional research design adopted in this study might have resulted in common method variance and limited our ability to make causal inferences. This study suggested future studies to obtain measures of predictor and criterion variables from different sources or ensure a temporal, proximal, or psychological separation between predictor and criterion in the collection of data to avoid the common method bias. Businesses should establish a friendly work environment and prevent employees from encountering workplace bullying. Next, an unbiased process for internal complaints should be established.
SS07-03 (15:24-15:36)	The Effect of Workplace Violence and Job Stress on Health Among Home Care Assistants Liang-Ju Chen, **Shi Ling Lin** and Wen Ling Huang HungKuang University, Taiwan Abstract--- Increasing prevalence of workplace violence in care institutions is an important

	issue in Taiwan. Workplace violence causes serious work stress for workers and makes the quality of care and worker's health worse whereas being ignored. The study aimed to analyze the effect of workplace violence and job stress on health among home care assistants. This cross-sectional study was developed the research structure by previous literatures. The finally valid samples were 620 home care workers in Taichung City; and data was collected during their on-the-job training courses by self-administered structured questionnaires, which were included personal and work characteristics, workplace violence, job stress, health condition were be analyzed. The statistical software SPSS version 19.0 was used to perform descriptive statistics, Chi-square distribution, correlation analysis and regression analysis. 69.8% of home care assistants had suffered any kind of work-related violence. Verbal violence (50.1%) and sexual harassment (46.4%) were the most common type on job. Besides, 42.3% had suffered more than two types of violence. The longer the working hours, psychological violence was significantly related with stress; the longer of working years, sexual harassment or psychological violence were significantly related with musculoskeletal and psychological health status. And job stress showed a significant positive correlation with health status. Psychological violence is not easy to observe but it is a significant impact on work stress and health. Care institutions should enhance workers how to overcome the emotional barriers from work, and reduce the stress form job making their mental and physical health worse.
SS07-04 (15:36-15:48)	The Relationship between the Use of Technology Products and Social Participation among Elderly Liang-Ju Chen, **Pin-Chun Che**n and Hsiao-Fang Hsiung Hungkuang University, Taiwan Abstract--- With the development of technology products, there will be more transmission methods to get information for social interaction. Elderly also involve to use technology products with the times and that may affect to participate social activities. This research aimed to descript the current state of technology products using, and examined the relationship between use of technology products and social participation. This was a cross-sectional study and analyzed the data from "2016 Survey of Living Conditions of the Elderly in Chiayi City". 17,886 subjects were selected with aged more than 65, living in the community, and normal cognition. The independent variables were personal characteristic, work and economic resource, status of technology products using, health and living arrangement; dependent variable was status of social participation. SPSS19.0 was used to perform descriptive statistics, Chi-square test and logistic regression analysis. The result was showed that 54.5% used the cell phones, and 15.9% knew how to use computer. Among 17,886 subjects, 1,917 were interested in social participating, and included to analyze for logistic regression. After controlling other variables, the probability of

	participating social activities was general households (OR=1.70), Taoism (OR=1.53) or folk beliefs (OR=2.05), without depression (OR=2.42), self-perceived health was fair (OR=1.97) or good(OR=1.62), using smart phone frequently and with skill to use multiple functions of computer (OR=1.79) , no spouse(OR=1.71), and with ability of going out by self (OR=1.84). The results will help us to understand what relationship between using technology products and social participation. Using mobile messaging and web platform might the strategy for promoting social participation.
SS07-05 (15:48-16:00)	A Mediating Effects of Job Satisfaction on the Relationship between Job Stress, Social Support and Intention to Stay of Home Care Workers in Central Taiwan **Liang-Ju Chen**, Jung-Hsuan Wang and Sin-Rong Yang Hungkuang University, Taiwan Abstract--- Increasing demand of home care workers is the trend of long term care, but the turnover rate of them is also higher than others. About the turnover rate of workforce, in the past studies were examined the effect of job satisfaction or job stress mostly, but rarely focused on both of them. The study aimed to explore the relationship between job stress, social support and the intention to stay, and job satisfaction as the mediator. The research was a cross-sectional study and self-administered structured questionnaire was used to collect data form home care workers in central Taiwan. The content of the questionnaire was included demographic and job characteristics, job stress, social support, job satisfaction, and intention to stay. A total of 330 questionnaires were delivered, 325 valid samples were collected, and the valid response rate was 98.5%. The statistical software SPSS version 19.0 was used to perform descriptive statistics, t-test, ANOVA, correlation analysis, regression analysis, and the Sobel test. There was a significant correlation between job stress, social support, job satisfaction, and intention to stay. A significant negative correlation was shown that the higher job stress, the lower job satisfaction and intention to stay. Conversely, social support and job satisfaction had significant positive correlations with intention to stay. Furthermore, job satisfaction played the full mediator role on the relationship between job stress, social support, and the intention to stay. Comparing with job stress and social support, job satisfaction had a greater influence on intention to stay. Therefore, the study findings may serve as a reference for policy of intention to stay and establishing strategies to enhance workforce stability among home care workers. Further study is suggested to concern on culture of organization, job competency, work environment, and workfare to improve high turnover rate and promote the growth of the home care workforce.

Special Session < Health and Biomedical Informatics >

Session Chair: Prof. Hsi-Chieh Lee
Venue: Laboratory for Advanced Research B, Room 0911-2
Time: 15:00-16:00

Note:

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SS08-01 (15:00-15:12)	Apneas Detection Based on Oxygen Desaturation Index **Chung-Chi Yang**, Fong-Ren Wu, and Jui-Chien Hsieh Yuan Ze University, Taoyuan, Taiwan Abstarct--- Obstructive sleep apnea (OSA) is one of most frequent sleep disorders. In clinical practice, apnea-hypopnea index (AHI) in-laboratory polysomnography (PSG) is the major diagnostic standard. AHI is the sum of apneas plus hypopneas per hour of sleep. However, PSG has limited in clinical setting. Objective: In this study, a real-time monitoring system based on a pulse oximetry wrist watch developed and it can detect oxygen desaturation index (average number of desaturation episodes/ hour, ODI). There is also a strong correlation between the AHI and ODI (accuracy 93%) , so ODI is effective in diagnosing OSA. Methods: we assembled a real-time health monitoring system based on a pulse oximetry wrist watch. The system comprised a soft sensor capable of monitoring blood oxygen levels (SpO2) with bluetooth functionality, which enables the continuous wireless transfer of data to a smart phone. Algorithm analysis detected two types of events in a sleep period based on blood oxygen levels: blood oxygen events (SpO2 events) and sleep apnea events (OD events). Results: Our result showed that the use of new developed wearable SpO2 & App system can detect oxygen desaturation events and create sleep apnea record easily. Conclusions: Ambulatory monitoring facilitated by portable equipment may be useful and promising in OSA.
SS08-02 (15:12-15:24)	A Real-Time SPO2 Telemedicine System **Shih-Yao Chou**, Meng-wei Hsu and Jui-chien Hsieh Yuan Ze University, Taoyuan, Taiwan Abstract--- Monitoring the saturation of oxygen (SpO2) in capillaries is essential for people suffering from chronic pulmonary diseases. Specially, noninvasive pulse oximeters have become one of major devices to monitor SpO2 at home. In this study, a real-time SpO2

	monitoring system is developed for advanced SpO2 analysis. A wearable reflective pulse oximeter was adopted to transmit the values of SpO2 and pulse rates (PR) via web bluetooth, and then the received data will be stored on a NoSQL based database, MongoDB. The clinicians can observe the SpO2 and PR in real time remotely, or perform SpO2 analysis, like as oxygen desaturation event (ODI) detection, on database. In conclusion, this system is novel, and can be applied on advanced clinical setting. It is expected that this developed system can be applied onto clinical setting for SPO2 telemedicine and facilitate the advanced development of smart algorithms related to SPO2 analysis.
SS08-05 (15:24-15:36)	An Optimized Method for the Limb Tremor Measurement **Weiqiang Zeng**, Hai Su, Haipeng Zhong, Haitao Cui, Lihua Sun and Linglin Xia Nanchang University, China Abstract--- Limb tremor measurement is a prerequisite for quantitative assessment of some dyskinesia. It is important to early diagnosis and treatment of disease, such as Parkinson's disease. There are many measurement methods and assessment parameters used for tremors evaluation. The frequency, amplitude, acceleration and displacement of tremor movement are typical parameters. Through former researches, these quantitative methods are not precise enough for the tremor. It is hard to reflect the Multi-Degree-of-Freedom (MDOF) properties of limb tremor movement, and not easy to the identification and diagnosis of diseases. This paper presents a new quantitative method of limb tremor. Two cameras have used to collect the moving images of the body tremor in real time. The tremor track has been reconstructed and tremor parameters have been calculated by a computer algorithm. These parameters are based on moving characteristics of MDOF. They can be used to evaluate the 3D spatial distribution characteristics, frequency characteristics and motion characteristics of the tremor, and also reflect the vector characteristics of the limb tremor.
SS08-07 (15:36-15:48)	Evaluating 15-Minute Mindfulness Effects via A Wearable EEG Devices **Yu-Hung Tung** and Jui-Chien Hsieh Yuan Ze University, Taoyuan, Taiwan Abstract--- Mindfulness is a popular practice, it is helpful to promote people well-being, its positive effects have been proved by prior researches. Mindfulness is not only helpful for individuals who having clinical disease, such as anxiety, depression, cancer and chronic pain, but also helpful for healthy individuals. Promotion mindfulness to healthy individuals is an important issue, because successful reducing daily life and working stress is the key to prevent disease. 15-minute mindfulness practice is a short time mindfulness easiest arranged in a busy modern life. Evaluate the effect of 15-minute mindfulness and look for available evaluation indicators via wearable devices is the aim. In our study, we record real-time information from a mindfulness participant via commercial

	wearable devices, evaluate the effect of 15-minute mindfulness and search for available evaluation indicators. We use commercial wearable devices to record real-time information pre-post mindfulness practices. We record electrocephgraphic (EEG) data via a wearable one-channel EEG device (Neurosky mindwave), simultaneously we can record heart rate data via a wearable heart rate measure device (Polar H7). Both EEG and heart rate information can be analysis We retrieve 30 groups attention, meditation data from Neurosky mindwave and 30 group heart rate data from Polar H7. The heart rate data can be used for heart rate variability analysis (HRV). Comparing data pre and post mindfulness, the result shows statistical significant difference for attention, medication, nLF, nHF and LF/HF. The result supports that 15-minute mindfulness is an effective practice, wearable device can be useful tool in further studies.

Session < Health Service Management >

Session Chair: Dr. Hsien-Wei Ting
Venue: Laboratory for Advanced Research B, Room 0913
Time: 15:00-16:00

Note:

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I0025 (15:00-15:12)	Strengthening Community Attributes in the Open clinic GA Open Source Collaboration: An Analysis of Prevailing Practices and Thoughts from Internet Blogs **Frank Verbeke** and **Ellen Schryvers** Vrije Universiteit Brussel, Belgium Abstract---In order to reach the objective of making the Open Clinic GA open source hospital information management system a broadly backed sustainable collaborative project, a community needs to be created around it. Since not much was found in scientific literature about creating, growing and maintaining open source communities, we searched the internet to learn from the experiences of open source users all over the world. The community attributes (i) feeling of belonging, (ii) social capital, (iii) belief, (iv) shared processes and (v) communication were identified from literature and served as a guidance for tagging and structuring the massive amount of information we got from open source community related internet blogs. The blog analysis provided useful practical tips for implementing the high level characteristics of effective open source communities. To generate a feeling of belonging, users and developers must be approached personally, the community needs a formal way to deal with conflicts and each member must have a fair chance to participate, whatever his skills and expertise are. People often contribute to an open source project in order to get some recognition. They can get this social capital through rewarding, but also through constructive feedback when they make mistakes. Both ways are important to show people they are considered to be contributors to a serious project. To keep contributing, people must believe in the community. Therefore, it has to be a well-functioning, welcoming place. To create this, we must be aware of the importance of shared processes to run such a community. Reasonable access policies and leadership are very important in this. Finally a solid communication strategy is necessary to bind all of these elements together. It must be kept in mind that users and contributors may live and work in different continents. There are lots of virtual communication tools cope with that, but one should not underestimate the importance of face-to-face meetings.

I0006 (15:12-15:24)	Generated Document Trees - Latent Dirichlet Allocation **Lawrence Master** Dakota State University, USA Abstract---Creating Structure or building hierarchy is a very frequently performed task. We are familiar with this act when organizing our documents in folders and subfolders on our personal computer hard drives and attempting to determine which documents are more "general" or should be in "parent" folders. When dealing with a handful of documents, the task is usually trivial. However, what about when a physician needs to diagnose a complicated disease and explore alternative treatments by attempting to sort through thousands of related article documents? In the past several years, machine learning and information retrieval techniques have been used to develop many topic models based on the extremely popular Latent Dirichlet Allocation algorithm. However, in the space of unsupervised dynamically generated document structures, this specific area of machine learning has been lacking. We propose a new method, which we call Generated Document Trees Latent Derelict Allocation. Our method does not rely on being given manually created document structures apriori and was developed to dynamically generate trees of documents in an unsupervised fashion. We show an example of its application on the TREC clinical decision support dataset and explore its performance.
I0161 (15:24-15:36)	Tea in Benefits of Health: A literature Analysis Using Text Mining and Latent Dirichlet Allocation **Ching-Hsue Cheng** and Wei-Lun Hung National Yunlin University of Science and Technology, Taiwan Abstract--- Tea originated in Asian, which was initially used as a medicinal herb. The variety of tea is according to different manufacturing processes and levels of oxidation. The different varieties of tea have different level of effects on health, thus this study adopted text mining technique and Latent Dirichlet Allocation (LDA) to analyze literature for tea in health effect. This study chose Web of Science as the database of literature source, and the search literature from 2007 to 2017. The total 1230 journal articles were collected in this study. The title, abstract, and keywords of the collected journal articles were used as a dataset for the experiment. Experimental results show that the VEM method is significantly lower than Gibbs sampling in perplexity. Hence, this study chooses K=150 when VEM method and Gibbs sampling reach the minimal perplexity in the same time. Many topics that related with tea and compounds of tea, however some topics had terms that related to health and disease. The top 10 topics show that tea could reduce the risk of diseases and benefit of health.

SS04-05 (15:36-15:48)	A Medical Co-creation System Crafts B2B Marketing Chien-Yi Yang and **(Abbott) Po Shun Chen** Chaoyang University of Technology, Taiwan Abstract--- B2B marketing is one of the important research topics for medical marketing. The information system can help the marketing process achieve the service innovation, corporate social responsibility and business performance. This study establishes a business cooperative system. That mainly provides hospitals and medical material manufacturers to make with customized products and value creation. Physicians, sales and designers are able to involve the design of processes, communication and synchronization; this real-time specialization system provides the most suitable communication process and complies with information security regulations.
SS04-06 (15:48-16:00)	A Study Case for Medical Material APP in Consumer Intention: An Interacting Marketing View **Yut-Su Lin**, Ming-Jyh Wang and Abbott Po-Shun Chen Chaoyang University of Technology, Taiwan Abstract--- The medical market is a key industry for Taiwan's vigorous development, especially in the orthopaedic materials market. Given the rising number of car accidents and cancer in Taiwan, the demand for orthopaedic surgery has shown an increase in output value. However, for most patients, when doctors perform surgery on patients, most of the medical equipment used are medical equipment imported from Western countries, and it is also less in line with the bone size of our people. Physician preparation before surgery In addition to ordering suitable materials, it is more important to communicate with the patient. Therefore, if the physician can use the app and order and manufacture the materials required for surgery in a transparent manner and then present it to patients or families of patients, it will be possible to greatly reduce the distrust of the doctor or the patient's family members. May increase the patient's or patient's family's passive or negative attitude, turning to positive. This study is aimed at the orthopedic medical device market in Taiwan. The complete international medical project in Taiwan has enabled Taiwan's medical care to keep pace.

Session < Biomedical Data Mining >

Session Chair: Prof. Chi-Hua Tung
Venue: Laboratory for Advanced Research B, Room 1001
Time: 15:00-16:00

Note:

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I0147 (15:00-15:12)	Analyzing the Terminal Protein Differences of Adenovirus Serotype 2(Ad2) and Human Herpes Virus-4(HHV-4) by Using Support Vector Machine Dain Kim, **Nooroo Bae**, Jihoon Yoon and Taeseon Yoon Hankuk Academy of Foreign Studies,Republic of Korea Abstract--- This experiment has the meaning for effective classification between Adenovirus serotype 2 and Human Herpes Virus-4 by discovering the Kernel Function which has low error rate using Support Vector Machine. Analyzing the differences would state the potential of developing medical remedy for Herpesvirus which has no vaccine of virus-specific therapy.
I0051 (15:12-15:24)	Using Data Mining Approach to Improve Diagnostic Accuracy for Bladder Cancer **Chia Lun Lo** Fooyin University，Taiwan Abstract--- The ninth most common cancer worldwide, bladder cancer, needs more prompt diagnosis and treatment to preventing progression of disease and improving patient survival because bladder cancer patients are often experience significant delays in diagnosis. Recent research has shown bladder patients, 18% required three or more visits before a diagnosis was made, and women are particularly likely to experience delays in care resulting in late stage at diagnosis. The causes of delays have been attributed to numerous factors, especially in the presence of hematuria. The clinical decision support system has been proposed with varying degree of success. In this study, we conducted the strategies by applying and evaluate the performance of data mining algorithms with fully clinical data to detect delays in delays in hematuria follow-up for bladder cancer patients. Strategies to ensure timely diagnostic evaluation of hematuria are

	needed to reduce delays in bladder cancer diagnosis. We developed a computerized trigger by data mining approach to detect delayed follow-up action on a urinalysis result with high-grade hematuria. The trigger scanned clinical data repository within the Fooyin university hospital in Taiwan to identify all patient records with hematuria, then excluded those where follow-up was unnecessary (e.g., terminal illness) or where typical follow-up action was detected (e.g., cystoscopy). We manually reviewed a randomly-selected sample of flagged records to confirm delays. We performed a similar analysis of records with hematuria that were marked as not delayed (non-triggered). We used review findings to calculate trigger performance. We believe our approaches are able to effectively detect delays in hematuria evaluation with high sensitivity and allow more efficiently detection of delays as compared to current non-selective methods.
I0164 (15:24-15:36)	A Method of Using Machine Learning to Predict Falls Risk **Way-Ren Huang**, Ruo-Chia Tseng, Tso-Ying Lee, Chun-Wen Huang and Woei-Chyn Chu Tzu Chi University, Taiwan Abstract--- In Taiwan, a falls accidents numbers ranking is higher. Taiwan government keeps how to prevent falls accident in Patient Safety Goals during 2016 thru 2019. Predictive modeling methods provide a framework by which health care provider can predict the likelihood that a patient will be preventing with an accident in the future. The goal in this study is to find risk factors associated with falls accident and to explore predictive models from accident report system. We evaluated three types of predictive models for falls accident using three analysis sets of features after feature selection: 1) Morse, 2) Accident Assessment, 3) Combined. Our results show that the features combined items have the best predictive model perform in this study. LR, and ANN give the best performing models and high AUC index more than 0.95. They are 0.999, and 0.997, respectively. In conclusion, we have identified falls risk factors by feature selection and evaluated predictive models of falls accident from target hospital. It can be used like a risk assessment model and provide a good prediction to those people need to know who high falls risk patients are.
I0014 (15:36-15:48)	Predicting Seminal Quality Using the Dominance-Based Rough Set Approach **Nassim Dehouche** Mahidol University, Thailand Abstract---Semen analysis is considered the standard test for evaluating male fertility. Though still useful, the test fails to predict fertility status early, when the early prediction of male fertility potential greatly increases the chances for successful treatment of infertility. Therefore, early diagnosis is often based on environmental or occupational factors known to influence fertility potential. Because these factors are numerous and their interactions

	intricate, machine learning methods have proved a useful support for clinical decision making in this context. The paper relies on the clinical data and setting of a previously published study. We identify two very questionable assumptions of said work, namely confusing evidence of absence and absence of evidence, and exploiting cardi- nal properties of attributes' domains. We then show that using an adequate methodology, which in this case consists in the dominance-based rough sets approach (DRSA), the predictive accuracy of the decision support system can be improved by nearly 50%, resulting in almost complete accuracy for a dataset of 100 instances. We provide links to open-data from the UCI machine learning repository to allow for an easy verification/refutation of this work.
M0003 (15:48-16:00)	Cancer Screening Decision Making Models Based on Health Status Utilities **John Maleyeff** and Danrong Chen Boston University, USA Abstract --- The presentation details an interdisciplinary effort that combines three healthcare research streams: cancer screening models, health utility estimation, and health communications. Although cancer screening is often recommended, there is no universally accepted framework for determining if a particular screening technology is worthy of consideration. Many practitioners (including many cancer-screening advocates) employ a single "does it save lives" decision criterion. Others mention an additional consideration - the prevalence of painful, unnecessary treatments due to false positive screening results. The aim of this research was to create a robust methodology that models the cancer screening decision from a patient's viewpoint. The model includes all of the uncertainties associated with cancer screening outcomes (both benefits and risks). It improves upon previous modelling efforts by using health status utility as decision criteria. Utility is the value a person places on an outcome that subjectively combines risk, emotion, financial and other considerations. The quantification of health status utilities encompasses the low-likelihood high-value of death prevention as well as the likelihood of unnecessary treatment, whose effects can vary from inconvenient to painful. A controlled (central-composite) data collection framework was employed to encompass a wide range of scenarios based on key uncertainties and false-positive implications. To reduce data inaccuracies, an innovative, graphical data collection mechanism was used to depict relevant likelihoods. This effort resulted in an equation that determines the optimal decision (to have or not to have a screening test) based on all relevant probabilities and the characterization of false-positive outcomes. The results can be used for system-wide recommendations or they can form the basis of an IT-based expert system to assist patients and their physicians with cancer screening decisions.

Session < mHealth Apps >

Session Chair: Prof. Kuo-Yi Lin
Venue: Laboratory for Advanced Research B, Room 1014
Time: 15:00-16:00

Note:

*** Each presentation should be 10mins oral pretention + 2 mins Q&A.**

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I0165 (15:00-15:12)	NFC Mobile Medication Video Notification System **Chun-Chi Wan**g and Jr-Ping Wang National Kaohsiung University of Science and Technology, Taiwan Abstract--- The growth of aging population can be a major issue in Taiwan. Besides, the elderly usually have chronic disease and Health problems. According to the studies, about 75% of elders suffer from chronic disease [1], and around 50% of elders have been diagnosed with two chronic diseases or health problems [1], so they must take medicine every day. Recently, about 60% of the household in Taiwan are double income [2]. Therefore, husbands and wives usually have a job, and their children might be studying in the school, so elders often stay alone in the home when their families go out for either working or studying. Thus, some of old men and women have hired a foreign nursing to take care of them. However, some foreign nursing's Chinese is pretty basic[3], and a number of elders who might take wrong medicine from time to time have poor eyesight. As a result, this research presents a design of NFC-based mobile medication Video Notification system for personal healthcare to help seniors.
M2003 (15:12-15:24)	Life Chasing - A Location-based Game Prototype for Elderly Health Promotion **Meng-Pei Lee**, Hsiang-Yu Hu, Hsing Mei Fu-Jen Catholic University, Taiwan Abstract—With the advent of the aging society, the health issues of elders are increasingly being considered seriously. Since appropriate exercise can promote health of the elderly

	people, many games focusing on health promotion have launched. However, the differences of deterioration and personal needs among elders are relatively large. Required exercises strength and length for each elder varies. Due to lacking physical fitness (including visual degradation), improper game interaction could make players uncomfortable, even worth, may be dangerous. After all, the design of game for elders is more complicated than for the average user. This research is aimed at developing an age-friendly location-based game prototype – Life Chasing, the goal is promoting the health of the elderly. The interface design of the game follows the Universal Design and the design-for-elderly guidelines. Besides various incentive mechanisms within the game play, an experience evaluation module is developed in Life Chasing. Based on the principle of experience design, the game will collect all game-related data, including environmental data; physical information of player, etc. The evaluation module returns the analytical results (including the heartbeat analysis from the integrated wristband) to the player, who can setup the game that best meets the individual's personal needs.
M0024 (15:24-15:36)	Critical Factors of Lean Healthcare: an Overview Carlos Zepeda-Lugo, **Diego Tlapa**, Yolanda Baez-Lopez and Jorge Limon-Romero Universidad Autónoma De Baja California, Mexico Abstract—Efficiency is a main goal in healthcare because it has an impact on safety, quality and waste reduction. To increase efficiency, hospitals and laboratories around the world have implemented Lean Healthcare (LH) in their processes. Reports of case studies, critical factors and benefits have been increased in literature. However, the recent scientific literature review addressing the evolution of LH, the status of critical factors and its impact on healthcare is scarce. Therefore, this paper is intended to provide insights of the LH phenomenon and its evolution in recent years by: (1) examining critical success factors of LH and (2) outlining LH benefit patterns. A total of 218 papers were included in a review of the literature following an adaptation of PRISMA methodology from 2002 to 2016. Ten critical success factors (CSFs) of LH implementation were identified and described.
M3002 (15:36-15:48)	The influence of communication method among clinic doctors on satisfaction of patients in Traditional Chinese Medicine hospitals in Beijing **Kunmeng Liu**, Ging Chan, Yuanjia Hu University of Macau , China

	Abstract —Objective: The way of disease inquiry among Traditional Chinese Medicine (TCM) doctor has certain uniqueness, which is different from the attitude of Western medicine treatment. In this study, we investigated the satisfaction of patients to the way of inquiry by TCM doctors, and deeply understood the psychological needs of patients for the communication mode of TCM doctors. Methods: A random sampling questionnaire survey was conducted on the outpatients of five Tertiary TCM hospitals in Beijing, and eight doctors were asked to have an interview. Data recording and analysis was using SPSS. Results: The sampled hospitals are Guanganmen Hospital of Chinese Academy of science of traditional Chinese Medicine, Beijing Chinese Medicine Hospital, Xiyuan Hospital of Beijing, Beijing Xuanwu Hospital of traditional Chinese Medicine, Dongzhimen hospital of Beijing. A total of 200 questionnaires were collected, of which 118 were women (59%) and 82 were male (41%). There were 86 people aged 30 and below (43%), 31 of 31~40 years old (15.5%), 42 of 41~50 years old (21%), 22 of 51~60 years old (11%), and 19 of 60 years old (9.5%).
M0026 (15:48-16:00)	A Method for Neonates Nursing Decision by Voice Identification Na Kang, Huiyan Wang, **Yufan Yuan** The Forth Hospital of Shijiazhuang, China Abstract—The voice information is the most direct and effective reflection of the physiology and psychology health of neonates. Nowadays, the traditional nursing model in the nursing center is the enumeration, so that the nursing efficiency is low and it is lack of scientific decision guidance. Therefore, a method for neonates nursing decision based on voice identification is proposed in this paper. First of all, on the basement of the physiology structure and emotion characteristics of neonates, the voice information under various emotion conditions are analyzed, and the corresponding nursing activity are provided. Furthermore, the multi-fractal de-trended fluctuation analysis algorithm for feature extraction is presented to acquire voice message parameters with various emotion. Finally, the nursing decision model is established. By the identification analysis of different voice signals, the decision for targeted nursing activity is realized, which is verified by the real sampled voice data.

Session < Electronic Health Records >

Session Chair: Dr. Chalong Cheewakriangkrai
Venue: Laboratory for Advanced Research B, Room 0107
Time: 16:20-18:00

Note:

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I0001 (16:20-16:32)	Assessing The Validity of a Data-Driven Population Segmentation Approach Using Electronic Health Record Database: A 4-Year Longitudinal Study on Health Services Utilization and Mortality **Michael Shi YAN**, Yuheng KWAN, Julian THUMBOO and Lian Leng LOW Duke-NUS Medical School, Singapore Abstract --- Data-driven segmentation of heterogeneous patient populations into parsimonious and relatively homogenous groups with similar health characteristics or utilization patterns can facilitate healthcare resource planning and guide development of effective interventions for each segment. Cluster analysis is an analytical method to group individuals into relatively homogeneous and mutually exclusive clusters. Using a large Electronic Health Records database, we segmented a general patient population by clustering analysis. All adult residents who resided within and had a healthcare encounter with at Singapore Health Services in 2012 were included (n=146,999). Age and healthcare utilization in 2012 were used for hierarchical clustering analysis (Ward's linkage) to determine the optimal number of clusters *k* followed by K-means cluster analysis. The segments were compared for their morbidities in 2012 and demographics. The validity of our segmentation approach was assessed by examining the discriminative ability of segment membership on longitudinal healthcare utilization and mortality from 2013-2016. Five distinct patient segments were identified in this study. Healthcare utilization in 2012, morbidities and demographics differed significantly across all segments. The "Frequent admitters" segment consisted of only 1.79% of the population but consumed 69% of inpatient admissions and 77% of specialist clinic visits in 2012. The segmentation has excellent discriminative ability for longitudinal healthcare utilization and mortality. The "Frequent admitters" segment accounted for a disproportionate healthcare utilization and 8.16 times higher mortality rate for 2013-2016. Data-driven clustering analysis identified five patient segments with distinct longitudinal healthcare utilization patterns and mortality risk to provide an evidence-based segmentation.

I0030 (16:32-16:44)	Towards Automated Knowledge Discovery of Hepatocellular Carcinoma: Extract Patient Information from Chinese Clinical Reports **Hongmei Yang**, Lin Li, Ridong Yang and Yi Zhou Sun Yat-sen University, China Abstract--- To accurately determine significant prognostic risk factors, patient information must be quantified accurately according to their extent of disease. An essential step for prediction of prognostic risk factors requires the determination of patient features which are typically hidden in electronic medical record(EMR). The goal of this study is to extract clinical entities of Chinese clinical reports, enabling automated hepatocellular carcinoma knowledge extraction. In this paper, we annotated hepatocellular carcinoma corpora with patient records from EMR database. We present a information extraction solution based on assembled method. Our evaluation dataset contains 3996 training sentences and 1570 test sentences. The evaluation metrics are precision, recall, F1 of extract matching. NER of admission reports, radiology reports and discharge summaries with F1 of 0.8449, 0.5935 and 0.7320 respectively. RE of overall F1 is 0.9129. This study prepares a foundation for larger population studies to identify clinical features of hepatocellular carcinoma.
I0037 (16:44-16:56)	Mental Health Surveillance from Elderly Health Examination Database in Taipei **Ta-chien Chan** and Yi-Syuan Wu Academia Sinica, Taiwan According to a WHO report, nearly 15% of adults aged 60 and over suffer from a mental disorder, constituting 6.6% of the total disability for this age group. Taipei City faces rapid transformation towards an aging society, with the proportion of elderly in the total population rising from 12% in 2008 to 16% in 2016. The aim of this study is to identify the prevalence of mental disorders among the elderly in different townships of Taipei City, and to also elucidate personal risk factors contributing to mental disorders. The elderly health examination database for 2005-2012 was obtained from the Department of Health, Taipei City government. We used a simplified mental health questionnaire including five questions to measure the mental health status of the elderly. A total of 86,061 people underwent publicly funded health examinations, with 218,774 visits. Each year, there are around 42,000 elderly in Taipei City using this service. The results show that among the elderly, being male, having higher education status, not taking any medicine, and regular exercise are all positively correlated with better emotional status. In addition, being divorced, not eating at least three portions of vegetables and two portions of fruits every day, and not drinking milk every day are correlated with poor mental status in the elderly.

I0049 (16:56-17:08)	Developing Epidemic Forecasting Models to Assist Disease Surveillance for Influenza with Electronic Health Records Yu-Lien Shih and **Yi-Ju Tseng** Chang Gung University, Taiwan Abstract--- Seasonal influenza is one of the most important infectious diseases that warrant monitoring by the Taiwan Centers for Disease Control (TCDC). However, due to variations in the attitudes of healthcare providers, influenza surveillance may be associated with under-reporting, which may result in underestimation of the prevalence of influenza in surveillance reports. Based on the electronic medical records (EMR) provided by Chang Gung Memorial Hospital (CGMH), we compare the number of influenza cases with the number reported by the TCDC between 2010 and 2015. There were 84,820 influenza cases matching the criteria. The epidemic trends of influenza agree with those reported by the TCDC and health insurance data. Through the exponential smoothing model (ETS model), the autoregressive integrated moving average model (ARIMA model), and the Prophet model, we train the models with weekly influenza cases from 2010 to 2014; we then renew the models in different intervals and compare their capacities. The results of the models of the Linkou and Kaohsiung branches show that the ARIMA model has the lowest RMSE and MAE value in both regions. While data from Linkou suggest that models should be updated weekly, data from Kaohsiung suggest that they should be updated monthly. In conclusion, we can use the EMR to survey and predict the influenza epidemic trend by using a time series model.
M0020 (17:08-17:20)	The Welfare Analysis for the New Co-Payment Policy for Emergency Department Visits under Taiwan National Health Insurance **Wen-Yi Chen** and Yu-Hui Lin National Taichung University of Science and Technology, Taiwan *Abstract*—Background**:** Emergency department (ED) overcrowding (that threatens quality and timely emergency care) is a common phenomenon, and potential Dead Weight Loss (DWL) of emergency care services under Taiwan NHI system is expected. Purposes: The purpose of this study is to explore the effectiveness of the new Taiwan NHI co-payment policy for the ED visits, and stimulate the welfare assessment of this new policy. Methods and Materials: Data sources for this research are from several open access databases. Monthly ED visits per capita, copayment, full price per ED visit, real total wage, and primary care volume were used to estimate the smooth time-varying co-integration(STVC) model generating the DWLs due to different co-payment adjustments for ED visits. Results: The STVC analysis suggest that there is a significantly negative relationship between the time varying price elasticities of ED visits (in absolute value) and the proportions of non-emergent ED visits in the medical centers. The mean DWL reductions due to our

	stimulating five different adjustments to copayments varying from NT$100 to NT$300 per visit for ED visits in medical centers were estimated to different from NT$88 to NT$172 per visit. Conclusions: Based on results obtained from this study, we conclude that the copayment adjustments to the ED visits in the medical centers is likely to generate little effect on the reduction of non-emergent ED visits and DWL due to low cost of ED visits under Taiwan NHI system.
I0142 (17:20-17:32)	Making Semantic Annotation on Patient Data of Depression **Du Yanan**, Lin Shaofu and Huang Zhisheng Beijing University of Technology,China Abstract--- Patient data, more exactly, electronic medical records (EMR), usually contain a lot of free texts. Those unstructured medical data cannot be easily understood by computers. In addition, EMR data have a strong privacy, which hinders the sharing and use of medical data and makes it impossible to conduct more in-depth medical research. This paper presents a method of the realization of semantic EMR by making semantic annotations on free texts in medical records. We will show how to use Natural Language Processing (NLP) tools to create semantic annotation with well-known biomedical terminologies/ontologies such as the Unified Medical Language System (UMLS). Moreover, we will describe how to make the semantic annotations on a set of virtual patient data for depression, which are generated by using the Advanced Patient Data Generator (APDG), a knowledge-based patient data generator. In short, our goal is to use semantic technology to improve the sharing and utilization of medical data and the interoperability among systems.
I0050 (17:32-17:44)	An Embedding-Based Approach for Oral Disease Diagnosis Prediction from Electronic Medical Records **Guangkai Li**, Songmao Zhang, Jie Liang, Zhanqiang Cao and Chuanbin Guo University of Chinese Academy of Sciences, China Abstract---This paper reports a diagnosis prediction study from electronic medical records (EMRs) of oral diseases. We propose to learn continuous vector representations (embeddings) of symptoms and diagnoses through training neural networks. To the best of our knowledge, this is the first attempt to apply word embedding to predicting diagnoses from stomatologic EMR data. Evaluations on real-world EMR datasets from eleven departments in Peking University School and Hospital Stomatology demonstrate that our model has produced promising results in diagnosis prediction. Compared with classic machine learning algorithms, our model captures the correlation between symptoms and diagnoses, which leads to the best performance in terms of accuracy, precision, recall, F-score, and Cohen’s kappa statistic. Visualizations illustrate the quality of the symptom and diagnosis embeddings

	generated by our approach.
I0173 (17:44-17:56)	Ensemble Learning for Risk Factors Identification and Secondary Cancer Diagnosis by Considering Class Imbalance **Xiucai Ye**, Tetsuya Sakurai and Chi-Chang Chang University of Tsukuba, Japan Abstract--- In recent years, the development and diagnosis of secondary cancer have become the primary concern of cancer survivors. For the real-world medical datasets, the data samples suffering from the secondary cancer is far less than that are not suffering, which leads to the class imbalance problem. The class imbalance problem is a common problem affecting data analysis due to the disproportionate number of class samples. In this study, we propose an ensemble learning method to deal with the class imbalance problem by using under sampling approach. The proposed method incorporates t-test and five data classification approaches, including k-nearest neighbor, discriminant analysis, decision tree, and support vector machine, Naive Bayes, to rank the importance of risk factors and diagnose the secondary cancer. The medical records and pathologic status provided by the Chung Shan Medical University Hospital, Jen-Ai Hospital and Far Eastern Memorial Hospital Tumour Registry are used in order to verify the feasibility and effectiveness of the proposed method. Experimental results illustrate that the support vector machine model is a superior approach in predicting the secondary cancer when the number of samples per class are roughly equal, while the performance of the decision tree model is more superior in the case of class imbalance. Moreover, the accuracies of most of the classification approaches increased after using the selected important risk factors as predictors. The information discovered in the experiments can provide important references to the personality and clinical symptom representations on all phases of guide interventions, with the complexities of multiple symptoms associated with secondary cancer in all phases of the recurrent trajectory.

Session < Healthcare Quality Management >

Session Chair: Prof. Yen-Chiao (Angel) Lu
Venue: Laboratory for Advanced Research B, Room 0108
Time: 16:20-18:00

Note:

*** Each presentation should be 10mins oral pretention + 2 mins Q&A.**

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I0038 (16:20-16:32)	Evaluating Hospital Service Quality: A Combination of the AHP and TOPSIS M. Mujiya Ulkhaq, Finsaria Fidiyanti, **M. Fauzan M. Raharjo**, Aryati D. Siamiaty, Rahayu E. Sulistiyani, Pradita Y. Akshinta and Eriawan Agung Nugroho Department of Industrial Engineering of Diponegoro University,Indonesia Abstract--- The provision of high quality services is crucial to achieve the Millennium Development Goals. Hospitals, similar to other service providers, also have to enhance their health care services quality in order to retain their existing patients and attract new ones, since it is major concern for the patients when seeking health care services. In order to assess the service quality of the hospitals, this research tried to evaluate hospital selection by utilizing six criteria along with their sub-criteria. Those criteria are professionalism, empathy, responsiveness, reliability, assurance, and tangible. The analytic hierarchy process (AHP) and technique for others reference by similarity to ideal solution (TOPSIS) were combined to accomplish the objective of this study. First, the AHP was used to determine the weights of the criteria and their sub-criteria. The weights that have been identified were then employed to select the best alternative using the TOPSIS. A case study to exhibit the applicability of the methods was conducted to evaluate three hospitals in Semarang, Indonesia; they are called Hospital A, Hospital B, and Hospital C. Data were collected and compiled from four doctors who are specialized in four different areas, i.e., general surgeon, urology, endocrine internist, and pediatric surgeon. The AHP result showed that responsiveness was labeled as the most important criterion with weight of 0.281. Hospital A were regarded as the most preferable one based on TOPSIS calculation. The finding of this study might offer the director of the hospital with valuable insight into the criteria that reflect customer's assessment in hospital selection.
I0041 (16:32-16:44)	Association of Sociodemography and Cardiometabolic Factors to Stress: A Cross-Sectional Study Among Employees in X University, Jakarta **Lumintang AV, Handayani LGLR and Putri LR** Universitas Indonesia， Indonesia

	Abstract--- Stress is one of main problem faced by workers; in America 8 out of 10 or 83% workers have stress and the number of stress increases 64% among workers in Indonesia 2012. People who diagnosed with cardiometabolic syndrome tend to experience stress and this stress can decrease productivity among workers. The study purpose is to identify factors related to stress in workers including cardiometabolic syndrome and sociodemography factors. This research was a cross-sectional study of 115 workers and used primary data by measuring BMI, cholesterol level, blood pressure and SRQ 20 stress questionnaire. Bivariate analysis was used to identify the relation between cardiometabolic and sociodemography to stress. Multivariate analysis was used to identify factors that had higher risk to stress. Research outcome showed that in obesity group there was 4 workers (6.2%) had stress with p value 0.18 (95% CI 0.08-1.59), while in high cholesterol level group there was 6 workers (7.9%) had stress with p value 0.97 (95% CI 0.24-4.35). In hypertensive group there was no workers had stress with p value 0.99. Bivariate analysis showed that sociodemography factors such as age, gender, education, type of work, employment status and marriage status did not correlate with stress, but multivariate analysis showed that age ⩾ 40 years old had higher risk to stress with p value 0.025 (95% CI 3.13 - 4.78 e 6. Along with age factor, employment status of University X employee also showed higher risk to stress with p value 0.02 (95% CI 2.82-3.10 e 6). This study showed that there was no relation between cardiometabolic factors and stress but unexpectedly with multivariate analysis showed that age ⩾ 40 years old and University X employee status most likely had high risk to stress. Therefore, health promotion of stress management among high risk people should be increased, considering that stress in workers caused low work productivity, resulted in lower national income of a country.
M0005 (16:44-16:56)	Reliability of Thyroid Dysfunction Questionnaire (TDQ) **M Mutalazimah,** Budi Mulyono, Bhisma Murti, Saifuddin Azwar, Pramudya Kurnia Universitas Muhammadiyah Surakarta, Indonesia Abstract --- The majority of coconut oil (65%) is made up of medium chain triglycerides (MCT), which are triglycerides and fatty acids with a carbon length chain of 6 – 12. Licorice non-polar flavonoids (LNF) is a new functional food ingredient consisting of hydrophobic licorice polyphenols in medium-chain triglycerides.. In this study, the coconut oil extraction (COE) of non-polar flavonoids contents of licorice (*Glycyrrhiza uralensis* Fisher) and *Salvia miltiorrhiza* Bunge were optimized using response surface methodology (RSM). A quadratic model was applied to predict the behavior of samples. Central composite design was employed using 18 treatment and 4 repeat in central points. The independent variables factors were temperature (30-80 ℃), time (2-12 hour) and ratio (100-600mg) for evaluation of extraction yields and compounds (dehydroglyasperin C & D, isoangustone A, salvianolic acid) of extracted licorice by HPLC. Effects of extraction ratio found to be significant on all responses. Optimal COE conditions for yield were identified as 450 mg/ml ratio, 32 ℃ temperature and 7 hour. Optimal COE conditions for active compound extraction were

	identified as 500 mg/ml ratio, 35 ℃ temperature and 7 hour. Finally, optimal COE condition for antioxidant inhibition(%) were identified as 415.85 mg/ml ratio, 86 ℃ temperature and 9 hour. Experimental values for response variables at these optimal conditions match well with the predicted values. This methodology could be applied in the extraction of non-polar bioactive compounds in the natural product industry.
M0014 (16:56-17:08)	Vascular and dementia survey in aged volunteers involving in recycling work in North Taiwan **Shinn-Kuang Lin** Taipei Tzu Chi Hospital, Taiwan Abstract—Stroke and dementia are two most common causes of psychophysical and socioeconomic burdens. We performed seven studies in volunteers participating in recycling work with age ≧ 60 years, including: 1) body mass index (BMI), 2) fasting glucose, 3) fasting cholesterol, 4) ankle-brachial index, 5) carotid duplex sonography, 6) Five-item Brief Symptom Rating Scale, and 7) Eight-item Interview to Differentiate Aging and Dementia. 985 subjects with a mean age of 70.8 years were surveyed. Among those, 81% were female and 52% were vegetarians. Obesity, hypertension, hyperglycemia, hyperlipidemia were found in 21%, 38%, 35%, and 27% of all subjects, respectively. Carotid plaques were detected in 45%, 16%, and 7% of subjects with mild, moderate and severe degree of atherosclerosis, respectively. There were 13% subjects with cognitive dysfunction while only 1% subjects with depression. Significant predictors of atherosclerosis were: aging, male gender, history of heart disease, hyperlipidemia, and elevated blood pressure and cholesterol. Asymptomatic carotid atherosclerosis was common. Vegetarians had reduced risk of atherosclerosis. Recycling work is helpful in psychomental health.
M3001 (17:08-17:20)	Situational Analysis on Health Services for People with Chronic Diseases and Groups with High Risk: A Case Study at Kohkha Municipality, Lampang, Thailand **Lapatrada Numkham**, Kaysorn Sumpowthong, and Porntip Chompook Thammasat University, Lampang Center, Thailand Abstract —The aim of a mixed-method study was to explore the situation of health services for people with chronic disease and the risk group at Kohkha municipality, Lampang, Thailand.The sample for quantitative study was 285 people (171 of chronic disease and 114

	of the risk group of DM/HT participants). The samples for qualitative study comprised of 3 sectors: community sector, local government and government hospitals. Data for quantitative were collected using questionnaire-based and for qualitative were collected using focus group interview. Quantitative data were analyzed using descriptive statistics and qualitative data were used content analysis. The results revealed that most of the participants being women with 75%, and with a mean age of 61.3±10.3 years. The majority of the participant who were people with chronic disease in the study had hypertension (51.9%), and had excess waist circumference (53.3%). The participants reported on self-management support from the health care teams was moderate level (49.8%). Community health volunteers had an important role to encourage and raising health awareness in the community
I0026 (17:20-17:32)	Prediction of Loneliness in Older People **Hui Yang** and Peter A. Bath University of Sheffield, UK Abstract--- Older people are especially vulnerable to loneliness that has become a major public health concern for people in later life. In this paper, we propose a machine learning based approach to predict loneliness probability using two gradient boosting algorithms, XGBoost and LightGBM. The predictive models are built on a large nationally representative sample from the English Longitudinal Study of Ageing (ELSA) with 7 successive waves (2002 ~ 2015). The system achieves good performance with a high AUC (Area Under Curve) of over 0.88 and a low LogLoss (Logarithmic loss) of 0.22 on the test data by both algorithms. Moreover, we investigate a wide range of variables to identify significant risk factors associated with loneliness. Specific categories associated with important variables are also recognized by the model. Such information will further enrich our understanding and knowledge of loneliness causes in the elder.
SS08-03 (17:32-17:44)	A Study of the Multi-Agent Benefit Distribution Model in the Transformation of Medical Science and Technology Achievements **Qiang Fu**, Yulan Wu, Xue Jiang, Ming Gao and Yang Xu Peking University, China Abstract--- At present, the development of the medical and health field is deeply concerned and supported by all sectors of society. Through investigation, it was found that although medical institutions in China have a large number of scientific research outputs, they are less able to achieve intellectual property rights and the conversion rate of scientific and technological achievements is very low. That's to say, the technological innovation in medical institutions is faced with the dilemma of how to transform of medical science and technology

	achievements. In this context, this article takes R&D units, production units, and medical institutions as the focus. Through constructing models, model simulation, and results analysis, we focus on exploring the relationship among multi-agent benefit distribution in the process of transforming medical science and technology achievements, we also dedicate to exploring the effective ways to improve medical achievement transformation rate. Besides, the effective means of transformation efficiency also provides new thinking for the transformation path and system construction of medical achievements.

Session < Health Policy and Management >

Session Chair: Prof. Jason C.H. Chen
Venue: Laboratory for Advanced Research B, Room 0112
Time: 16:20-18:00

Note:

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I0002 (16:20-16:32)	This is Why We Have to Do It for Using Health Information Usefully and Safely **Rie Misawa** National Hospital Organization Shinshu Ueda Medical Center, Japan Abstract---In our hospital, an electronic medical record system was introduced in September 2010 and the system was updated for the first time in May 2016. We aim to solve various problems at an early stage which occur after updating the electronic medical record system. After updating, we have established a new work system. In our new system, Health Information Managers (HIM's) also cooperated to solve the problems. First of all, HIM's investigated the problems to obtain some ideas about their location and cause. The HIM's then reported the investigation results to the SEs. And the SEs performed a detailed analysis of the problems using information processing technology. After that, the SEs requested the system vendors to confirm the problems according to their analysis results. Previously, it took more than one month to solve the problem in some cases. However, our new work system made it possible to solve the problem in about a week.
I0027 (16:32-16:44)	The Exploration of Planned Extubation of Cardiovascular Surgery Patients in a Southern Taiwan Hospital **Jia-Wei Lin**, Ai-chin Cheng, Shu-Chen Hsing, Shih-Jen Chiang, YC Hsu and Sho-fang Chang Chi Mei Medical Center, Taiwan Abstract--- Cardiovascular disease ranked second in the top ten causes of death in Taiwan. Cardiovascular surgery (CVS) was high risk, high mortality and high costs. The aim of this

	study was focused on the exploration of planned extubation for the cardiovascular surgery patients. This retrospective observational study was in a medical center in southern Taiwan. All patients admitted to the surgical intensive care unit (ICU) were enrolled between 01 Jan 2016 and 31 Dec 2016. Those who were received operation and planned extubation included in this study. Successful extubation was defined as no re-intubation over 72 hours after extubation. Statistical analyses were conducted using the SPSS software package (version 18.0). The results are expressed as mean standard deviation (SD) for continuous variables and frequency (%) for categorical variables. The data was analyzed using the chi-square test and Student's t-test. For all tests, a p value of less than 0.05 was considered statistically significant. No eligible patients required exclusion from this study. A total of 206 patients were enrolled during the study period with a mean age of 62.3±13.6 years (range, 24 to 92) who was assigned into successful extubation group within 72 hrs and failed extubation group within 72 hrs, and then the successful extubation ratio was 96.1%. Overall, 8 patients (3.9%) who needed to re-intubated within 72hrs. The TISS had a significantly higher incidence of re-intubation (34.7±8.9 vs. 26.9±9.0, p = 0.016). Especially, TISS≥32.5; AUC 0.749 (95% CI: 1.586-109.250 and P = 0.017). In addition, ICU length, hospital length, hospital mortality, costs were obviously much lower than the failed extubation group (p <0.001). The results of this study show that TISS also demonstrated for re-intubation prediction within 72hrs.
I0034 (16:44-16:56)	Successful Experience on Procuring Organ Donation: A Case Series **Hung-Ching Wu**, Jia-Wei Lin, Mei-mei Sung, Chin-ying Ho and Shofang Chang Chi Mei Medical Center, Taiwan Abstract --- The large gap between supply and demand imbalance of organs donation in Taiwan. This is an important social issue. This case series investigates successful experience on procuring organ donation. 5 patients of brain death whom met criteria of organ donation duration October 2016 to November 2017 and have been persuaded into procuring organ donation by the Organ Transplantation and Donation Committee at Chi Mei Hospital. We based on shared decision making, then 4 donors had successfully donated their organs who that were divided to the following groups:3 head injury patients by traffic accident;1 cerebrovascular disease patients , who donated 2 hearts, 4 livers, 3 kidneys, 2 lungs,1 pancreas,3 cornea and skin, which were beneficial for 23 recipients. This study released of why relatives of donors agreed to donate organs were as followings :(1) the principle of beneficence (2) religious belief. We are expect of provide and built model to procure organ donation in the future.

M1001 (16:56-17:08)	Health Insurance, Treatment & Lung Cancer Survival: The Commonwealth of Kentucky Study Case **Morita Sari**, James. W,.Holsinger, Sarah Wackerbath, Richard Ingram Muhammadiyah University Surakarta, Indonesia Abstract—**Background**: Kentucky is one of the thirteen states in Appalachia in which economy inequity contributing on a good health. Mostly residents of Appalachia do not have access to the same economic resources as the rest of the US population. This study will evaluate lung cancer survival rate for Kentucky state population based on health insurance type and treatment in the regard of United Stated health policy. **Methods**:Lung cancer data from 49,512 patients are withdrawn from Kentucky Cancer Registry from 2000 until 2011. Cox regression analysis and Kaplan Meier survival trend were performed to identify variables affecting treatment and survival. **Results:**The interaction analysis both from Cox Regression and Kaplan Meier estimate showing that patients with private insurance and early stage of lung cancer has lowest risk and longer survival time. **Conclusions**: Lung cancer survival rate in Kentucky remain poor. Most population include in Medicaid and Medicare program which does not give significant improvement on treatment. On the other hand having insurance is much better rather than none.
M0015 (17:08-17:20)	Policy Options for Cervical Cancer in the Pacific **Ledua Tamani** Fiji National University, Fiji Islands Abstract — **Introduction:** Cervical cancer in the Pacific was tabled as an area of health concern to the Pacific Islands Forum Leaders meeting in 2015. This report provides a situational anyalsis on current interventions (screening methods and treatments) in each country, the burden of cervical cancer, and the available policies that are currently in place to address cervical cancer and possible policy options as a way forward. **Method:** The study focused on the current situation of cervical cancer in the Pacific region with consideration given to the current country programs in cervical cancer screening, vaccination and treatment. A desktop review of the literature through available policies, reports and studies on cervical cancer programs from the 14 Pacific Island Countries (PICs). A further literature review was conducted on cost-benefit analysis for cervical cancer programs in low resource settings to advise on policy options for the Pacific. **Results:** Cervical cancer screening programs and treatments varies across the 14 PICs. Most PICs, do not have proper cervical cancer screening programs in place, and nor are there proper treatments options. PICs are still practicing invasive treatments when other treatments are available to women with precancerous lesions. **Discussion:** Based on each country's current health system, cervical cancer disease burden,

	resources and financing, options have been stipulated in accordance, to a country's ability to implement an intervention. From the body of evidence, highlighted by the cost-benefit analysis on cervical cancer implementation strategies. The recommendations are divided into a two categories as a regional action and at each 3 policy options at country level.
I0149 (17:20-17:32)	Sex and Ethnicity as Contributing Factor to the Development of Torus Palatinus and Its Characteristics: a Cross-Sectional Study Among Western Indonesian Population **Raka Aldy Nugraha**, **Kiwah Andanni Bangsawan**, **Aditya Indra Pratama** and Aswin Guntara University of Indonesia, Indonesia Abstract--- Background: Torus palatinus is a bony protuberance in the hard palate. Sex and ethnicity are considered to be the influencing factors for the development of torus palatinus. To date, studies assessing the prevalence of torus palatinus and its contributing factors in Indonesia are still lacking. Hence, the objective of this study was to investigate the prevalence and characteristics of torus palatinus and its association with sex and ethnicity among western Indonesian population. This study was conducted using cross-sectional design in 274 new students of Universitas Indonesia. Subjects who are of racial background other than western Indonesian Mongol and who had history of surgical removal procedure of torus palatinus were excluded from this study. Data were collected consecutively through questionnaire-filling and direct oral examination. Descriptive data was presented as frequency and bivariate analysis was conducted using chi square test for categorical variables. Relative risk value was calculated separately to assess for the association between variables studied. Torus palatinus were found in 212 subjects (77.4%), mostly small in size (< 3 mm) and single in number (50.5% and 90.6%, respectively). The prevalence of torus palatinus were found to be significantly higher in women than in men (RR 1.24; 95% CI: 1.09-1.41; p = 0.0006). Small-sized tori was more commonly found in males (67.9%), whereas in females, medium-sized tori (50.9%) was the most prevalent (p <0.001). In contrast, single tori predominated the prevalence of torus palatinus in both men and women (92.5 and 88.7, respectively). There was no significant correlation between ethnicity and the occurrence of torus palatinus among Western Indonesian population. Torus palatinus was prevalent among Western Indonesian population. It showed significant positive correlation with sex, but not with ethnicity.
I0004 (17:32-17:44)	Understanding of Users' Response to the Intervention of FDA's New Deeming Rules in Twitter **Yin Luo**, Qiudan Li, Song Sun, Daniel Zeng and Scott J. Leischow

Beijing Institute of Technology, China

Abstract--- On May 5, 2016, the U.S. Food and Drug Administration (FDA) finalized a rule extending its authority to all tobacco products, including e-cigarettes, cigars, hookah tobacco and pipe tobacco, among others, which aims to help protect Americans from the dangers of tobacco and nicotine, especially the youth. The policy can be seen as a new intervention and become a hot discussion topic among the users in Twitter.

This paper aims to examine the tweets related to the FDA's new policy in the social media, and gain a systematic understanding of users' responses to the intervention and the regulation.

A total of 13864 tweets related to the policy from May 1st, 2016 to May 31st, 2016 were collected and analyzed, the support and opposition viewpoints about the six aspects including Regulation, Health, Industry, Democracy, Science, and Children were summarized, the time-sequence co-occurrence pattern of high-frequency words and the analysis of retweet and user dissemination network were analyzed.

Tweets are classified into six broad themes: Regulation, Health, Children, Industry, Science, and Democracy, the number of tweets about the six themes is 7547, 2764, 1678, 795, 670, 45. There are more supports on Regulation, Health, Science, and Children, the ratio of support(opposition) on the four themes are 80.6%(19.4%), 74.9%(25.1%), 85.9%(14.1%), 75.8%(24.2%), respectively, as for the themes of industry and democracy, most users hold the opposing view. The co-occurrence frequencies of "vaping" and "vape", "stocks" and "bigTobacco", "vapingsaveslives" and "ivapeivote" are 328, 61, 104. A network with 222 retweets and 361 replies is constructed. Among the 361 replies, there are 62 negative replies accounting for 17.2%, 120 positive replies accounting for 33.2%, and 179 neutral replies accounting for 49.6%. It shows clearly that social media such as Twitter can be employed to gather valuable user feedback effectively and response on the government regulation.

Special Session < Value Co-Creation of Emerging ICT Technologies and Healthcare Service Management-Innovating the Future >

Session Chair: Prof. Hao-Yun Kao
Venue: Laboratory for Advanced Research B, Room 0911-1
Time: 16:20-18:00

Note:

*** Each presentation should be 10mins oral pretention + 2 mins Q&A.**

*** The certification of the best oral presentation will be awarded at the end of the conference at the closing ceremony.**

***To show the respect to other authors, especially to encourage the student authors, we strongly suggest you attend the whole session, the scheduled time for presentations might be changed due to unexpected situations, please come as early as you could.**

SS05-01 (16:20-16:32)	The Impact of PAC on Quality of Life among Stroke Patients **Yu-Jo Yeh**, Chung-Yuan Wang, Chung-Yuan Wang, Hsiu-Fen Lin, Kuo-Wei Hung and Hon-Yi Shi Kaohsiung Medical University, Taiwan Abstract--- It has started 'the demonstration on improving the quality of PAC' in 2014 trying to enhance the overall functional status of stroke patients and provide better quality of cares in Taiwan. Therefore, the study purposed to explore the impact of PAC on quality of life among stroke patients. It has started 'the demonstration on improving the quality of PAC' in 2014 trying to enhance the overall functional status of stroke patients and provide better quality of cares in Taiwan. Therefore, the study purposed to explore the impact of PAC on quality of life among stroke patients. The result showed that MRS, BI, EQ5D, IADL and BBS had a dramatic improvement from the baseline to the 6th week, the 12th week and 1 year throughout the study period ($P<0.01$), though the EQ5D and BBS had better quality at the 12th week than 1 year. Moreover, it also showed that pre-admission functional status was the best predictors of the 1 year QOL after admission (the latest examination) ($P<0.001$). PAC demonstration significantly increased QOL in stroke patients. However, an evaluation of QOL should consider several factors other than PAC. Additionally, patients' QOL improvements after PAC depend on their preoperative functional status.
SS05-02 (16:32-16:44)	Computer Aided Diagnosis of Heart Disease in Children Based on Classification Algorithm Cheng-En Tasi, Chu-Chuan Lin and **Chun-Wang Wei** Kaohsiung Medical University,Taiwan

	Abstract--- According to WHO statistics, 17.7 million people die of heart disease each year. Studies indicated that about 8 to 10 out of every 1,000 children have congenital heart disease. This study is expected to develop a computer-aided diagnosis mechanism for heart disease in children by analyzing the clinical diagnostic data, which is helpful for the diagnosis of early cardiac diseases. The study used 12,000 confirmed medical records to establish patterns. The data attributes include: age, sex, heart rate, ECG statistics (PR, QRSd, QT, QTc, P Axis, QRS Axis, T Axis), and 71 diagnostic results of different diseases. In this study, a classification model was established by algorithms such as Neural Network and Support Vector Machine. If the classification results were not consistent with the diagnosis results, we discussed with the specialist, and then adjusted the algorithm rules. The data were divided into training (80%) and prediction (20%) datasets. The results show that the classification results of the proposed algorithm can reach 100% accuracy.
SS05-04 (16:44-16:56)	Application of E-Da Healthcare Cloud in Health Management and Health Promotion **Chao-Sung Chang**, Chih-Lung Hung, Te-Tsun Shen, Shiuh-Ming Huang and Pen-Tsung Huang E-Da Cancer Hospital and I-Shou University, Taiwan Abstract--- Cloud computing is the emerging technology can be utilized to build up a composite network to enhance the healthcare management in both disease treatment and management. The advent of information technology has brought a new paradigm of healthcare management in various diseases and fields in hospital management. Using AI technology including machine learning and deep learning technique, we build up an IDES-Model-H platform with SPARK and Tensorflow technology and based on GreenPlum cluster database. The system has been designed to increase efficiency of healthcare management, to predict health status and health self-management of the clients and to help the doctor for clinical decision making. We also develop web service and app for the health self-management of the clients in various chronic disorders e.g. metabolic syndrome. Therefore, this paper recommended a model of designing flexible e-healthcare management system based on Cloud Computing and Service Oriented Architecture (SOA). The applications are deployed in the area of, first, disease prevention and personal health management, and second, helping physician in clinical decision-making to improve clinical outcomes and promote physician-patient relationship.
SS05-05 (16:56-17:08)	A Sensor-based Plastics Rod with Cloud Service for Upper-limb Rehabilitation Chin-Shiuh Shieh, Ching-Hsin Kao, **Yu-Heng Lin** and Mong-Fong Horng National Kaohsiung University of Science and Technology, Taiwan Abstract--- A sensor-based flexbar (SFBAR) is designed to guide the patients with upper-limb

	fractures in rehabilitation. This flexbar is a creative system equipped with a low-power microcontroller, passive pressure sensors and a wireless interface connecting a tablet to help patients to have convenient, safe and efficiently rehabilitation either at hospitals or at homes. In addition, the flexbar receives the personal treatment of rehabilitation from the therapist at hospital to determine the strength, count and duration in training. Based on the measurement and analysis of the signal from a sensor of micro gauge, this developed flexbar improves the defects of traditional approaches to upper-limb rehabilitation. The proposed solution offers various beneficial functionalities for rehabilitation patients. SFBAR returns the rehabilitation activity logs of patients to cloud servers. Through the log analysis of cloud service, more accurate therapy of rehabilitation will be offerrable.
SS05-06 (17:08-17:20)	Critical Values Notifications and Management to Improve Patient Safety: Using Mobile Devices to Improve Critical Value Notification **Shu-Ching Hsueh**, Yi-Ching Lin, Chao-Ju Chen, Shiuh-Liang Hsu, Su-Chin Liang and Fong-Chin Wang Medical University Hospital, Kaohsiung Medical University, Taiwan Abstract--- In 2005, in order to the improve the patient's safety, the Joint Commission (JC) released a laboratory Accreditation program which reported critical results became a National Patient Safety Goal. In medical center, the IT information was applied to improve the laboratory critical values (LCVs) in 2015. This is crucial in protecting the patient's safety. In the medical center, we the develop clear policy for the management of the process for reporting of critical test results, such as laboratory critical value (LCV) list and thresholds, identification and notification of LCV. Initially, the report of laboratory critical values notified the attending physicians, resident physician or a nurse in charge of patient care. If they don't receive the report of LCVs, the notification will be notified by SMS or telephone again after 20 minutes. The traceability of any action and time registration is available on the HIS. Based on literature, many accreditation standards or medical professional experience, hospital LCVs policy recommended that alert lists are segmented into two levels of urgency: first, the patient is in imminent danger of death unless treated immediately; second, significant-risk or abnormal but non-lifethreatening test results may require timely action. We use the information technology to improve the critical results communication such as in SMS notification, computerized physician order entry, and mobile App etc. The LCV report within 30 minutes had been improved from 14% September 2015 to 90% December 2016. In 2017, LCV report within 30 minutes was about 97% (n=2,097; threshold: 90%) in the medical center. The types of critical values are 69% of critical hypoglycemia, 17% of critical hyperkalemia, 8% of critical hypercalcemia and 6% of critical acidosis, respectively. The type of specialist is 43% internal Medicine, 22% surgery, 18% emergency and 16% pediatrics. Type of the notifications of LCVs for patients most use IT notifications. As the ultimate goal of LCVs notification is to improve the quality of care and patient's safety, in the further the quality indicators could be established for monitoring clinicians' behavior and patients' outcomes.

SS05-07 (17:20-17:32)	Employ Team Resource Management to Construct the Teamwork of Neonatal Resuscitation Program Pi-Yueh Lee and **Chin-Yen Tsai** Yuan`s General Hospital,Taiwan Abstract--- Along with increasing rate of high risk pregnancy and parents' high demands of child's medical right, our hospital was planned to be a high-risk pregnancy care responsible hospital. Therefore, our pediatric staff have to get Neonatal Resuscitation Program (NRP) training and certification every three years. In 2016, there were 12 newborns transferred after neonatal resuscitation in our hospital. The transfer rate was high around 60%. Because this high transfer rate cracked our clinical staff's confidence greatly, we wanted to break the passive and perfunctory old thinking that did not actively review and improve NRP operation. Furthermore, adequate and complete resuscitation equipment would be well prepared firstly. Most important of all, we would achieve cooperative team performance of correct, not panic first aid technique to improve healthcare quality and patient-safety. Good cooperative team performance of medical care is the basis of decreasing medical negligence occurred. This project used team resource management (TRM) to set up a professional medical team. We built up a process of information transmission between Obstetric and Pediatric staff through" leadership" and" communication" skills. Using "ISBAR" approach to standardize the form for Obstetric consultation and content on Pediatric shift papers. A well-defined NRP supporting system and duty of member were set up by using" mutual support" and" situation monitoring" approach. On the occasion of renewing NRP and simulation equipment, We also designed many simulation programs according to American heart association 7th edition NRP that our staff could practice NRP handsomely. Through these TRM skills, we further increase the efficiency of cooperative team work and decreased the transfer rate of newborn after neonatal resuscitation.
SS05-08 (17:32-17:44)	Exploring Factors Surrounding Students' Entrepreneurial Intentions in Healthcare Informatics: The Theory of Planning Behavior Perspective **Hao-Yun Kao**, Chin-Yung Hong and Wen-Hsiung Wu Kaohsiung Medical University, Taiwan Abstract---The implementation of entrepreneurship and innovation within the health informatics scientific community is relatively sluggish when compared to other disciplines such as computer science and engineering. The purpose of this paper is to explore the cognitive processes involved in developing intentions to enact entrepreneurial behaviors via exploring entrepreneurial awareness as a significant influence on an individual's intentions to recognize and exploit market opportunities. In this conceptual paper, insights from Ajzen's Theory of Planning Behavior (TPB) coupled with self-efficacy beliefs are utilized to develop hypotheses from our research questions. TPB has often been applied to entrepreneurial

	studies, but for the voluminous body of research devoted to intentions, little has delved into the cognitive processes whereby people develop intentions to entrepreneurial behaviors. Thus, our extended framework can better understand the factors behind entrepreneurial intentions. The research methodology employed by this study involves a closed survey given to approximately 300 undergraduate students at a medical university in Taiwan exploring their beliefs. Our results suggest that measuring self-efficacy beliefs in tandem with attitudes toward entrepreneurship provides a better analytical model based on the TPB. Moreover, the results help understand entrepreneurial intentions specifically applied to the healthcare informatics field which has been under researched. Finally, this study also can guide educators in their efforts to reinforce entrepreneurial behaviors in entrepreneurship education.

Special Session< Healthcare Management and Expenditure Analysis>

Session Chair: Prof. Minig-Chih Chen
Venue: Laboratory for Advanced Research B, Room 0911-2
Time: 16:20-18:00

Note:

*** Each presentation should be 10mins oral pretention + 2 mins Q&A.**

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SS10-01 (16:20-16:32)	A Toolkit for Simulating Medical Data **Jian Li** and Ming-Chih Chen Fu Jen Catholic University,Taiwan Abstract--- Medical data are often expensive and difficult to collect. If we can simulate the data and create model by using a virtual environment before getting all the data, we can reduce costs and increase the quality of products and systems. We developed a toolkit with R which can learn the pattern from the observed data and use the random distribution to simulate the new data set. Especially for clinical trial, it involves the generation of trial outcomes for artificial subjects based on given inputs, data generation models which use these inputs to generate outcome data and the subsequent analysis of the generated dataset.
SS10-03 (16:32-16:44)	Research on DRGs Cost Prediction Model based on TCM Symptom **Xu Wang** and Ming-Chih Chen Fu Jen Catholic University,Taiwan Abstract--- The design and development of the Diagnosis Related Groups (DRGs) began in the late sixties at Yale University. DRGs are a patient classification scheme which provides a means of relating the type of patients a hospital treats to the costs incurred by the hospital, based on the principal diagnosis, secondary diagnoses, surgical procedures, age, sex and discharge status of the patients treated. And in the Chinese mainland and Taiwan, prospective payment rates based on DRGs have been established as the basis of Medicare's hospital reimbursement system. However, we found that most of the current classification of patients only used 5-6 characteristics（or variables）, and the classification method is dominated by decision trees. So the following questions arise: (1) Since each patient is a complex individual (the condition is also complex), to determine the patient reimbursement rate with only 5-6 characteristics is too hasty, especially in the absence of the disease stage and complications; (2) Decision tree method has its drawbacks, and is it appropriate to use decision tree for this

	classification? (3) For Western medicine, it is “the same treatment with the same disease”. But for traditional Chinese medicine, it is generally “different treatment with the same disease”, and the final treatment plan will be determined based on the patient’s symptoms. Treatment costs will also vary. This article intends to analyze the data from a western medicine hospital and a traditional Chinese medicine hospital in mainland China. We hope to increase the classification effect by adding some key variables, and compare these results with multiple classification methods. In addition, this article will tentatively discuss the problems of DRGs in TCM hospitals and provides some basic ideas for TCM research on DRG issues.
SS10-04 (16:44-16:56)	Cost Analysis of Patients with Diabetes and Diabetic Nephropathy in Taiwan Ye-Fei Jiang, **Ming-Chih Chen**, Tian-Shyug Lee and Ben-Chang Shia Fu Jen Catholic university,Taiwan Abstract--- There is very few literature to thoroughly investigate the cost of medical resources and its important influence factors in diabetes and its nephropathy. Based on the unique Taiwan National Health Insurance Database (NHIRD) in this study, we construct the two-part model to find out the pattern of medical cost for the three years inpatient treatment and impact factors. The objective is to provide references for revision of screening content program. Also, the model presented in this study identifies high-risk groups of inpatient treatment, which can provide targeted health care and medical management solutions for this population. We hope the results can help to reduce the burden of medical resources for overall diabetes and dialysis treatment.
SS10-06 (16:56-17:08)	Cross-Sectional Association of Physical Activity and Fitness with Happiness among Older Adults in Taiwan Michael T. S. Lee, Ming-Chih Chen, Chien-chang Ho and **Yi-Tian Lin** Fu Jen Catholic university, Taiwan Abstract--- he present study aimed to determine the relationship of physical activity and fitness with happiness in a well-characterized population of older Taiwanese adults. n this cross-sectional study, we reviewed the data derived from the National Physical Fitness Examination Survey (NPFES) in Taiwan. This survey is conducted by the Sports Administration, Ministry of Education, Taiwan (MOE-SA). A stratified, convenience sampling scheme was performed at 36 physical fitness test stations in 17 cities or counties in Taiwan. A total of 14,437 healthy elderly subjects aged at least 65 years participated in this study between October 2015 and May 2016. Each subject was examined using physical fitness tests and a standardized face-to-face interview. Interviews were conducted at nearby physical fitness test stations by using a structured questionnaire to obtain information on participants’ age, sex, education, monthly income, marital status, sedentary lifestyle, and

	physical activity. Physical fitness was assessed by measuring five physical fitness components: aerobic endurance (2-minute step test), muscle strength and endurance (30-second arm curl and 30-second chair stand tests), flexibility (back scratch and chair sit-and-reach tests), body composition (body mass index [BMI] and waist-to-hip ratio [WHR]), and balance ability (one-leg stance with eyes open and 8-foot up-and-go tests). Logistic regression models were used to estimate the odds ratios (ORs) and 95% confidence interval (CI) to determine the association of physical activity and fitness measurements with higher levels of happiness after adjusting for potential confounders. The volume and intensity of physical activity were associated with higher levels of happiness in healthy older individuals, with the strongest association in individuals with the volume of physical activity. Furthermore, higher levels of happiness were associated with the aerobic endurance (2-minute step test), muscle strength and endurance (30-second arm curl and 30-second chair stand tests), and balance ability (one-leg stance with eyes open and 8-foot up-and-go tests) of older subjects. The results suggest that enhanced volume and intensity of physical activity and fitness levels are independently associated with higher levels of happiness.
SS10-07 (17:08-17:20)	Extracorporeal Membrane Oxygenation Use, Expenditure, and Outcomes in Taiwan **Yu-Chiao Wang** and Michael T. S. Lee Fu Jen Catholic university,Taiwan Abstract--- There are several forms of extracorporeal membrane oxygenation (ECMO), the two most common are veno-arterial (VA) ECMO and veno-venous (VV) ECMO. In both modalities, blood drained from the venous system is oxygenated outside of the body. In VA ECMO, this blood is returned to the arterial system, its major application is for heart function failure or cardiopulmonary failure. Respiratory failure using veno- venous model ECMO. The study objective was to determine veno-arterial ECMO use, expenditure, and outcomes in Taiwan. All adult admissions with post-cardiotomy or cardiogenic shock involving extracorporeal membrane oxygenation were examined by using the Taiwan National Health Insurance Research Database between January 2010 and December 2012. Outcome and resource use (including hospital charges, length of stay, and charges per day) were analyzed. An estimated total of 66 admissions with post-cardiotomy or cardiogenic shock involved extracorporeal membrane oxygenation over the study period. In the post-cardiotomy group, overall length of stay was 12.6±15.5 days, total hospital charges (New Taiwan dollars) averaged $ 728,420±$452,811 per admission, with average charges per day of $151,731±$162,841. In the cardiogenic shock group, overall length of stay was 17.1±15.5 days, total hospital charges averaged $ 705,680±$ 451,876 per admission, with average charges per day of $105,081±$ 121,219. The 1-year survival rates were 15% and 37%,

	respectively. These results suggest that the use of extracorporeal membrane oxygenation due to post-cardiotomy or cardiogenic shock is greater resource use and worse outcomes. It is suggested that Health care payer should regularly review the indications and application timing of extracorporeal membrane oxygenation use to maintain the appropriateness of resource utilization.

Special Session < Medical and Healthcare System Technology>

Session Chair: Prof. Ting-Ying Chien
Venue: Laboratory for Advanced Research B, Room 0913
Time: 16:20-18:00

Note:

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SS11-01 (16:20-16:32)	Use of Group-Based Trajectory Modeling to Explore Patterns of Stroke in Different Gender Groups Ting-Ying Chien, **Mei-Lien Lee, Wan-Ling Wu** and Hsien-Wei Ting Department of Computer Science and Engineering, Yuan Ze University,T aiwan Abstract--- Acute cerebrovascular disease has a high mortality rate and incurs a high medical expenditure, contributed to in particular by the high costs of intensive care and emergency medical treatment. In this study, group-based trajectory modeling was employed to explore the patterns of hospitalization for acute cerebrovascular disease in different groups of patients. The Taiwan National Health Insurance Research Database (NHIRD) was used in this study. Characteristics of acute cerebrovascular disease patients, including age, mortality rate, medical expenditure and total length of stay for each hospitalization were recorded, and trajectory analysis was employed to explore the hospitalization patterns in patients hospitalized more than 4 times and fewer than 8 times. The data were divided into three groups according to medical expenditure, high, middle and low groups, split at the 33rd and the 66th percentile. In total, 676,355 cases were included in this study; 395,945 cases were male patients and 280,410 were female. The results showed that the interval between hospitalizations decreased. In addition, age, mortality rate, medical expenditure and total length of stay differed significantly between the male and female acute cerebrovascular disease patients, and a greater medical expenditure was incurred during each subsequent re-admission. The results of this study showed that the interval between hospitalizations decreased in acute cerebrovascular disease (CVA) patients, and significant differences existed between the male and female patients. They will have the worse condition after the patients received the CVA, and a higher medical expenditure was incurred for re-admission.

SS11-02 (16:32-16:44)	Decision Analysis of Brain Arteriovenous Malformation Treatment **Ting-Ying Chien, Hao-Wei Li** and Hsien-Wei Ting Yuan Ze University，Taiwan Abstract--- Spontaneous intracerebral hemorrhage (sICH) is a serious condition that incurs a high medical expenditure. The most frequent cause of sICH in young adults and children is arteriovenous malformation (AVM). Most cases of AVM are congenital, and there is 4% per year who have sICH attacked since birth. There are two primary methods of treatment: craniotomy with removal of AVM and radiosurgery; in addition, some patients undergo general head surgery with removal of the sICH only. A dataset consisting of inpatient expenditure by admission and a registry of beneficiaries was derived from the Taiwan National Health Insurance Research Database (NHIRD). AVM patients were separated into groups according to the type of surgery they received, which included no surgery, craniotomy, arteriovenous surgery and radiosurgery. In this study, we recorded the characteristics of the AVM patients, including age, medical expenditure and total length of stay, in the different treatment groups, and analyzed the occurrence of first-attack arteriovenous malformation in each age group. In total, 710 person-times were included in this study; 380 person-times were male and 330 were female patients, and 438, 35, 169, 141 person-times were classified into the no surgery, craniotomy, arteriovenous surgery and radiosurgery groups, respectively. The results showed that craniotomy attracted a higher medical expenditure than the other treatments due to room fees. Age, medical expenditure and total length of stay differed significantly between the groups of patients undergoing different types of surgery. This study demonstrated that AVM surgery differs significantly from general head surgery, craniotomy with removal of AVM, and radiosurgery in various ways. Decision-making regarding treatment depends on the condition of the patient. General head surgery incurs the highest medical expenditure, and the patients who underwent radiosurgery were younger than the others.
SS11-03 (16:44-16:56)	Disease Trajectory Visualization System Based on Big Data Analytics **Ting-Ying Chien**, Chong-Yi Chen, **Guo-Lun Jin** and Hsien-Wei Ting Yuan Ze University, Taiwan Abstract--- For health promotion, recognition of risk factors that may modify health needs is necessary, and people then have the opportunity to change their behavior if they are aware of the risk factors. Big data analysis of health data is emerging as a new trend in research that may lead to discovery of unknown facts, and visualization of data is a convenient way in which to understand the characteristics of the data. This study used the National Health

	Insurance Research Database (NHIRD) as the basis to construct a visualization model for disease trajectory analysis. The NHIRD, which includes inpatient expenditure by admission (DD) and ambulatory care expenditure by visit (CD) data, was used in this study. We analyzed the medical care of patients, such as medications, surgery, medical expenditure and total length of stay, and calculated the number of patients who suffered other diseases within the next 6 months, 12 months and 24 months. A Sankey diagram was employed to show the disease trajectory. Based on data analytics, we constructed a system that helps the user to easily understand the disease trajectory. The system includes two panels, a user input panel and an output panel. Using the input panel, the user can input basic information, such as gender, age, date and the queried disease. Based on user input and analytical models, the system will show the detailed trajectory for each queried disease, such as medical expenditure, medications and total length of stay in hospital, and uses Sankey diagrams to show the disease trajectory. This study constructed a visualization system based on analysis of the NHIRD. The Taiwan National Health Insurance Administration, Ministry of Health and Welfare, constructed the Health Bank, which contains health data of all individuals. This method may enable prediction of the risks of diseases in the future.
SS11-04 (16:56-17:08)	The Epidemiology and Cost of Hospital-Treated Traumatic Brain Injuries: a 10-Year Nationwide Survey in Taiwan **Hsien-Wei Ting**, Chien-Lung Chan, Dachen Chu, K. Robert Lai, Nan-Ping Yang, Chun-Chih Liao, Ting Ying Chien and Ren-Hao Pan Taipei Hospital, Ministry of Health and Welfare, Taiwan Abstract--- Traumatic brain injury (TBI) is one of the most common types of injury, especially among young adults. This study used the Taiwan National Health Insurance Research Database to evaluate the incidence and medical cost of TBI in Taiwan. Multi-level logistic regression models were used to assess the correlations between factors. A total of 290,114 subjects were included from 2002 to 2011. The incidence of head injury was around 126.1 cases per 100,000 populations per year. Around 1/3 of TBIs were caused by traffic accidents, and the mortality rate was lower than 4%. The incidences of TBI in males were significantly higher than those in females in all age groups. The average length of stay was 11.53 days. The average total medical cost was $USD 2809.24. The incidence of TBI was significantly higher in subjects aged 25 to 44 years (25.58%) and those aged 45 to 64 years (24.95%). The incidences of TBI vary in hospitals of different levels and in different regions. Acute subdural hematoma (SDH), traumatic subarachnoid hemorrhage (SAH) and traumatic

	intracranial hemorrhage (ICH) have higher severities than other TBIs, especially at the older ages. The male TBI subjects had both a higher incidence and a higher mortality rate than the female subjects in all age groups and TBI groups, with the exception of SAH.
SS11-05 (17:08-17:20)	Healthcare Quality and Efficiency in Taiwan. **Su-Ying Hung** and Tai-Hsi Wu Department of Business Administration, National Taipei University, Taiwan Abstract--- This study constructed a novel performance evaluation system with changed the traditional DEA definition of the resources of medical staffs. It will be closer to the fact and have better performance evaluation. This study used the hospital administrative data from the open data of Minister of Health and Welfare and Bureau of National Health Insurance, 2014, there are 163 hospitals. This study found that there are although there are some performance evaluation system, it still have inconsistent efficacy rate among different levels and districts hospitals. The different hospitals have their own quality improvement focuses. This study found that at least 70% hospitals have relative better performance. The medical cost in hospitals is not only factor of efficacy. Combination of healthcare quality and medical cost will present the real performance.
SS11-06 (17:20-17:32)	Retrieving and Clustering Keywords in Neurosurgery Operation Reports Using Text Mining Techniques Chun-Chih Liao, **Wei-Hsuan Lien**, Furen Xiao, I-Jen Chiang, Jau-MinWong and Ke-Chun Huang Yuan Ze University, Taiwan Abstract--- To develop a more practical and reasonable classication of surgical procedures, we applied text mining techniques to retrieve and categorize keywords in operation reports. Based on neurosurgical operation reports performed in a Taiwan medical center between 2009 and 2012, a corpus containing 3,657 documents was built. A total of 9,906 words were extracted. Initially, we applied term frequency-inverse document frequency (TF-IDF) weighting to automatically select pertinent keywords but the results were unsatisfactory. Then, we manually chose 45 keywords that belong to 3 categories: brain, spine and others. All documents were checked in an automated fashion for the presence of these keywords, producing a binary data matrix, which was used to compute the cosine similarity matrix. Then, we applied 6 variants of agglomerative clustering to build the dendrograms. The document frequencies (DFs) of these 45 keywords ranged from 12 to 1,250, with an

	average of 444342. The number of distinctive keywords per document ranged from 0-15, with an average of 5.52.5. The similarities between DF vectors are higher between keywords in the same category (brain or spine). The shortest link method and the unweighted pair-group method using the centroid (UPGMC) methods performed best on external and internal evaluation, respectively. The distributions of important keywords in neurosurgery operation reports reveal the localized nature of surgical procedures.

Session < Medical Image Processing>

Session Chair: Prof. Leyi Wei

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Special Session < User Experience Based Service Innovation in Healthcare Management>

Session Chair: Prof. Kuo-Yi Lin

Venue: Laboratory for Advanced Research B, Room 1001
Time: 16:20-18:00

Note:

*** Each presentation should be 10mins oral pretention + 2 mins Q&A.**

*** The certification of the best oral presentation will be awarded at the end of the conference at the closing ceremony.**

***To show the respect to other authors, especially to encourage the student authors, we strongly suggest you attend the whole session, the scheduled time for presentations might be changed due to unexpected situations, please come as early as you could.**

I0028 (16:20-16:32)	Augmented Reality for Supporting Real Time Telementoring: An Exploratory Study Applied to Ultrasonography **Mauro Del Rio**, Vittorio Meloni, Francesca Frexia, Francesco Cabras, Roberto Tumbarello, Sabrina Montis, Andrea Marini and Gianluigi Zanetti Center for Advanced Studies, Research and Development in Sardinia(CRS4), Italy Abstract--- Telementoring is a real time telemedicine modality that allows a specialist to remotely assist a less expert operator. Videoconferencing is the main means for implementing telementoring applications and has been used in a wide range of clinical disciplines. Long-distance communication can be affected by misunderstanding and misinterpretation, in particular when dealing with remote guidance. Videoconferencing can be enhanced using Augmented Reality (AR), which enriches video feeds with virtual objects like 3D models, pointers and annotations. To evaluate through an exploratory study the impact of AR in remotely assisted ultrasound exams. In previous studies we developed a real time telementoring system (CRS4-TELEMED) for allowing a specialist to remotely guide the execution of an echocardiographic exam by an operator. The system manages three streams: the video from an IP cam, showing the exam scene; the sonographic video from the ultrasound machine; the bidirectional audio for allowing communication between the specialist and the operator. The system has been extended with a set of virtual telepointers, superimposed on the sonographic video and the keyboard of the ultrasound machine, in order to allow the remote specialist, which uses an

	Android tablet, to indicate regions of interests. The local operator wears Android smartglasses (Epson Moverio bt-200) that enable optical see through visualization of pointers. ARToolkit was used for implementing marker based AR Preliminary tests were conducted at the Pediatric Cardiology department of AOU Brotzu in Cagliari. Doctors and nurses with different skills and experience in ultrasound exams were involved. Participants judged the system positively, considering AR telepointers useful for improving remote assistance. The following issues emerged: optical alignment is suboptimal, some training is required to understand how smartglasses and AR work, smartglasses results uncomfortable, especially if the user wears glasses. AR based telepointers can be used for improving telementoring, allowing a remote specialist to indicate region of interests. Issues like comfort and alignment precision can be overcome with future evolution of smartglasses. Future works include: new pointers for indicating region on the patients and how to use the ultrasound probe; a user friendly in app calibration procedure for increasing AR precision on smartglasses; a field testing for evaluating the system.
I0036 (16:32-16:44)	CARS (Circumcision Augmented Reality Simulation): An Augmented Reality Application for Circumcision Simulation Hariyono Winarto, **Muhammad Sobri Maulana** and Gassani Amalia Universitas Indonesia, Indonesia Abstract--- As one of the most common minor surgical procedure performed globally, male circumcision has some complications when performed by medically trained providers and non-medically trained providers. Presently, there is no standardized circumcision training approach and there have been variable resources and materials used. We constructed a low-cost and mobile circumcision training application augmented reality called Circumcision Augmented Reality Simulation (CARS). CARS is built in a computer with minimum processor 4Ghz (RAM 4GB, VGA 2GB) and smartphone with Blender, Inkscape, Audacity and Unity3D software. Features that are provided in CARS including 3D models, animation and sound of circumcision procedure. CARS was tested through several steps including black box technique, response time loading and layer resolution examination. The trial is also done with various smartphones. The angles detected ranging from 20o-90o, with maximum distance of 4 m using markers measuring 20x22 cm. Based on the percentage of enclosed barrier, marker can be detected between 0-90 percent. CARS as an example of augmented reality application for surgery simulation has been successfully built with features performing circumcision simulation and suitable for potential users (medical students and doctors). Implications for future research include assessing reliability and validity by growing its use to broader population creating another surgery procedure simulation with augmented reality technology.

I0153 (16:44-16:56)	Interactive Augmented Live Virtual Reality Streaming: A Healthcare Application **Chia-Chi Teng**, Nathan Jensen, Timothy Smith,Talon Forbush, Kyle Fletcher and Michael Hoover Brigham Young University, USA Abstract--- Virtual Reality (VR) technology has been around for decades; however, we have probably only begun to realize the practical applications until recent years. With increase of computing power, decrease of cost and physical dimension, a new class of consumer grade VR devices such as Oculus Rift and HTC Vive has made adopting VR technology more affordable and feasible than ever before. In addition, Augmented and Mixed Reality (AR/MR) devices such as HoloLens and Magic Leap have opened up possibilities for even more applications. Health care is one area where many resources are dedicated to research and development of potential VR/AR/MR applications for many years. We propose an interactive system of live 360-degree video streaming to VR devices with the capability to augment the experience with virtual content, to be used in a telemedicine setting.
I0144 (16:56-17:08)	Application of Neural-Network Techniques to Analyze the Common Key Factors of Using CT and MRT in Hospitals **Chien-Chih Wang** and Hsiu-Chuan Yen Ming Chi University of Technology, Taiwan Abstract--- According to healthcare institute report statistics released by the Bureau of National Health Insurance, the number of CT or MRI examinations used in 1999 exceeded 850,000, an increase of 14.18%. So far, the growth rate has not slowed down, and the number is significantly higher than other advanced countries. Understanding the increase in equipment growth rate is very important for the allocation of hospital resources. A neural-network technique was used to find out that hospitals have critical common factors for CT and MRI. A database of specific Hospital in Taiwan as an example, the results showed that the number of surgical and crude deaths, the number of physical and surgical visits were the factors that affected the hospital's possession of CT. The number of chronic general hospital beds and expensive medical equipment is the common influence factor for CT and MRI in the hospital. The results of this study can provide reference guidelines for hospitals and related institutions when evaluating and reviewing CT and MRI acquisitions.
I0043 (17:08-17:20)	Elderly Fall Risk Evaluation through Deep Learning of Inertial Sensor Data Collected from 3M TUG Test **Tien-Lung Sun**, Tomas Mendoza, Chien-Hua Huang, Chia-Hsuan Lee and Victor Ham Choi Yuan-Ze University, Taiwan

	Abstract--- In recent years, with the new developments in miniaturization of electronics, it is desirable to create low-cost and easy-to-use assessment techniques that could be applied at home or community centers to achieve early detection and therefore, prevention of falls. Due to the low-cost, small size and easy-to-use characteristics, wearable inertial sensors have become a viable technology for fall risk assessment. Previous research for fall risk evaluation from inertial sensor data focused on the 'feature-based' approach, in which important handcrafted features were extracted from time series data to evaluate falling behaviors. With new advances in deep learning (DL) algorithms, the need for engineered features might be eliminated by applying DL algorithms to automatically extract abstract representations or features from the sequential time series data recorded by the inertial sensors. In our study, we employed a deep learning based approach to learn fall risk behaviors from accelerometer data obtained from 3 meter Timed-Up and Go (3M-TUG) test. One hundred and fifty community-dwelling elderly aged 65 years were recruited and their 3M-TUG performance were measured by a wireless tri-axial accelerometer system on a belt worn around the waist. The Short Form Berg Balance Scale (BBS) score is used to label the balance ability of the elderly subjects. The input time series were first filtered by Butterworth low-pass filter to remove noises. The filtered data was then manually cut into four segments: sit-to-walk (STW), walk, turn, walk-to-sit (WTS). Four types of input time series were prepared: whole 3M-TUG data, whole 3M-TUG data with low-pass filter applied, segmented data (STW, walk, turn, WTS), segmented data with low-pass filter applied. These time series were then used in three deep learning neural networks, i.e., Multi-layer Perceptron (MLP), Convolutional Neural Network (CNN), and Recurrent Neural Network with Long Short-Term Memory (RNN-LSTM). The research work is still in process and we will report the classification performance of these three DL models on four input data formats, under two training strategies, i.e., cross-validation and leave-one-out.
Session 4 Ends Special Session 3 Starts	
SS03-01 (17:20-17:32)	Evaluative Framework for Interactive Sensory and Emotional Design: Health Care Reminder on Computer Sedentary Groups **Sheng-Chih, Chen** and Shin-Tsz, Chen National ChengChi University, Taiwan Abstract--- This study proposes the concept of "interactive mechanism" to improve the "reminder" of the "sedentary group" in the current market. Such interactive mechanism is endowed with the function of "reminder of health care" that features "instantaneous interaction" and "warm reminder" that remind the sedentary group in a clearly simple manner, so that they know when to leave the seat within the shortest period of time. Eventually this concept is materialized as the prototype of "interactive light box" that creates proper atmosphere with the light of external context to enhance the experience. In addition, the development of mobile phone applications shatters the shackles of space for portable use. According to or expected goals, all these three interactive devices can remind their users

	despite the different reminder intensity. The observation and interview in experiment confirm the three major problems to tackle, such as the “inconvenience of artificial setting” solved by the concept of interactive mechanism proposed in this research. Such solution is based on the instantaneous interaction that spares users setting the period of time from the beginning to end. In doing so users can act as what they do in daily life, which overcomes the “restriction of time setting”. In addition, thanks to the reminder through visualized light, the conversion of images in mobile phone and its portability, the mechanism is free of the restriction imposed by sites in which sound is not allowed. The key to this solution lies in the visual distraction. Besides, the image of a boy in mobile phone makes the mechanism more narrative so that the curiosity of users can be sparked by the empathy and emotions shared by all human beings as well as the feedback given by interviewees. In doing so the goal of emotional experience is achieved.
SS03-04 (17:32-17:44)	User Experience Sharing System to Enhance Customer Satisfaction **Kuo-Yi Lin**, Jessica Su, I-Tien Chu and Hsiao-Ling Wu Asia University, Taiwan Abstract--- With the progress of the medical technology development, people gradually improve the definition of medical beauty industry that leading to the rise of the medical market. The atmosphere through different sources of information and the growing channels of communication, consumer acceptance is also increasing. However, the risk and commitment is the top priority elements when consumers face the services of the medical beauty industry. Based on the experience-sharing platform of the medical users, this study based on the business intelligence and the UNISON decision-making analysis framework to construct the medical beauty user experience-sharing platform to improve customer satisfaction. The business intelligence gathers, stores, analyzes and calculates the relevant user data, and then uses the type of user's demand. The results are presented to the user, manager or knowledge worker, for business to take effective action to improve the business performance or to help them make better decisions; and decision analysis framework. The proposed framework consists (1) understand the problem , (2) defining a niche, (3) structure influence, (4) objective description, (5) subjective measurement, (6) and the decision the needs of the medical beauty. This study collect the empathy and perspective of the user experience in the user's perspective, and then introduce the medical user experience sharing platform. This study introduced the background information, the user feedback information and then follow-up analysis to understand the user's preferences and feelings the consumer for this non-invasive medical beauty way. The information provides ways to improve asymmetry problems and enhance customer satisfaction. The result provides ways to market research to explore business opportunities in the medical beauty industry.

Special Session < Complementary and Integrative Medicine in Health Care Sysytem>

Session Chair: Dr. Tse-Hung Huang

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Special Session < Intelligent Systems and Applications for Clinical and Patient Information>

Session Chair: Prof. Chi-Hua Tung

Venue: Laboratory for Advanced Research B, Room 1014
Time: 16:20-18:00

Note:

*** Each presentation should be 10mins oral pretention + 2 mins Q&A.**

*** The certification of the best oral presentation will be awarded at the end of the conference at the closing ceremony.**

***To show the respect to other authors, especially to encourage the student authors, we strongly suggest you attend the whole session, the scheduled time for presentations might be changed due to unexpected situations, please come as early as you could.**

SS04-01 (16:20-16:32)	The Risk Factors of Needle Sickness During Acupuncture **Chiung-Hsin Chang** and Tse-Hung Huang Department of Internal Medicine, Chang Gung Memorial Hospital, Taiwan Abstract--- Acupuncture is used for diverse diseases currently. “Faint during acupuncture”, or “needle sickness”, is a common adverse reaction of acupuncture. However, there are few researches discussing about the risk factors and the evaluation of needle sickness. This retrospective, case-controlled study utilized the methods of epidemiology and phone interviews to study for the association between the potential risk factors and needle sickness. Phone interviews with the participants were conducted for questionnaires to define the potential risk factors of needle sickness, including mental, physical, environmental, and iatrogenic factors. The result showed that 39 patients and 43 episodes of needle sickness occurred in 9626 person-time acupuncture treatments. The incidence of needle sickness is 0.4%; 55.8% of the subjects were male, while 44.2% were female. The average age of patients with needle sickness is 55.2 years of age, ranged from 17 to 84. The multi-variate analysis and Logistic regression showed that the psychological factors, position, and the physical condition during acupuncture are significantly associated with needle sickness ($p<0.1$). The risk factors of needle sickness include emotion, pain, hunger during the acupuncture, and

	seated position. Avoid these risk factors may reduce the incidence of needle sickness during acupuncture.
SS04-02 (16:32-16:44)	The Beneficial Effects of Moxibustion on the Overweight Adolescent Girls **Yuan-Chieh Yeh**, Hsin-Ning Chang and Tse-Hung Huang Chang Gung Memorial Hospital,Taiwan Abstract--- Overweight in adolescent is considered a major health issue worldwide since it is a strong connection with varies diseases. Among young girls, being overweight or obese is also involved both physically and psychologically. We conducted a randomized controlled trial using moxa burner as moxibustion intervention compared with a control group. 54 eligible participants aged 15-18 with a BMI greater than 25.3 were enrolled, and were randomly allocated equally to treatment group (N = 27) and control group (N = 27). Sessions took place three times a week for 8 weeks (a total of 24 treatments). The moxibustion was applied to acupoints at RN12, RN6, ST25, ST36 and SP6. The physical assessments included changes in the body mass index (BMI), waist to hip ratio (WHR), and body fat ratio (BFR). The psychological outcomes was measured by Rosenberg Self-esteem Scale (RSE). All data were collected in the beginning of the study (baseline), week 4, and week 8. Of the 54 randomly assigned participants, 46 completed the trial. The BMI changes from baseline between treatment group and control group was 0.097 ($p = 0.655$) at week 4, and -0.794 ($p = 0.001$) at week 8. A significant decrease in WHR after 4 weeks intervention was observed in the treatment group compared to control group, with a -0.011 ($p = 0.017$) mean change from baseline, and a -0.035 ($p <0.001$) mean change from baseline at the end of week 8. On the other hand, the treatment group had a slightly decrease BFR of -0.253 ($p = 0.474$) mean change from baseline at week 4, and a significant change of -2.068 ($p < 0.001$) from baseline compare to control group was observed at the end of week 8. In the psychological assessment, the score of RSE showed a slightly increase of 0.155 points ($p = 0.803$) at week 4, and a significant improvement of 1.606 points ($p = 0.021$) than the improvement in the control group at week 8. No obvious adverse effect was reported during the entire 8 weeks intervention. To sum up, moxibustion is an effective and safe intervention for overweight adolescent girls to benefit both physically and psychologically.
SS04-07 (16:44-16:56)	Is Acupuncture Effective and Safe for the Treatment of Breast Cancer-related Lymphedema? A Narrative and Systematic Review **Tse-Hung Huang** and Chun-Wei Chen Chang Gung Memorial Hospital, Taiwan Abstract--- Breast cancer related lymphedema (BCRL) is a common side effect in breast cancer survivors that can cause many physical and psychological morbidities. Acupuncture may be effective. The aim of this study was to review the available literature to determine the

	efficacy and safety of acupuncture for women with BCRL. A narrative review was compiled after searching the electronic databases using PubMed, MEDLINE, Google Scholar, Cochrane Database and CNKI. Randomized controlled trials and non-controlled case series were included. The study includes 6 single arm studies and 3 randomized controlled trials. All studies demonstrated subjective improvement in well-being, quality of life as well as some symptoms relief, and some reported objective improvement in ROM of joint, arm circumference and degree of lymphedema. Notably, some trials showed feasibility and safety in acupuncture treating BCRL. Our review has many important limitations, including too small sample size, the presence of poor controls or no controls, poor randomization and lack of blinding. Despite some limitations, these clinical trials still demonstrate some objective and subjective improvement. In addition, acupuncture is safe, low cost and convenient. It might be an option for patients for alternative and complementary treatment. Further well-designed studies are required to confirm the definite conclusion.
Special Session 4 Ends Special Session 9 Starts	
SS09-01 (16:56-17:08)	Efficacy and Safety of Exenatide Versus Insulin in Type 2 Diabetes Mellitus: Systematic Review and Meta-Analysis Bao-Ju Chen, Ju Chuko, **Chi-Hua Tung** and Kuang-Yu Hu Chung-Hua University, Taiwan Abstract--- OBJECTIVE Exenatide is a new class of medications (incretin mimetic) for the treatment of type 2 diabetes mellitus approved at 2005-Apr by U.S. Food and Drug Administration. We provided a systematic review and meta-analysis of exenatide therapy compared to both placebo and insulin therapy on main efficacy parameters and safety. RESEARCH DESIGN AND METHODS In this meta-analysis, we searched PubMed (from June 2003 to July 2010) on randomized controlled clinical studies of at least 12 weeks' duration in type 2 diabetes mellitus. RESULTS Exenatide reduced the mean differences of HbA1c comparing with both placebo (-0.88% [95% CI -0.98 to -0.79]) and insulin (0.05% [95% CI -0.11 to 0.21]). And, mean differences of body weight were reduced for exenatide comparing with both placebo (-1.18 kg [95% CI -1.44 to -0.93]) and insulin (-5.42 kg [95% CI -5.89 to -4.95]). CONCLUSIONS Exenatide has beneficial effects on glycemic control and relatively safe in regard to the adverse events studied. The effect of glycemic control of exenatide and insulin are similar, but body weight reduction of exenatide is more efficient. This indicates that exenatide provides another choice for type 2 DM patients who have weight control problems.
SS09-02 (17:08-17:20)	BreastExtractor: A Word/Phrase Matching-Based Text Mining Program for Automatic Extraction of Hormone Receptor Data from Free-text Pathology Reports on Breast Cancer **Kai-Po Chang**, Chi-Chang Chang, Yen-Wei Chu and John Wang

	National Chung Hsing University,Taiwan Abstract--- Estrogen receptor (ER), progesterone receptor (PR), and HER-2 status, as determined by immunohistochemistry (IHC), are important in the treatment of breast cancer. Therefore, statistics on the ER, PR and Her-2 IHC results serve as important quality indicators in surgical pathology laboratories. To replace the time-consuming manual method for accessing these data, a text-mining program was designed. The authors developed a Python script utilizing simple word/phrase matching of the common patterns that pathologists use when they express immunohistochemical data. The program was then tested on 54,080 pathology reports exported from a single institution, and achieved an overall sensitivity of 98.5%, 98.5% and 98.9% for ER, PR and Her-2 result extraction, respectively, and specificity of 100% in all items. The program runs on a personal computer at an acceptable speed. Based on these results, it can be concluded that, if combined with an appropriate clinical context, data mining of ER, PR and Her-2 immunohistochemical results can be achieved to an acceptable sensitivity, without using advanced natural language processing (NLP) algorithms.
SS09-03 (17:20-17:32)	Standardized Automated Patient Movement Analysis Training System **Chih-Hao Lin**, Shih-Nung Chen and Rong-Chi Chang Asia University, Taiwan Abstract--- A good doctor must do a deep understanding of the needs of patients. Doctors must listen into the patient illnesses overview, as well as to understand the cause of the patient based on the patient's background. In recent years, the major of Medicine have to import "standardized patients (SP)" courses. Out of the program, practical experience, and quickly determine the SP is urgently needed resources to treatment. In this research, the main use of the Kinect device to detect the SP in performing the action is consistent performances. Use of SP script This device records all joint action performances circumstances, further analysis of previous SP to participate in the screenplay. Each practice will be recorded this way to achieve the goal of each performance consistently. When the formal performance, not because of lack of practice, no guidance caused in performances on SP error or script misunderstanding. This system allows SP when performing a full practice, to avoid the error cause unable to in line with the theme of the performances.
SS09-04 (17:32-17:44)	Risk of Acute Pancreatitis in Type 2 Diabetic Patients Treated with Sitagliptin: A Population-based Study **Yu-Ching Chen**, Hsueh-Ting Chu, Victor C. Kok and Jeffrey J. P. Tsai Asia University, Taiwan Abstract--- This study evaluated the incidence of acute pancreatitis (AP) in type 2 diabetic

	patients who received sitagliptin, a dipeptidyl peptidase-4 (DPP4) inhibitor. It was a retro-prospective cohort study, and the electronic medical data was collected from Taiwan National Health Insurance Research Database (NHIRD). There were 56,704 participants enrolled from 3/1/2009 to 12/31/2011. Then propensity score (PS) matching was performed as 1:1 ratio based on treatment group, and age, gender, Charlson comorbidity index (CCI), risk factors of AP, hypoglycemic drugs, hypolipidemic drugs, and socio-economic background were also considered. Hence, 12,642 subjects were identified in each group during a median follow-up time of 4.64 years. Later, 101 and 137 AP events were founded in sitagliptin group and non-sitagliptin group, respectively. After statistical correction for potential confounders, the adjusted hazard ratio (HR) in sitagliptin group was 0.68 and 95% confidence interval (CI) was 0.52-0.88 ($P<0.05$) relative to nonusers. Further, adjusted HR with respect to different cumulative defined daily doses (DDD) were 0.99 (95% CI: 0.60-1.62), 1.01 (95% CI: 0.53-1.92), 0.86 (95% CI: 0.62-1.19), 0.45 (95% CI: 0.26-0.76) and 0.29 (95% CI: 0.14-0.59) for 1 to 30 DDD, >30-60 DDD, >60-365 DDD, >365-730 DDD, and >730 DDD relative to nonusers. In conclusion, there might have a negative association between AP and sitagipltin when cumulative DDD excess one year. It was more obviously when cumulative DDD increased.

Poster Session

Session Chair: Dr. Tse-Hung Huang, Prof. Tian-Fu Lee and Prof. Fong-Jung Yu
Venue: Laboratory for Advanced Research B, 1F Hall Way
Time: 12:00-14:00

I0011	Development of a Smart Drainage Control System Using Support Vector Regression **Hsueh-Yi Lu** and Lu-Ting Kuo Yunlin University of Science and Technology
I0047	Development of a Flexible Imaging Data Integration Tool for Multicenter Clinical Trials **Jingyi Sh**i, Jeff Carr and Yaorong Ge University of North Carolina at Charlotte, US
I0140	Implementing an Image Sharing Platform for the Purpose of Continuity of Care, a Nation's Experience **Swee Jin Mok**, Ramesh Misra and Patrick Chia Integrated Health Information Systems (IHIS) Pte Ltd, Singapore
I0141	Protein Secondary Structure Prediction from Amino Acid Sequence Using Artificial Neural Network Jaehee Hong, Dongwoo Kim, Hyeokjun Kwon and Taeseon Yoon Hankuk Academy of Foreign Studies, Republic of Korea
I0148	The Development of an Aggregated Electronic Health Record in Compliance with Consolidated Clinical Document Architecture **Yujuan Shang**, Lei Wang, Moye Yu, Jiancheng Dong, Huiqun Wu and Kui Jiang Department of Medical Informatics Medical School of Nantong University,China
I0155	A Review on Bone Grafting, Bone Substitutes and Bone Tissue Engineering **Kasun Gayashan Samarawickrama** University of Moratuwa, Katubedda, Colombo, Sri Lanka
I0159	Numerical simulation study on flow field microenvironment of chondrocytes in articular cartilage defect repair area **Xige Ma** and Haiying Liu

	Tianjin University of Technology, China
SS03-02	An Approach to Design A service system of Eevidence-based Medicine: A Symbolic Interactionism Perspective Wen-Hong Chiu, Hui-Ru Chiand and Hsin-Yao Huang Asia University，Taiwan
SS04-03	Empirical Study on the Health Literacy Condition of a University in Jiangsu, China Xinmeng Ye and Ze Tian Hohai University, China
I0020	Risk Factors of Neonatal Mortality Incidence in Muna Regency in 2014 Adra Yudrika, Andi Zulkifli and Masyita Muis Hasanuddin University, Indonesia
I0021	Effect of Fe and Zine Through Fortified Rice Provision on Blood Profile in Students of Annyhayah Islamic Borarding School Karawang Afriani, Abdul Razak Thaha, Rahmadanih Hasanuddin University, Indonesia
I0058	Drug Adherence with Hypertension Status at the Bajoe Community Health Centre of Bone Regency in 2016 Hardiyanti, Ridwan M. Thaha and Syamsiar S Russeng Hasanuddin University, Indonesia
I0061	A Spatial Analysis of Malaria Cases Using Geographic Information System (Gis) Application in Gorontalo Regency in 2016 Iswan Ahmad, A. Arsunan Arsin and Ridwan M. Thaha Hasanuddin University, Indonesia
I0062	Survival of Lung Cancer Patients in Dr Wahidin Sudirohusodo Hospital Makassar 2012-2016 Itma Annah, Itma Annah and Itma Annah Hasanuddin University, Indonesia
I0063	Survival Analysis of Chronic Renal Failure Patients Undergoing Hemodialysis at Hospital in Makassar within 2012-2015

	Iva Hardi Yanti, Ida Leida Maria and Nurhaedar Jafar Hasanuddin University, Indonesia
I0064	Treatment Response Analysis in Patients with Multidrug Resistant Tuberculosis (Mdr Tb) at Labuang Baji Public Hospital in Makassar City Muliati, Ida Leida Maria and H. Muh. Syafar Hasanuddin University, Indonesia
I0109	Kidney Disease with Metabolic Syndrome Risk Factor Using Dynamic Model Approach in Indonesia Mesri Kartika, Nurhaedar Jafar and Anwar Mallongi Hasanuddin University, Indonesia
I0166	Study on the Classification Problem of Coping Stances in the Satir Model Based on Machine Learning Xi Wang, Yu Zhao, Guanping Zeng and Zhiliang Wang University of Science and Technology Beijing, China
I0174	Algorithm for Split Feasibility Problems with Applications to Image Deburring Problems Yeong-Cheng Liou Kaohsiung Medical University, Taiwan
M0023	A Health System for Managing the Use of Antibacterials Tanghai Liu Wuhan No.1 Hospital，China
M2002	Practice of Implementing Standardized Nursing Management in a University Hospital Xiaowen Wang University Hospital, University of Jinan, Jinan 250022, P. R. China
M4001	Factors Associated with Turnover Intention of Nurses in IBNU Sina Yw-Umi Hospital Makassar in 2016 A.Yukyandhika. AH, H. Amran Razak, Ansariadi Hasanuddin University, Indonesia

M4002	Factors Related of Work Environment on Officials Work Satidfication of Health Centers in Keerom Regency Papua Province in 2016 Agustiana Kaikatuy, Syahrir A. Pasinringi and Nurhaedar Jafar Hasanuddin University, Indonesia
M4003	Dynamic System Modeling in Estimating Prevalence of Undernutrition and Malnutrition in South Sulawest Andi Nur Utami, Ridwan A, H. M. Tahir Abdullah Hasanuddin University, Indonesia
M4004	The Effect of Giving Barusa Kacang Gude on The Body Weight, The Upper ARM Circumference, and The Total Protein Concentration of Elementeary Schoole Students with Malnutrition in Bonto Ramba SUB District, Jeneponto Regency Chairul Amal Muthalib, Suryani As'ad, Citrakesumasari Hasanuddin University, Indonesia
M4005	The Quality of Antenatal Care in Integrated Service Post of Urban and Rural Areas of Jeneponto Regency in 2016 Andi Nurfaidah, Ansariadi and Suriah Hasanuddin University, Indonesia
M4006	Risk Analysis Toxic Materials Borax and Rhodamine- B in Snack Against Primary School Children's Health in Housing Area of Tamalanrea Permai Makassar Andi Veny Kurniawan, Anwar Daud and Anwar Daud Hasanuddin University, Indonesia
M4010	The Quality of Life (QoL) of Young Adult Hypertension Patients Undergoing Treatment in Hospitals of Makassar City Nurfaizin Yunus, Ida Leida Maria and Hj. Syamsiar S. Russeng Hasanuddin University, Indonesia
M4011	Quality of Antenatal Care at Rural and Urban Primary Health Centre in Jeneponto Regency Nurul Fauziah, Ansariadi and Darmawansyah Hasanuddin University, Indonesia
	The Effect of Purple Sweet Potates and Sting Ray Treatments On The Nutritional Status of

M4012	The Babies Aged 6-11 Months In Pattallassang Health Center, Takalar Regency In 2015 Nurul Ulfiana Sahlan, Burhanuddin Bahar and Burhanuddin Bahar Hasanuddin University, Indonesia
M4013	Relationship Analysis between Staphylococcus and Pseudomonas Bacteria in Air and Nosocomial Infection Incident Potential in Intensive Care Unit Room of Dr. Wahidin Sudirohusodo Central General Hospital Owildan Wisudawan B, Anwar Daud and Atjo Wahyu Hasanuddin University, Indonesia
M4014	Analysis of Indoor Air Quality with Lung Capacity of the Residents Living on Abdullah Daeng Sirua Street of Makassar Putri Nur Rahmah, Anwar Daud and VeniHadju Hasanuddin University, Indonesia
M4016	Relationship between Hormonal Contraception Uses with Age of Menopause among Elderly at Posyandu Sidodadi Village Wonomulyo Subdistrict Polewali Mandar District Raodah, Masni and Ridwan M.Thaha Hasanuddin University, Indonesia
M4017	The Effect of Doctors-Patients' Verbal and Nonverbal Communication on Patients' Satisfaction in Outpatient Installation of Mother and Child Centre RS Dr. Wahidin Sudirohusodo Makassar Ratna Dewi Artati, Syahrir A. Pasinringi and Nurhaedar Jafar Hasanuddin University, Indonesia
M4018	Relationship between Women Empowerment and the Use of Contraception in Pasarwajo Distric of Buton Regency Wa Ode Dita Arliana, Masni and Anwar Daud Hasanuddin University, Indonesia
M4019	Influence Factors on Blood Glucose Level of Diabetes Mellitus Patients in Makassar Yulinar Fitria Firdiani, Andi Zulkifli and Mappeaty Nyorong Hasanuddin University, Indonesia
M4020	Quality of Antenatal Care at Community Health Centers and Midwifery Practitioner in Jeneponto

	Zhanaz Tasya, Ansariadi and Ridwan M.Thaha Hasanuddin University, Indonesia
M4021	Related Factors to the Performance of Cadres of Larva Monitoring and Health Workers in the Control of Dengue High Fever (DHF) in Palopo Khadijah Maulindah, Sukri Palutturi and Syamsiar S Russeng Hasanuddin University, Indonesia
M4022	Brand Equity Effect on Service Reutilization Interest of Inpatient Installation of Ibnu Sina Hospital, Makassar in 2015 Sumarni Karurukan Andi Gali, Fridawaty Rivai and Ridwan Hasanuddin University, Indonesia
M4023	Correlation Between the Life Style, Stress, and Leptin Level and the Obesity Status in Teachers of the State Secondary Schools in Makassar City Akhir Purwati, Veni Hadju and H. M. Tahir Abdullah Hasanuddin University, Indonesia
M4024	Factors Affecting the Cultural Maturity of the Patient Safety on Medical and Paramedical Officers in Dr, Abdul Rivai, Local General Hospital in Berau Regency, East Kalimantan Province 2016 Nurlaila, Syahrir A. Pasinringi and Andi Zulkifli A Hasanuddin University, Indonesia
M4025	Analysis of the Environmental Factors and the Efforts of the Community to Avoid the Mosquito Bites Against the Endemic Dengue in Rappocini Sub-District, Makassar City Muh. Kahfi, Hasanuddin Ishak, Ridwan M. Thaha Hasanuddin University, Indonesia
M4026	Correlation between Life Style and Dyslipidemia with Impaired Fasting Blood Sugar in State Junior High School and State Senior High School Having Central Obesity Ijah Rahayu, Veni Hadju and Ridwan M. Thaha Hasanuddin University, Indonesia
M4027	Correlation between the Exslusive Breastfeeding and the Duration of the Amenorhoe Lactation at the Work Region of North Galesong Community Health Center

	Anisa Fitrianti, Syahrir A. Pasinringi and Nurhaedar Jafar Hasanuddin University, Indonesia
M4028	Correlation between Nutritional Behavior and Lipid Profile and Fasting Blood Sugar of State secondary school Teachers Having Central Obesity in Makassar City Nikmah Saro, Veni Hadju and Atjo Wahyu Hasanuddin University, Indonesia
M4030	An Analysis of the Mine Dust Exposure Risk and Other Risks for Tuberculosis Suspects among the Workers of the People'S Gold Mine in Poboya Village, Palu City Dilla Srikandi Syahadat, Ida Leida Maria and Anwar Hasanuddin University, Indonesia
M4031	Quality of Life of Chronic Renal Failure Patients before and after Hemodialysis Treatment in Hospital Undata and Hospital Anutapura Palu in 2016 Fitri Yanti Usman Heba, Ridwan Amiruddin and Alimin Maidin Hasanuddin University, Indonesia
M4033	Analysis of the Factor Causing the Medication Error in the Process of Medicine Administration of the Patients at the Adult in-Care Room of Sangatta Regional General Hospital Gunani, Syahrir A. Pasinringi and Noer Bahry Noor Hasanuddin University, Indonesia
M4034	The Analysis Service Quality Based on Patient Expectation and Assessment at Mamuju Regency Local Public Hospital 2016 Hadijah Tuami, A. Indahwaty Sidin and Andi Zulkifli Hasanuddin University, Indonesia
M4035	Counseling Quality of Danger Signs Pregnancy in Work Region or Rural and Urban Primary Health Center District Jeneponto Hafidah Amiruddin, Ansariadi and Sukri Palutri Hasanuddin University, Indonesia
	The Spatial Pattern and Risking Factors of Leprosy Incident in Barru Regency in 2013-2015

M4036	Handayani, Anwar and Muh. Tahir Abdullah Hasanuddin University, Indonesia
M4037	Risk Factors of the Occurance of Decompression Sickness among Fishermen Community to Traditional Divers of Saponda Island Konawe Regency Southeast Sulawesi Province in 2016 Jusmawati, A. Arsunan Arsin and Furqaan Naiem Hasanuddin University, Indonesia
M4039	Correlation between Life Style and Dyslipidemia of Teacher Secondary School with Central Obesity in Makassar City 2016 Masdiana, Burhanuddin Bahar and Masni Hasanuddin University, Indonesia
M4040	Association of Nutritional Status with Anemia on Malaria Patient with Dihydroartemisinin Pipperaquine Treatment in Southwest Sumba 2015 Renni Meliahsari, Nurpudji A. Taslim and Citrakesumasari Hasanuddin University, Indonesia
M4041	Survival of Breast Cancer Patients in Several Hospitals of Makassar City 2012-2016 Sarmila,Nur Nasry Noor and Suriah Hasanuddin University, Indonesia
M4042	Spatial Pattern and Risking Factors of Tuberculosis Disease Occurrence in Barru Regency Satriani, Anwar and Suriah Hasanuddin University, Indonesia
M4045	Relationship of Exposure of Air Pollution in House with Occurrence of Acute Respiratory Infections in Children under Five at Puskesmas Malimongan Baru in 2016 Nur Indahsari, Nur Nasry Noor and Dian Sidik Arsyad Hasanuddin University, Indonesia
M4046	Correlative Factors on Type 2 Diabetes Prevention Efforts of the Senior High School Students in Makassar Ade Pratiwi Muslimin, Ida Leida M. Thaha and Rismayanti

	Hasanuddin University, Indonesia
M4047	Descriptive Epidemiology of Neonatal Mortality in Gowa District 2015 Amalya Rezky Putri, Jumriani Ansar and Dian Sidik Arsyad Hasanuddin University, Indonesia
M4048	Behavioral Prevention of Family toward Typhoid Fever among Children in Kassi-Kassi Public Health Center Working Area at Makassar City 2014-2015 Astika Putri, H. A. Arsunan Arsin and Indra Dwinata Hasanuddin University, Indonesia
M4049	Factors Associated with Obesity Prevention Efforts among the Senior High School Students in Makassar City Elsa W Novianti Helmi, H. Ridwan Amiruddin and Ida Leida M. Thaha Hasanuddin University, Indonesia
M4050	Correlative Factors of Stroke Prevention Efforts among the Senior High School Students in Makassar City Elyeser Tandilino, Elyeser Tandilino and Jumriani Ansar Hasanuddin University, Indonesia
M4052	Okra Powder Effect to Low Density Lipoprotein and Triglycerides in Diabetic Wistar Rat Ananda Eka Arwini, Syahrir A. Pasinringi, Nurhaedar Jafar Hasanuddin University, Indonesia

Conference Venue

University of Tsukuba

The University of Tsukuba aims to establish free exchange and close relationships in both basic and applied sciences with educational and research organizations and academic communities in Japan and overseas. While developing these relationships, we intend to pursue education and research to cultivate men and women with creative intelligence and rich human qualities.

The University of Tsukuba endeavors to contribute to the progress of science and culture. Formerly, Japanese universities tended to remain cloistered in their own narrow, specialized fields, creating polarization, stagnation in education and research and alienation from their communities.

The University of Tsukuba has decided to function as a university which is open to all within and outside of Japan. Toward this end, the university has made it its goal to develop an organization better suiting the functions and administration with a new concept of education and research highly international in character, rich in diversity and flexibility and capable of dealing sensitively with the changes occurring in contemporary society.

To realize this, it has vested in its staff and administrative authorities the powers necessary to carry out these responsibilities.

Laboratory for Advanced Research B

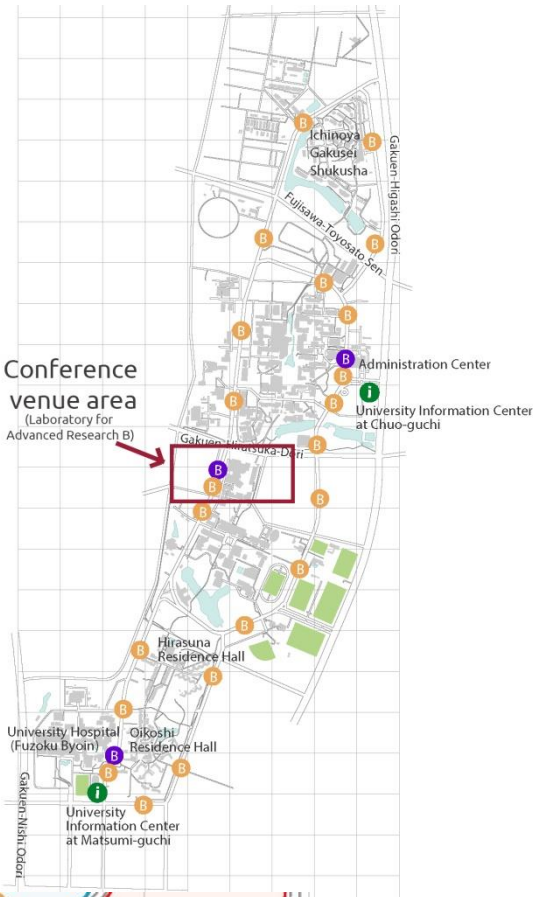
University of Tsukuba

Address: 1-1-1 Tennodai, Tsukuba, Ibaraki 305-8577 Japan

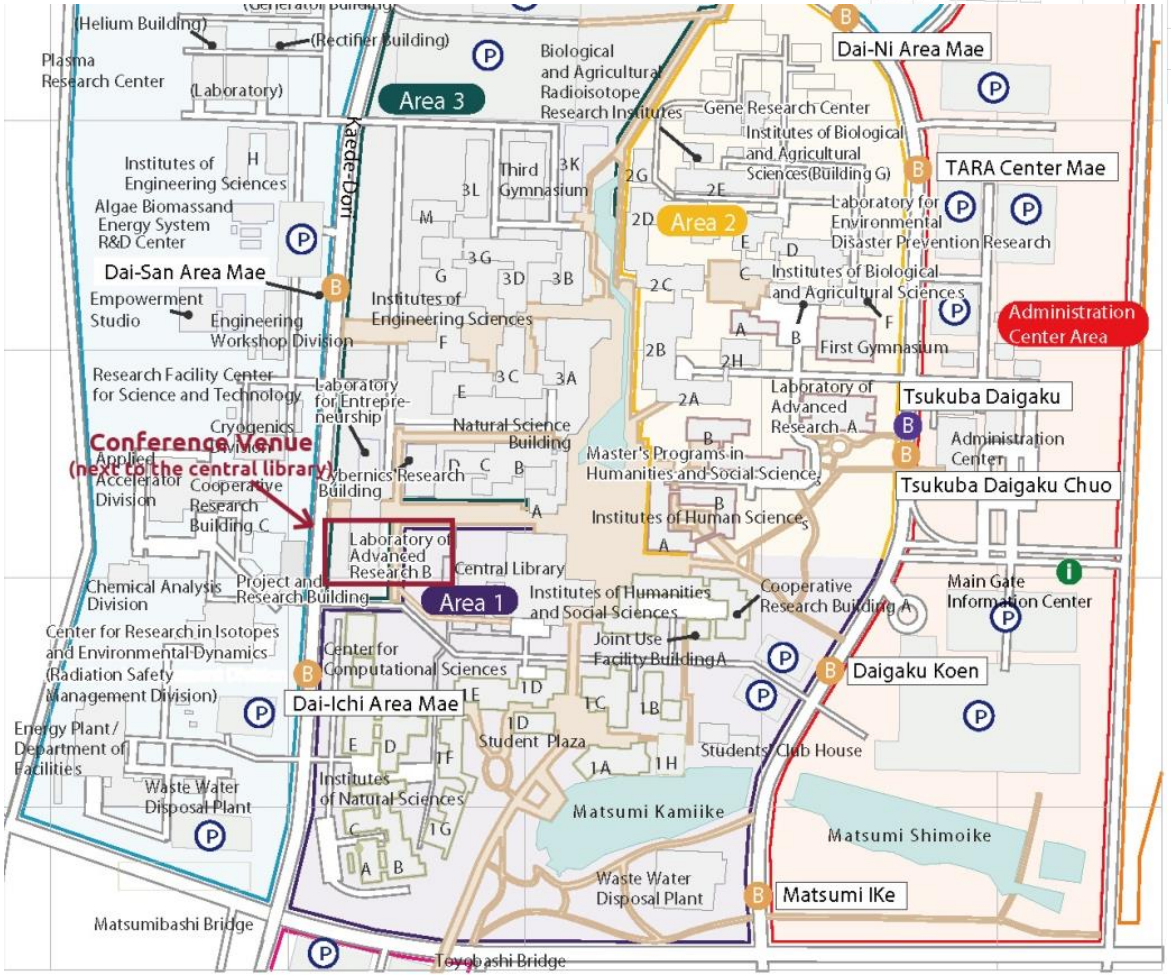
Campus Map

The Laboratory for Advanced Research B is in the central area of the campus. The building is next to the Central Library.

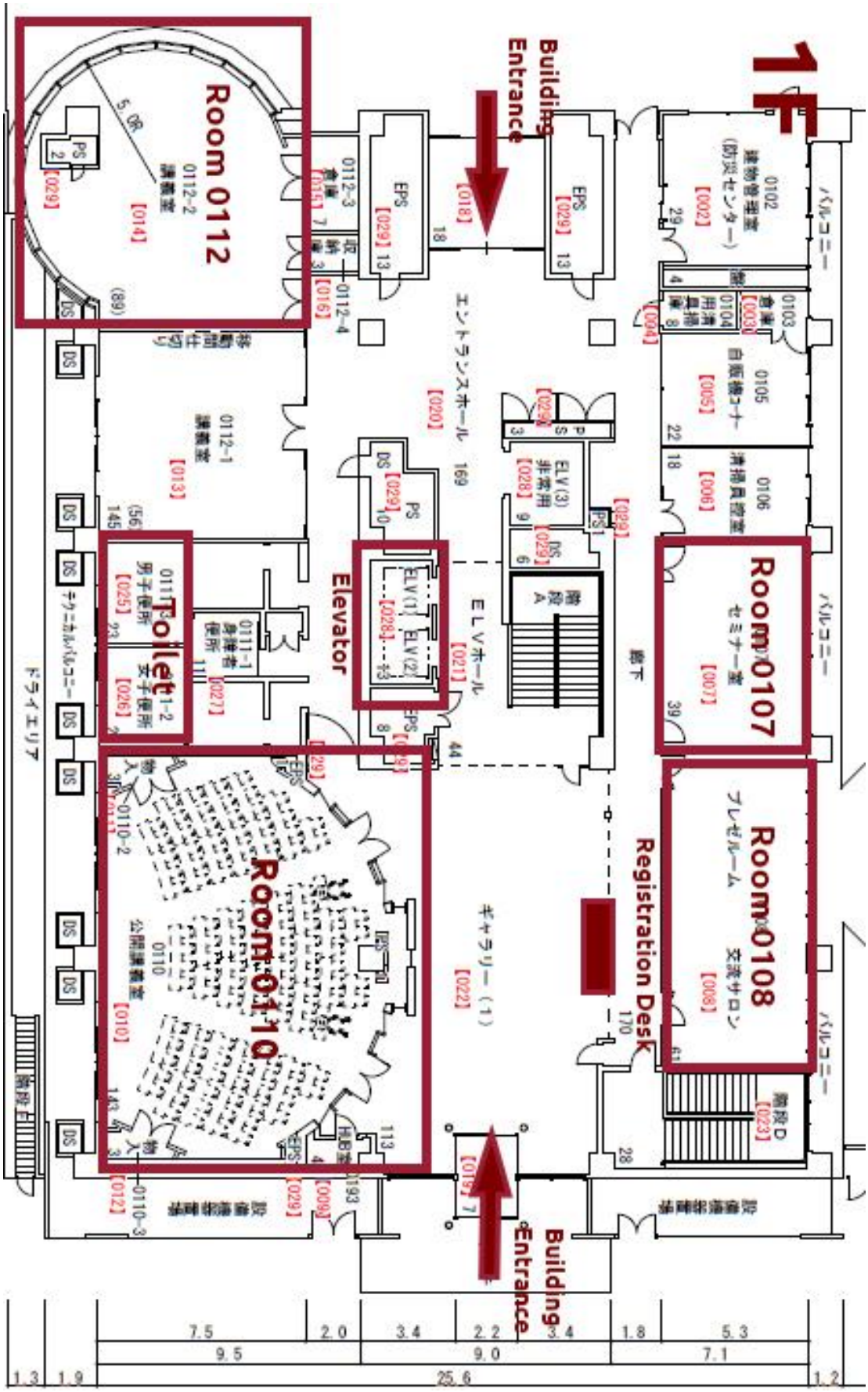
Over view of the campus map ►

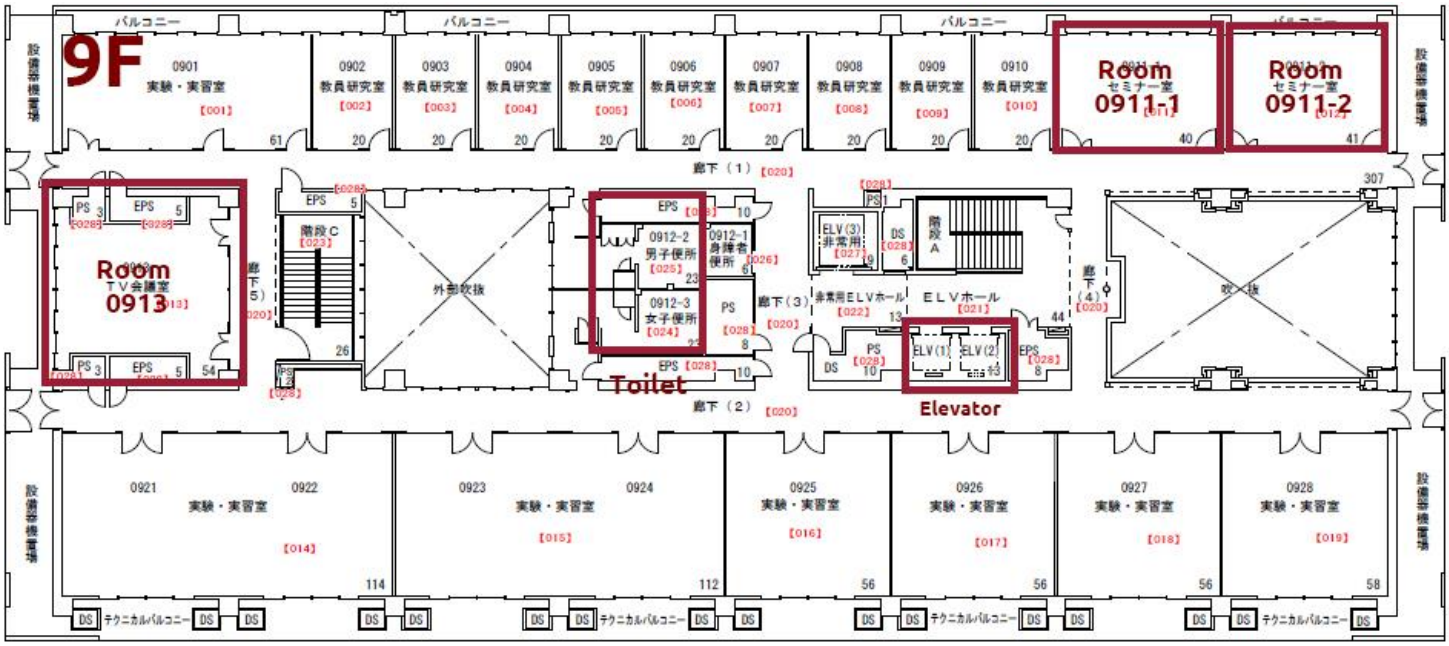


Zoom in of the central area campus ▼



Laboratory for Advanced Research B Floor Map

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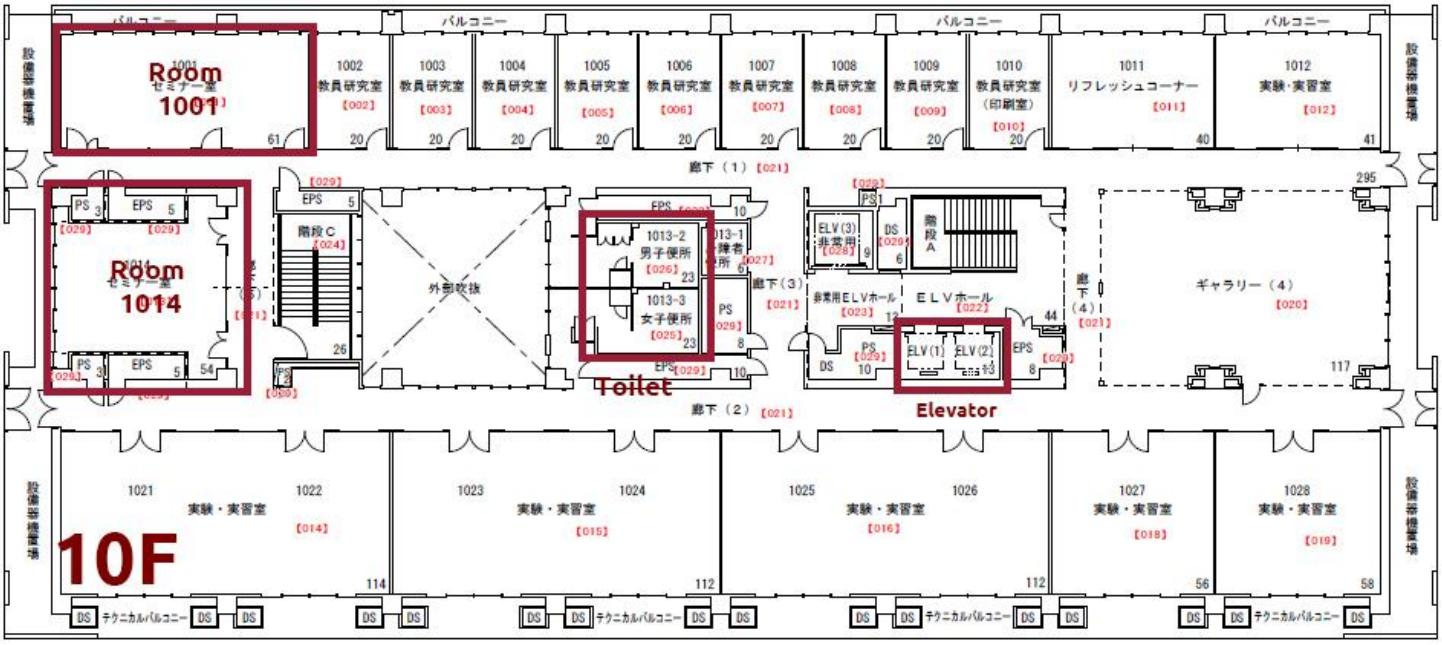
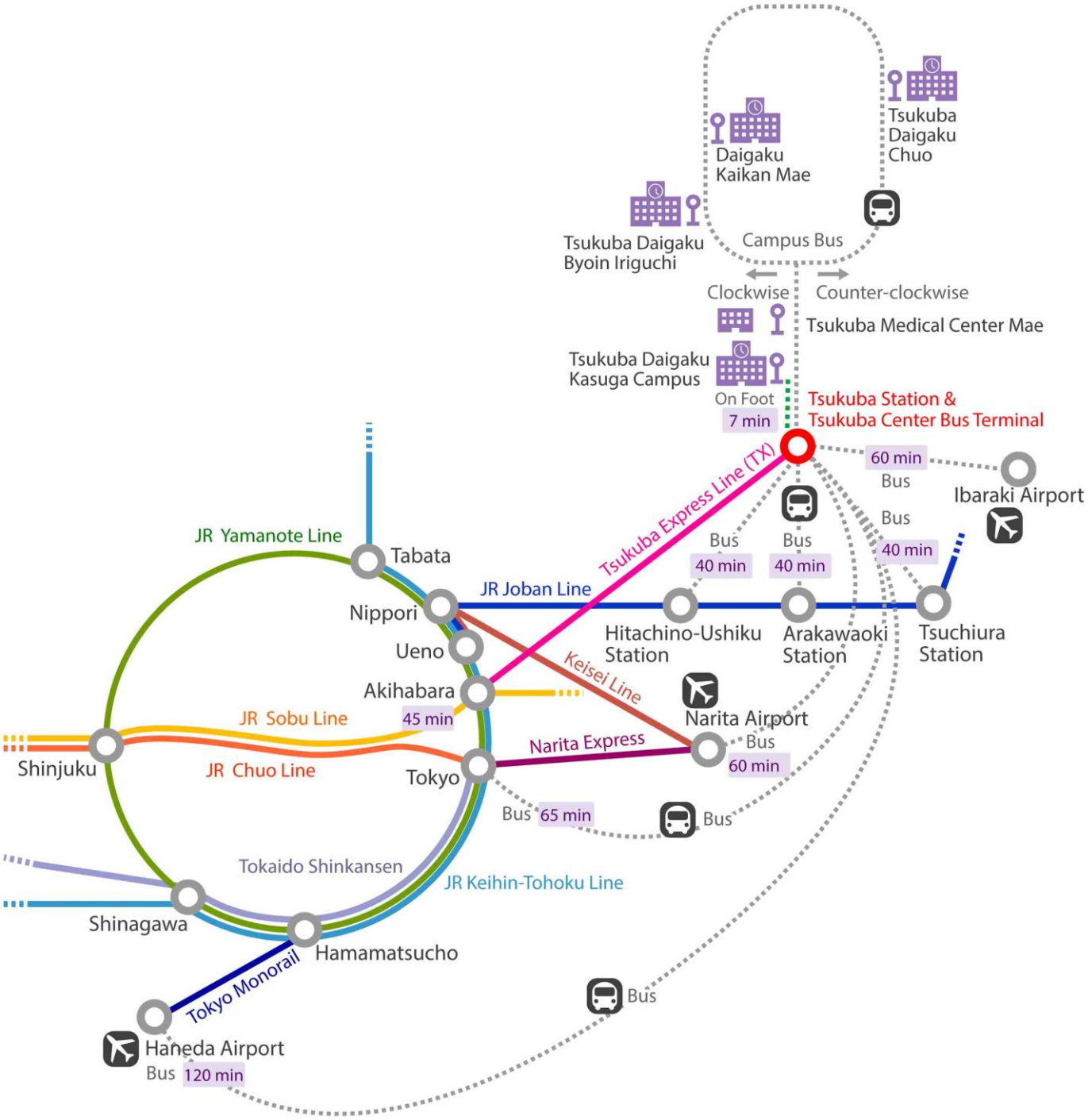
Room 0913
Room 0911-1
Room 0911-2
Toilet
Elevator


Room 1001
Room 1014
10F
Toilet
Elevator

Transportation



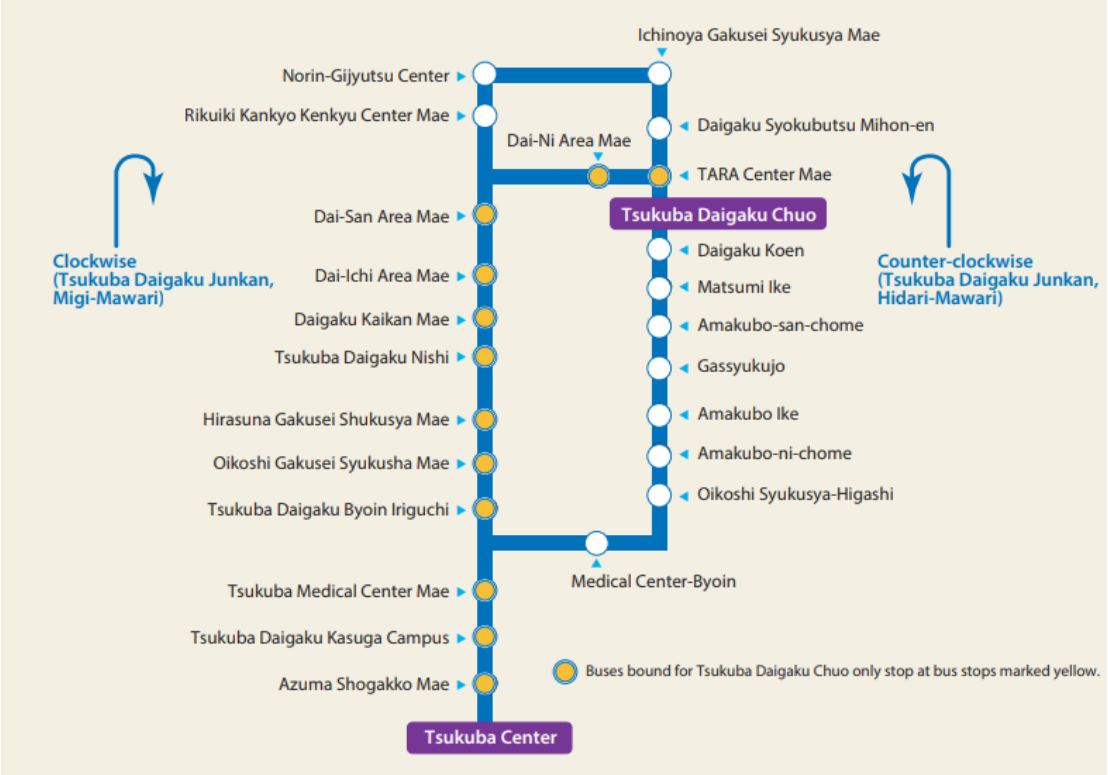
Access to Tsukuba

Transportation	Directions
Tsukuba Express (TX)	45 minutes from Akihabara Station to Tsukuba Station by rapid train. After getting off at Tsukuba Station, you can take a bus.
Highway Express Bus from Tokyo Station	About 75 minutes from Tokyo Station Yaesu South Exit by bus bound for "Tsukuba Daigaku" • About 65 minutes from Tokyo Station Yaesu South Exit by bus bound for "Tsukuba Center" * See Access to the University of Tsukuba from Tsukuba Station.
Airport bus	**Narita Airport** (To Tsuchiura / Tsukuba: Airport bus (NATT'S) + bus) About 60 minutes from Narita Airport by bus bound for "Tsukuba Center". Take a bus at the bus stop at the Terminal 1, the Terminal 2, or the Terminal 3. **Haneda Airport** (To Tsukuba Center: Airport bus + bus) About 120 minutes from Haneda Airport by bus bound for "Tsukuba Center". Take a bus at the bus stop No.6 in the International Terminal or at the bus stop No.13 in the Terminal 1 or 2. **Ibaraki Airport** (To Tsukuba Center: Airport bus + bus) About 60 minutes from Ibaraki Airport by bus bound for "Tsukuba Center". * See Access to the University of Tsukuba from Tsukuba Station.
By car	**Driving directions from Joban Expressway** Access to the university by taking the Joban Expressway (the way to the Administration Center, the University of Tsukuba) Drive to the Sakura Tsuchiura Interchange Exit, Turn left to Tsukuba Direction → Turn right at Sasagi Intersection → Drive further north on the Prefectural Highway 55 (Higashi Odori (East Avenue)) → Turn left at the signal "Tsukuba Chuo Iriguchi (Main Entrance)" (about 8km) **Driving directions from Route 6** Drive north on the Prefectural Highway 55 (Higashi Odori (East Avenue)) → Go straight down Sasagi Intersection

	→ Turn left at the signal "Tsukuba Chuo Iriguchi (Main Entrance)" **Parking lot** A parking permit will be issued for a visitor at "Main Gate Information Center" or "Matsumi-guchi Annai Center". Please see the website of the Traffic Safety Committee, University of Tsukuba for details.

Access to the University of Tsukuba from Tsukuba Station

Bus Route Map



University Loop-line On-campus Bus [Tsukuba Daigaku Junkan Bus] (clockwise or counterclockwise)

* To reach the following stops, please take a bus bound for "University Loop-line On-campus Bus [Tsukuba Daigaku Junkan Bus]".

North Area: Norin-Gijutsu Center, Ichinoya Gakusei Shukusha Mae, Daigaku Shokubutsu Mihon-en

Central Area: Niji no Hiroba, Daigaku Koen, Matsumi Ike

South Area: Gasshukujo, Amakubo Ike, Amakubo-san-chome (Off campus)

West Area: Amakubo-ni-chome, Oikoshi Shukusha-Higashi, Medical Center Byoin

One-Way Fare: 170-270yen

A seven-minute walk from TX Tsukuba Station to the Tsukuba Campus Kasuga Area

Nearest bus station: Tsukuba Daigaku Kasuga Area

One Day Tour

June 10, 2018 (Sunday) 9:00~17:00

(Tip: Please arrive at Laboratory for Advanced Research B, University of Tsukuba before 9 a.m. The following places are for references, and the final schedule should be adjusted to the actual notice.)

1. **(9:00) Assemble at Laboratory for Advanced Research B, University of Tsukuba**
2. **(9:30-10:20) Morning Visit in Japan Institute for High Energy Physics**

The High Energy Accelerator Research Organization (Kō Enerugī Kasokuki Kenkyū Kikō), known as KEK, is a Japanese organization whose purpose is to operate the largest particle physics laboratory in Japan, situated in Tsukuba, Ibaraki prefecture. It was established in 1997. The term "KEK" is also used to refer to the laboratory itself, which employs approximately 695 employees. KEK's main function is to provide the particle accelerators and other infrastructure needed for high-energy physics, material science, structural biology, radiation science, computing science, nuclear transmutation and so on. Numerous experiments have been constructed at KEK by the internal and international collaborations that have made use of them. Makoto Kobayashi, emeritus professor at KEK, is known globally for his work on CP-violation, and was awarded the 2008 Nobel Prize in Physics.

3. **(11:00-11:50) Morning Visit in The Japan Aerospace Exploration Agency**

The Japan Aerospace Exploration Agency (JAXA) (Kokuritsu-kenkyū-kaihatsu-hōjin Uchū Kōkū Kenkyū Kaihatsu Kikō, literally "National Research and Development Agency on Aerospace Research and Development") is the Japanese national aerospace and space agency. Through the merger of three previously independent organizations, JAXA was formed on 1 October 2003. JAXA is responsible for research, technology development and launch of satellites into orbit, and is involved in many more advanced missions such as asteroid exploration and possible manned exploration of the Moon. Its motto is One JAXA and its corporate slogan is Explore to Realize (formerly Reaching for the skies, exploring space).

4. **(12:00) Lunch time (At own expense)**
5. **(14:00-17:00) Visit Mashiko Corridor**
6. **(17:00) Back to Laboratory for Advanced Research B, University of Tsukuba**

Author Index

	and Thoughts from Internet Blogs **Frank Verbeke** and **Ellen Schryvers** Vrije Universiteit Brussel, Belgium		
I0026	Prediction of Loneliness in Older People **Hui Yang** and Peter A. Bath University of Sheffield, UK	Session < Healthcare Quality Management >	Page 73
I0027	The Exploration of Planned Extubation of Cardiovascular Surgery Patients in a Southern Taiwan Hospital **Jia-Wei Lin**, Ai-chin Cheng, Shu-Chen Hsing, Shih-Jen Chiang, YC Hsu and Sho-fang Chang Chi Mei Medical Center, Taiwan	Session < Health Policy and Management >	Page 75
I0028	Augmented Reality for Supporting Real Time Telementoring: An Exploratory Study Applied to Ultrasonography **Mauro Del Rio**, Vittorio Meloni, Francesca Frexia, Francesco Cabras, Roberto Tumbarello, Sabrina Montis, Andrea Marini and Gianluigi Zanetti Center for Advanced Studies, Research and Development in Sardinia(CRS4), Italy	Session < Medical Image Processing>	Page 94
I0030	Towards Automated Knowledge Discovery of Hepatocellular Carcinoma: Extract Patient Information from Chinese Clinical Reports **Hongmei Yang**, Lin Li, Ridong Yang and Yi Zhou Sun Yat-sen University, China	Session < Electronic Health Records >	Page 64
I0034	Successful Experience on Procuring Organ Donation: A Case Series **Hung-Ching Wu**, Jia-Wei Lin, Mei-mei Sung, Chin-ying Ho and Shofang Chang	Session < Health Policy and Management >	Page 76

	Chi Mei Medical Center, Taiwan		
I0035	Development of CERIA: A Mobile Application to Support Community-empowered Dementia Prevention Program in Indonesia **Muhammad Aji Muharrom** and Hera Afidjati Universitas Indonesia, Indonesia	STD Competition Session 3: Undergrads Group	Page 37
I0036	CARS (Circumcision Augmented Reality Simulation): An Augmented Reality Application for Circumcision Simulation Hariyono Winarto, **Muhammad Sobri Maulana** and Gassani Amalia Universitas Indonesia, Indonesia	Session < Medical Image Processing>	Page 95
I0037	Mental Health Surveillance from Elderly Health Examination Database in Taipei **Ta-chien Chan** and Yi-Syuan Wu Academia Sinica, Taiwan	Session < Electronic Health Records >	Page 66
I0038	Evaluating Hospital Service Quality: A Combination of the AHP and TOPSIS M. Mujiya Ulkhaq, Finsaria Fidiyanti, **M. Fauzan M. Raharjo**, Aryati D. Siamiaty, Rahayu E. Sulistiyani, Pradita Y. Akshinta and Eriawan Agung Nugroho Department of Industrial Engineering of Diponegoro University,Indonesia	Session < Healthcare Quality Management >	Page 70
I0041	Association of Sociodemography and Cardiometabolic Factors to Stress: A Cross-Sectional Study Among Employees in X University, Jakarta **Lumintang AV, Handayani LGLR and Putri LR** Universitas Indonesia， Indonesia	Session < Healthcare Quality Management >	Page 70

I0043	Elderly Fall Risk Evaluation through Deep Learning of Inertial Sensor Data Collected from 3M TUG Test **Tien-Lung Sun**, Tomas Mendoza, Chien-Hua Huang, Chia-Hsuan Lee and Victor Ham Choi Yuan-Ze University, Taiwan	Session < Medical Image Processing>	Page 96
I0049	Developing Epidemic Forecasting Models to Assist Disease Surveillance for Influenza with Electronic Health Records Yu-Lien Shih and **Yi-Ju Tseng** Chang Gung University, Taiwan	Session < Electronic Health Records >	Page 67
I0050	An Embedding-Based Approach for Oral Disease Diagnosis Prediction from Electronic Medical Records **Guangkai Li**, Songmao Zhang, Jie Liang, Zhanqiang Cao and Chuanbin Guo University of Chinese Academy of Sciences, China	STD Competition Session 2: Master Group	Page 35
I0050	An Embedding-Based Approach for Oral Disease Diagnosis Prediction from Electronic Medical Records **Guangkai Li**, Songmao Zhang, Jie Liang, Zhanqiang Cao and Chuanbin Guo University of Chinese Academy of Sciences, China	Session < Electronic Health Records >	Page 68
I0051	Using Data Mining Approach to Improve Diagnostic Accuracy for Bladder Cancer **Chia Lun Lo** Fooyin University，Taiwan	Session < Biomedical Data Mining >	Page 59
I0142	Making Semantic Annotation on Patient Data of Depression **Du Yanan**, Lin Shaofu and Huang Zhisheng Beijing University of Technology,China	Session < Electronic Health Records >	Page 68

I0144	Application of Neural-Network Techniques to Analyze the Common Key Factors of Using CT and MRT in Hospitals **Chien-Chih Wang** and Hsiu-Chuan Yen Ming Chi University of Technology, Taiwan	Session < Medical Image Processing>	Page 96
I0147	Analyzing the Terminal Protein Differences of Adenovirus Serotype 2(Ad2) and Human Herpes Virus-4(HHV-4) by Using Support Vector Machine Dain Kim, **Nooroo Bae**, Jihoon Yoon and Taeseon Yoon Hankuk Academy of Foreign Studies,Republic of Korea	Session < Biomedical Data Mining >	Page 59
I0149	Sex and Ethnicity as Contributing Factor to the Development of Torus Palatinus and Its Characteristics: a Cross-Sectional Study Among Western Indonesian Population **Raka Aldy Nugraha**, **Kiwah Andanni Bangsawan**, **Aditya Indra Pratama** and Aswin Guntara University of Indonesia, Indonesia	Session < Health Policy and Management >	Page 78
I0153	Interactive Augmented Live Virtual Reality Streaming: A Healthcare Application **Chia-Chi Teng**, Nathan Jensen, Timothy Smith,Talon Forbush, Kyle Fletcher and Michael Hoover Brigham Young University, USA	Session < Medical Image Processing>	Page 96
I0156	SlimMe: a Virtual Diet Assistant Based on Conversational Artificial Intelligence for Personal Weight Loss Management **Annisa Ristya Rahmanti** and Yu-Chuan (Jack) Li Taipei Medical University, Da'an Campus, Taiwan	STD Competition Session 2: Master Group	Page 35
I0161	Tea in Benefits of Health: A literature Analysis Using Text Mining and Latent Dirichlet Allocation **Ching-Hsue Cheng** and Wei-Lun Hung	Session < Health Service Management >	Page 57

	National Yunlin University of Science and Technology, Taiwan		
I0164	A Method of Using Machine Learning to Predict Falls Risk **Way-Ren Huang**, Ruo-Chia Tseng, Tso-Ying Lee, Chun-Wen Huang and Woei-Chyn Chu Tzu Chi University, Taiwan	Session < Biomedical Data Mining >	Page 60
I0165	NFC Mobile Medication Video Notification System **Chun-Chi Wan**g and Jr-Ping Wang National Kaohsiung University of Science and Technology, Taiwan	Session < mHealth Apps >	Page 63
I0173	Ensemble Learning for Risk Factors Identification and Secondary Cancer Diagnosis by Considering Class Imbalance **Xiucai Ye**, Tetsuya Sakurai and Chi-Chang Chang University of Tsukuba, Japan	Session < Electronic Health Records >	Page 69
M0003	Cancer Screening Decision Making Models Based on Health Status Utilities **John Maleyeff** and Danrong Chen Boston University, USA	Session < Biomedical Data Mining >	Page 61
M0005	Reliability of Thyroid Dysfunction Questionnaire (TDQ) **M Mutalazimah,** Budi Mulyono, Bhisma Murti, Saifuddin Azwar, Pramudya Kurnia Universitas Muhammadiyah Surakarta, Indonesia	Session < Healthcare Quality Management >	Page 71
M0014	Vascular and dementia survey in aged volunteers involving in recycling work in North Taiwan **Shinn-Kuang Lin** Taipei Tzu Chi Hospital, Taiwan	Session < Healthcare Quality Management >	Page 72

M0015	Policy Options for Cervical Cancer in the Pacific **Ledua Tamani** Fiji National University, Fiji Islands	Session < Health Policy and Management >	Page 77
M0020	The Welfare Analysis for the New Co-Payment Policy for Emergency Department Visits under Taiwan National Health Insurance **Wen-Yi Chen** and Yu-Hui Lin National Taichung University of Science and Technology, Taiwan	Session < Electronic Health Records >	Page 67
M0024	Critical Factors of Lean Healthcare: an Overview Carlos Zepeda-Lugo, **Diego Tlapa**, Yolanda Baez-Lopez and Jorge Limon-Romero Universidad Autónoma De Baja California, Mexico	Session < mHealth Apps >	Page 64
M1001	Health Insurance, Treatment & Lung Cancer Survival: The Commonwealth of Kentucky Study Case **Morita Sari**, James. W,.Holsinger, Sarah Wackerbath, Richard Ingram Muhammadiyah University Surakarta, Indonesia	Session < Health Policy and Management >	Page 77
M0022	Feature Extraction for Photoplethysmographic Signals using PWA: PPG Waveform Analyzer **Pourush Sood**, Shibabroto Banerjee, Prof. Sujoy Ghose, Prof. Partha Pratim Das Indian Institute of Technology Kharagpur, India	STD Competition Session 2: Master Group	Page 36
M0026	A Method for Neonates Nursing Decision by Voice Identification Na Kang, Huiyan Wang, Yufan Yuan The Forth Hospital of Shijiazhuang, China	Session < mHealth Apps >	Page 64

M2003	Life Chasing - A Location-based Game Prototype for Elderly Health Promotion **Meng-Pei Lee**, Hsiang-Yu Hu, Hsing Mei Fu-Jen Catholic University, Taiwan	Session < mHealth Apps >	Page 63
M3001	Situational Analysis on Health Services for People with Chronic Diseases and Groups with High Risk: A Case Study at Kohkha Municipality, Lampang, Thailand **Lapatrada Numkham**, Kaysorn Sumpowthong, and Porntip Chompook Thammasat University, Lampang Center, Thailand	Session < Healthcare Quality Management >	Page 72
M3002	The influence of communication method among clinic doctors on satisfaction of patients in Traditional Chinese Medicine hospitals in Beijing **Kunmeng Liu**, Ging Chan, Yuanjia Hu University of Macau , China	Session < mHealth Apps >	Page 63
SS01-01	Glucose Level Detection in Vitro Based on Fourier Transform of Photoacoustic Imaging Signals **Tsu-Wang Shen**, Hemalatha Mani, Yuwei Zhan and Jen-Hung Yang Tzu Chi University, Taiwan	Special Session < Medical and Healthcare System Technology >	Page 40
SS01-02	Using a Cross-Validation Approach on Multiple Microarrays to Analyze Significant Genes in Colorectal Cancer Hendrick, **Liang-Tsung Huang**, Ching-Sheng Hsu and Jiann-I Pan Department of Medical Informatics, Tzu Chi University	Special Session < Medical and Healthcare System Technology >	Page 40
SS01-03	Applying Data Mining and Fuzzy Logic Techniques to Analyze a Medical Examination Database Chien-Ting Chen, **Jenn-Long Liu** and Yun-Yun Chang	Special Session < Medical and Healthcare System Technology >	Page 41

	I-Shou University, Taiwan		
SS01-04	Enhanced Chaotic Map-based Authenticated Key Agreement with Privacy Protection for Multi-receiver Environment **I-Pin Chang** University of Kang Ning, Taiwan	Special Session < Medical and Healthcare System Technology >	Page 42
SS01-05	An Improved Authenticated Key Agreement protocol with Privacy Protection for Mobile Healthcare Systems with Wearable Sensors **Tian-Fu Lee**, Yin-Yu Diao and Meriske F. Chen Tzu Chi University, Taiwan	Special Session < Medical and Healthcare System Technology >	Page 42
SS02-01	The Cognitive Difference of Complementary and Alternative Medicine among Physician- Patients Relationships **Yu-Ju Chou**, Yen-Hung Yeh and Hsin-Yi Chang Department of Health Diet and Industry Management, Chung Shan Medical University, Taiwan	Special Session < Social Sciences and Public Health >	Page 43
SS02-03	The Effect of Perceived Crowding to Customer Dysfunctional Customer Behavior: Negative Emotion and Anticipated Regret as Mediator **Sih-Sian Yu**, Jia-Jen Ni and Chi-Feng Lo Department of Health Diet and Industry Management, Chung Shan Medical University, Taiwan	Special Session < Social Sciences and Public Health >	Page 43
SS02-04	The Relationship between Workplace Friendship and Work Engagement **Chi-Feng Lo** and Churn-Yu Chen Chung-Shan Medical University, Taiwan	Special Session < Social Sciences and Public Health >	Page 44

SS02-06	Can Sugar Labeling Reduce Sugar-Sweetened Beverages Purchase intention? A perspective from TPB model Hsin-Hui Lee, Hsu-Ju Teng and Han-Shen Chen Department of Health Diet and Industry Management, Chung Shan Medical University, Taiwan	Special Session < Social Sciences and Public Health >	Page 44
SS02-07	Explore the Factors that Consumers Have for Queuing Food Behavior - Taking Taichung University Students as an Example **Hung-Chih Hsu** and Kuan-Lin Yeh Department of Health Diet and Industry Management, Chung Shan Medical University, Taiwan	Special Session < Social Sciences and Public Health >	Page 45
SS03-01	Evaluative Framework for Interactive Sensory and Emotional Design: Health Care Reminder on Computer Sedentary Groups **Sheng-Chih, Chen** and Shin-Tsz, Chen National ChengChi University, Taiwan	Special Session < User Experience Based Service Innovation in Healthcare Management>	Page 97
SS03-03	Data Mining for Enhanced Filtration Rate of Kidney Sliver in Chinese and Western Medicine **Kuo-Yi Lin** and Yu-Hsuan Liu Asia University, Taiwan	STD Competition Session 3: Undergrads Group	Page 38
SS03-04	User Experience Sharing System to Enhance Customer Satisfaction **Kuo-Yi Lin**, Jessica Su, I-Tien Chu and Hsiao-Ling Wu Asia University, Taiwan	Special Session < User Experience Based Service Innovation in Healthcare Management>	Page 98
SS04-01	The Risk Factors of Needle Sickness During Acupuncture **Chiung-Hsin Chang** and Tse-Hung Huang Department of Internal Medicine, Chang Gung Memorial Hospital, Taiwan	Special Session < Complementary and Integrative Medicine in Health Care Sysytem>	Page 99

SS04-02	The Beneficial Effects of Moxibustion on the Overweight Adolescent Girls **Yuan-Chieh Yeh**, Hsin-Ning Chang and Tse-Hung Huang Chang Gung Memorial Hospital,Taiwan	Special Session < Complementary and Integrative Medicine in Health Care Sysytem>	Page 100
SS04-04	Case Based Reasoning Driven Ontological Intelligent Health Projection System Chuan-Jun Su, **Shi-Feng Huang** and Yi Li Yuan Ze University, Taiwan	STD Competition Session 1: PhD Group	Page 33
SS04-05	A Medical Co-creation System Crafts B2B Marketing Chien-Yi Yang and **(Abbott) Po Shun Chen** Chaoyang University of Technology, Taiwan	Session < Health Service Management >	Page 58
SS04-06	A Study Case for Medical Material APP in Consumer Intention: An Interacting Marketing View **Yut-Su Lin**, Ming-Jyh Wang and Abbott Po-Shun Chen Chaoyang University of Technology, Taiwan	Session < Health Service Management >	Page 58
SS04-07	Is Acupuncture Effective and Safe for the Treatment of Breast Cancer-related Lymphedema? A Narrative and Systematic Review **Tse-Hung Huang** and Chun-Wei Chen Chang Gung Memorial Hospital, Taiwan	Special Session < Complementary and Integrative Medicine in Health Care Sysytem>	Page 100
SS05-01	The Impact of PAC on Quality of Life among Stroke Patients **Yu-Jo Yeh**, Chung-Yuan Wang, Chung-Yuan Wang, Hsiu-Fen Lin, Kuo-Wei Hung and Hon-Yi Shi Kaohsiung Medical University, Taiwan	Special Session < Value Co-Creation of Emerging ICT Technologies	Page 80
SS05-02	Computer Aided Diagnosis of Heart Disease in Children Based on Classification Algorithm	Special Session < Value Co-Creation of Emerging ICT	Page 80

	Cheng-En Tasi, Chu-Chuan Lin and **Chun-Wang Wei** Kaohsiung Medical University,Taiwan	Technologies	
SS05-04	Application of E-Da Healthcare Cloud in Health Management and Health Promotion **Chao-Sung Chang**, Chih-Lung Hung, Te-Tsun Shen, Shiuh-Ming Huang and Pen-Tsung Huang E-Da Cancer Hospital and I-Shou University, Taiwan	Special Session < Value Co-Creation of Emerging ICT Technologies	Page 81
SS05-05	A Sensor-based Plastics Rod with Cloud Service for Upper-limb Rehabilitation Chin-Shiuh Shieh, Ching-Hsin Kao, **Yu-Heng Lin** and Mong-Fong Horng National Kaohsiung University of Science and Technology, Taiwan	Special Session < Value Co-Creation of Emerging ICT Technologies	Page 81
SS05-06	Critical Values Notifications and Management to Improve Patient Safety: Using Mobile Devices to Improve Critical Value Notification **Shu-Ching Hsueh**, Yi-Ching Lin, Chao-Ju Chen, Shiuh-Liang Hsu, Su-Chin Liang and Fong-Chin Wang Medical University Hospital, Kaohsiung Medical University, Taiwan	Special Session < Value Co-Creation of Emerging ICT Technologies	Page 82
SS05-07	Employ Team Resource Management to Construct the Teamwork of Neonatal Resuscitation Program Pi-Yueh Lee and **Chin-Yen Tsai** Yuan`s General Hospital,Taiwan	Special Session < Value Co-Creation of Emerging ICT Technologies	Page 83
SS05-08	Exploring Factors Surrounding Students' Entrepreneurial Intentions in Healthcare Informatics: The Theory of Planning Behavior Perspective **Hao-Yun Kao**, Chin-Yung Hong and Wen-Hsiung Wu Kaohsiung Medical University, Taiwan	Special Session < Value Co-Creation of Emerging ICT Technologies	Page 83

SS06-01	Evaluation of A Mobile Learning System to Support Correct Medication Use for Health Promotion **Ya-Ming Shiue,** Yu-Chiung Hsu, Yu-Chen Liang and Meng-Huei Sheng Chia-Nan University of Pharmacy and Science, Taiwan	Special Session < Information Technology in Health Education >	Page 46
SS06-02	A Study About the Factors Influencing Elders' Continuance Intention to Use APP Communicating with Local Community Cheng-Xuan Lan, Ya-Ming Shiue, **Chuan-Gang Liu** Chia-Nan University of Pharmacy and Science, Taiwan	Special Session < Information Technology in Health Education >	Page 46
SS06-03	Impact of An Augmented Reality System on Students' Learning Performance for A Health Education Course **Ya-Ming Shiue**, Yu-Chiung Hsu, Meng-Huei Sheng and Cheng-Hsuan Lan Chia-Nan University of Pharmacy and Science, Taiwan	Special Session < Information Technology in Health Education >	Page 47
SS06-05	Developing an Integrated Classification Model for Postprandial Blood Glucose: A Cohort Study Chi- Chang Chang，Jason Chou-Hong Chen，**Fong-Jung Yu** and Chi-Jie Lu Da-Yeh University, Taiwan	Special Session < Information Technology in Health Education >	Page 47
SS06-06	Predicting Second Primary Cancer and Identifying Risk Factors for Breast Cancer Patients in Taiwan Chi-Chang Chang, **Ssu-Han Chen**, Chi-Jie Lu and Yen-Chiao Lu Ming Chi University of Technology, New Taipei City, Taiwan	Special Session < Information Technology in Health Education >	Page 48
SS07-01	Duration and Determinants of First Unplanned Hospitalization among Nursing Home Residents **Hsiao Fang Hsiung,** Liang Ju Chen and Shu Fen Chi	Special Session < Medical Care, Social Participation and Workforce of Long Term Care >	Page 49

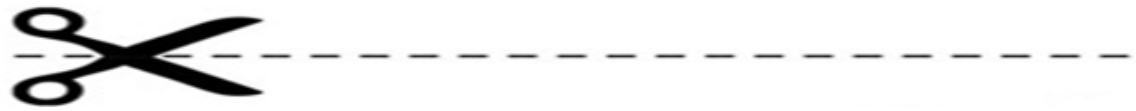
	Chang Gung University of Science and Technology, Taiwan		
SS07-02	Workplace Bullying and Workplace Deviance: Example of Care Attendant **Pei-Jin Su**, Chen-Chieh Chang and Yen-Chun Peng Tungs' Taichung MetroHarbor Hospital,Taiwan	Special Session < Medical Care, Social Participation and Workforce of Long Term Care >	Page 50
SS07-03	The Effect of Workplace Violence and Job Stress on Health Among Home Care Assistants Liang-Ju Chen, **Shi Ling Lin** and Wen Ling Huang HungKuang University, Taiwan	Special Session < Medical Care, Social Participation and Workforce of Long Term Care >	Page 50
SS07-04	The Relationship between the Use of Technology Products and Social Participation among Elderly Liang-Ju Chen, **Pin-Chun Che**n and Hsiao-Fang Hsiung Hungkuang University, Taiwan	Special Session < Medical Care, Social Participation and Workforce of Long Term Care >	Page 51
SS07-05	A Mediating Effects of Job Satisfaction on the Relationship between Job Stress, Social Support and Intention to Stay of Home Care Workers in Central Taiwan **Liang-Ju Chen**, Jung-Hsuan Wang and Sin-Rong Yang Hungkuang University, Taiwan	Special Session < Medical Care, Social Participation and Workforce of Long Term Care >	Page 52
SS08-01	Apneas Detection Based on Oxygen Desaturation Index **Chung-Chi Yang**, Fong-Ren Wu, and Jui-Chien Hsieh Yuan Ze University, Taoyuan, Taiwan	Special Session < Health and Biomedical Informatics >	Page 53
SS08-02	A Real-Time SPO2 Telemedicine System **Shih-Yao Chou**, Meng-wei Hsu and Jui-chien Hsieh Yuan Ze University, Taoyuan, Taiwan	Special Session < Health and Biomedical Informatics >	Page 53
SS08-03	A Study of the Multi-Agent Benefit Distribution Model in the Transformation of Medical Science and Technology Achievements	Session < Healthcare Quality Management >	Page 74

	Qiang Fu, Yulan Wu, Xue Jiang, Ming Gao and Yang Xu Peking University, China		
SS08-04	Adapting an Evidence-based Diagnostic Model for Predicting Recurrence Risk Factors of Oral Cancer Chi-Chang Chang, Shin Yang Chen,Yi-Chen Chung, **Yi-Ling Huang** Chung Shan Medical University, Taiwan	STD Competition Session 3: Undergrads Group	Page 38
SS08-05	An Optimized Method for the Limb Tremor Measurement **Weiqiang Zeng**, Hai Su, Haipeng Zhong, Haitao Cui, Lihua Sun and Linglin Xia Nanchang University, China	Special Session < Health and Biomedical Informatics >	Page 54
SS08-07	Evaluating 15-Minute Mindfulness Effects via A Wearable EEG Devices **Yu-Hung Tung** and Jui-Chien Hsieh Yuan Ze University, Taoyuan, Taiwan	Special Session < Health and Biomedical Informatics >	Page 54
SS09-01	Efficacy and Safety of Exenatide Versus Insulin in Type 2 Diabetes Mellitus: Systematic Review and Meta-Analysis Bao-Ju Chen, Ju Chuko, **Chi-Hua Tung** and Kuang-Yu Hu Chung-Hua University, Taiwan	Special Session < Intelligent Systems and Applications for Clinical and Patient Information>	Page 101
SS09-02	BreastExtractor: A Word/Phrase Matching-Based Text Mining Program for Automatic Extraction of Hormone Receptor Data from Free-text Pathology Reports on Breast Cancer **Kai-Po Chang**, Chi-Chang Chang, Yen-Wei Chu and John Wang National Chung Hsing University,Taiwan	Special Session < Intelligent Systems and Applications for Clinical and Patient Information>	Page 101

SS09-03	Standardized Automated Patient Movement Analysis Training System **Chih-Hao Lin**, Shih-Nung Chen and Rong-Chi Chang Asia University, Taiwan	Special Session < Intelligent Systems and Applications for Clinical and Patient Information>	Page 102
SS09-04	Risk of Acute Pancreatitis in Type 2 Diabetic Patients Treated with Sitagliptin: A Population-based Study **Yu-Ching Chen**, Hsueh-Ting Chu, Victor C. Kok and Jeffrey J. P. Tsai Asia University, Taiwan	Special Session < Intelligent Systems and Applications for Clinical and Patient Information>	Page 102
SS10-01	A Toolkit for Simulating Medical Data **Jian Li** and Ming-Chih Chen Fu Jen Catholic University,Taiwan	Special Session < Healthcare Management and Expenditure Analysis>	Page 85
SS10-02	Impact of Temperature Variability on the Incidence of Acute Cardiovascular Disease in North Taiwan Tian-Shyug Lee, **Ming Gu**, Ming-Chih Chen, Chi-Jie Lu, Chih-Te Yang and Chien-Chih Wang Fu Jen Catholic University, Taiwan	STD Competition Session 1: PhD Group	Page 34
SS10-03	Research on DRGs Cost Prediction Model based on TCM Symptom **Xu Wang** and Ming-Chih Chen Fu Jen Catholic University,Taiwan	Special Session < Healthcare Management and Expenditure Analysis>	Page 85
SS10-04	Cost Analysis of Patients with Diabetes and Diabetic Nephropathy in Taiwan Ye-Fei Jiang, **Ming-Chih Chen**, Tian-Shyug Lee and Ben-Chang Shia Fu Jen Catholic university,Taiwan	Special Session < Healthcare Management and Expenditure Analysis>	Page 86

SS10-05	Analysis the Influencing Factor in Hospitalization Expenditures for Heart Failure Patient with Different Hospital Levels Tian-Shyug Lee, Ming-Chih Chen, **Yen-Chun Huang** and Kuan-Yu Chen Fu Jen Catholic university,Taiwan	STD Competition Session 1: PhD Group	Page 34
SS10-06	Cross-Sectional Association of Physical Activity and Fitness with Happiness among Older Adults in Taiwan Michael T. S. Lee, Ming-Chih Chen, Chien-chang Ho and **Yi-Tian Lin** Fu Jen Catholic university, Taiwan	Special Session < Healthcare Management and Expenditure Analysis>	Page 86
SS10-07	Extracorporeal Membrane Oxygenation Use, Expenditure, and Outcomes in Taiwan **Yu-Chiao Wang** and Michael T. S. Lee Fu Jen Catholic university,Taiwan	Special Session < Healthcare Management and Expenditure Analysis>	Page 87
SS11-01	Use of Group-Based Trajectory Modeling to Explore Patterns of Stroke in Different Gender Groups Ting-Ying Chien, **Mei-Lien Lee, Wan-Ling Wu** and Hsien-Wei Ting Department of Computer Science and Engineering, Yuan Ze University,T aiwan	Special Session < Medical and Healthcare System Technology>	Page 89
SS11-02	Decision Analysis of Brain Arteriovenous Malformation Treatment **Ting-Ying Chien, Hao-Wei Li** and Hsien-Wei Ting Yuan Ze University，Taiwan	Special Session < Medical and Healthcare System Technology>	Page 90
SS11-03	Disease Trajectory Visualization System Based on Big Data Analytics **Ting-Ying Chien**, Chong-Yi Chen, **Guo-Lun Jin** and Hsien-Wei Ting	Special Session < Medical and Healthcare System Technology>	Page 90

	Yuan Ze University, Taiwan		
SS11-04	The Epidemiology and Cost of Hospital-Treated Traumatic Brain Injuries: a 10-Year Nationwide Survey in Taiwan **Hsien-Wei Ting**, Chien-Lung Chan, Dachen Chu, K. Robert Lai, Nan-Ping Yang, Chun-Chih Liao, Ting Ying Chien and Ren-Hao Pan Taipei Hospital, Ministry of Health and Welfare, Taiwan	Special Session < Medical and Healthcare System Technology>	Page 91
SS11-05	Healthcare Quality and Efficiency in Taiwan. **Su-Ying Hung** and Tai-Hsi Wu Department of Business Administration, National Taipei University, Taiwan	Special Session < Medical and Healthcare System Technology>	Page 92
SS11-06	Retrieving and Clustering Keywords in Neurosurgery Operation Reports Using Text Mining Techniques Chun-Chih Liao, **Wei-Hsuan Lien**, Furen Xiao, I-Jen Chiang, Jau-MinWong and Ke-Chun Huang Yuan Ze University, Taiwan	Special Session < Medical and Healthcare System Technology>	Page 92



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