

PROCEEDINGS

ESMT-2019

**2nd International Conference on Engineering
Smart Materials and Technologies**

Venue: Hotel MyStays Shin-Osaka Conference Center, Japan

Osaka, Japan

Date: April 20-21, 2019



CONFERENCE BOOK OF ABSTRACT PROCEEDINGS

Consortium-ET

Consortium of Engineering & Technology



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Book of Abstracts Proceedings

2nd Annual International Conference on Engineering, Smart Materials and Technologies (ESMT-2019)

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Proceedings of the 2nd Annual International Conference on Engineering, Smart Materials and Technologies (ESMT)

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***2nd Annual International Conference on Engineering,
Smart Materials and Technologies (ESMT)***

Venue: Hotel MyStays Shin-Osaka Conference Center, Japan

Conference Theme: Forum for enhancement of research and developmental activities through networking and sharing ideas.

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CONFERENCE TRACKS

- Computer and Software Engineering
- Mechanical & Metallurgical Engineering
- Electrical & Electronics Engineering
- Civil Engineering
- Bio-Technology & Food Technology
- Chemistry & Chemical Engineering
- Physical, Applied and Life Sciences
- Interdisciplinary

CONFERENCE CHAIR MESSAGE

Michael Sasaoka

“International Conference of Consortium of Engineering & Technology” is a platform that thrives to support the worldwide scholarly community to analyze the role played by the multidisciplinary innovations for the betterment of human societies. It also encourages academicians, practitioners, scientists, and scholars from various disciplines to come together and share their ideas about how they can make all the disciplines interact in an innovative way and to sort out the way to minimize the effect of challenges faced by the society. All the research work presented in this conference is truly exceptional, promising, and effective. These researches are designed to target the challenges that are faced by various sub-domains of the social sciences and applied sciences.

I would like to thank our honorable scientific and review committee for giving their precious time to the review process covering the papers presented in this conference. I am also highly obliged to the participants for being a part of our efforts to promote knowledge sharing and learning. We as scholars make an integral part of the leading educated class of the society that is responsible for benefitting the society with their knowledge. Let’s get over all sorts of discrimination and take a look at the wider picture. Let’s work together for the welfare of humanity for making the world a harmonious place to live and making it flourish in every aspect. Stay blessed.

Thank you.

Michael Sasaoka

Conference Chair

Email: contact@consortium-et.com

CONFERENCE AGENDA

DATE: April 20-21, 2019

LOCATION: Hotel MyStays Shin-Osaka Conference Center, Japan

Event Title: 2nd International Conference on Engineering,

Smart Materials and Technologies (ESMT-2019)

Start Time

- 09:00 am - 09:10 am: Registration & Kit Distribution
- 09:10 am - 09:20 am: Introduction of Participants
- 09:20 am - 09:30 am: Inauguration and Opening address
- 09:30 am - 09:40 am: Grand Networking Session

Tea/Coffee Break (09:40 am - 10:00 am)

CONFERENCE AGENDA

DATE: April 20-21, 2019

LOCATION: Hotel MyStays Shin-Osaka Conference Center, Japan

Event Title: 2nd International Conference on Engineering,

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10:00 am 12:30 pm: First Presentation Session

Room 1

Track A: Business, Social Sciences and Humanities

Presenter Name	Manuscript Title	Paper ID
SEEM-APR-101	Developing Relationship Management Strategies In A Network Context	Hadi Rezaei Vandchali
SEEM-APR-102	Business Ethics in Micro-Enterprises: Lying To Survive?	Calin GURAU
SEEM-APR-105	Building Community Awareness On Wasted Food Through Social Campaign Of Packaged Food Towards Sdgs 2030	Fio Alfarruq
SEEM-APR-105A	Building Community Awareness On Wasted Food Through Social Campaign Of Packaged Food Towards Sdgs 2030	Doni Firnando
SEEM-APR-106	Guidelines to add value to old shop-houses in the Don Mueang area, Bangkok, Thailand	Puangpech Chieowattanakul
SEEM-APR-109	Assessment of A Freshman Seminar in Entrepreneurship in AACSB Accredited Program	Satya P Chattopadhyay
SEEM-APR-111	Exploring Taiwanese Adolescents Moral Philosophy Regarding Software Piracy	Tien-Chi Huang
SEEM-APR-116	The Influence of Reverse Logistics Innovation and Reverse Logistics Performance on Resource Commitment and Reverse Logistics Cost Savings: Automotive Industry vs Automotive After-market Industry	Piyachat Burawat

Track B: Engineering, Technology & Applied Sciences

OSA-349-102E	The 3-Year Disease-Free Survival among Breast Cancer Patients with Complete Pathological Response (Pcr) after Neoadjuvant Chemotherapy: A Matched Case-Control Study	Sin Hua Moi
OSA-349-103E	Internet Addiction of Vocational High School Teenagers in Taiwan: A Cross-sectional Study	Yi-Ling Chen
ESMT-APRIL19-102	BLDC Motor Fault Detection Using Wavelet Transform and Neural Network	Dr Chun-Yao Lee
ESMT-APRIL19-103	Hydrophilic Modification of Polydimethylsiloxane Precursors	I-Ning Shao
ESMT-APRIL19-104	Fault Detection of Induction Motors Based on S-Transform and Back Propagation Neural Network	Chun-Yao Lee

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10:00 am 12:30 pm: First Presentation Session

Room 1

Track A: Business, Social Sciences and Humanities

Presenter Name	Manuscript Title	Paper ID
Track C: Medical, Medicine and Health Sciences		
OSA-349-101M	Detecting the Significant Second Order Gene-Gene Interactions Through A Multi-Objective Approach Of Multifactor-Dimensionality Reduction	Yu Da Lin
OSA-349-106M	Survey of Health Services Satisfactions from NCD Patients in Thailand	Onthida Khamsiriwong

Lunch Break & Closing Ceremony (12:30 pm - 1:30 pm)

CONFERENCE AGENDA

DATE: April 20-21, 2019

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Conference Day 02 (April 21, 2019)

Second day of conference will be specified for touristy. Relevant expenses are borne by Individual him/herself.



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TRACK A

***BUSINESS, ECONOMICS, SOCIAL SCIENCES AND
HUMANITIES***

Developing Relationship Management Strategies In A Network Context

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Keywords: Relationship, Management Strategies, Network Context

In today's turbulent business environment, firms are becoming increasingly interdependent and are no longer expected to compete simply as an isolated business entity. The firm's boundaries continue to extend as they outsource to reach out to one another's resources across the supply chain (SC). The SCs have often been considered as a series of independent organisations which are connected through dyadic ties, often conceptualised as a simple linear system. Although this linear perception of dyadic interactions is worthy of investigation, it does not represent the realities of today's complex SCs. A firm is a part of the overall network and its business strategies depend on its embeddedness in the network structure and how it interacts with other participants. Accordingly, in analysing the firm's business environment, firms should not be considered in isolation, but as being embedded in the network context. As a result, to effectively implement strategies, firms need to address issues in their supply chain network (SCN) and develop effective relationships with different SCN actors to gain necessary resources which are not possessed by themselves. Therefore, the purpose of this paper is to investigate and analyse the current relationship management strategies (RMS) that firms apply to govern the whole SCN. The paper conducts a comprehensive review of the industrial marketing and purchasing (IMP) and SCN literature to explore how firms develop relationships with various actors with the SCN. The findings reveal that the linear perspective is not enough to truly understand the SC and emphasise that firms need to consider a network perspective to analyse their SC, which paves the way to shift from the SC towards a SCN context. By providing the main distinctions between a SCN and a SC, this paper also clarifies the actors' characteristics of the SCN and enhances the understanding of the SCN actor. It furthermore identifies different existing RMS models that firms apply to manage their SCN, synthesising knowledge involving the RMS and SCN. Finally, by outlining further research directions this paper alerts researchers, for example, to investigate RMS in the network context while considering various contingency variables in their future research.

Business Ethics in Micro-Enterprises: Lying To Survive?

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Keywords: Business Ethics; Micro-Enterprises; Survival Strategies; Customer Misinformation; Opportunistic Behavior; Black Market

Despite the importance of Business Ethics in the present-day society, little is known about its application by micro-enterprises (i.e., firms with less than 10 employees). The extant literature has mainly investigated the high-profile business ethics scandals in large companies (e.g., Enron), and, more recently, the specificity of ethical behavior and challenges in small and medium-sized enterprises (SMEs). Addressing this important knowledge gap, our study aims to investigate the way in which French micro-enterprises apply Business Ethics principles in their management philosophy, entrepreneurial orientation and market practices.

Building Community Awareness on Wasted Food Through Social Campaign Of Packaged Food Towards Sdgs 2030

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Keywords: Awareness, Packaged Food, Wasted Food, SDGs 2030

One-third, approximately 1.3 billion tons, of food is lost and wasted each year and causes drawbacks on social, economical and environmental aspects in the society. On the other hand, one out of eight people in the world, approximately 842 millions, suffers from chronic hunger. Moreover, the number of obese people is almost three times bigger than the number of hungry people, which is around 2.32 billion people. Food is the most fundamental need of humans. It therefore leads to Sustainable Development Goals (SDGs) main objective in order to alleviate poverty and hunger. Research conducted by FAO stated that if only one quarter of the lost and wasted food can be preserved, that amount of food is enough to feed 870 million starving people all over the world. One of the most impactful steps to take is education. Hence, the researchers initiated to conduct a literature study research and to analyze the online questionnaires to educate public about wasted food on packaged food. The effectiveness of social campaign can build public awareness towards wasted food was shown by the result of online survey. 77,7 % of all respondents opined that information about wasted food is important and commit not to throw food away, while 96,5 % of respondents were willing to spread the information to their surrounded people.

Guidelines to add value to old shop-houses in the Don Mueang area, Bangkok, Thailand

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Keywords: Added Value, Shop-House, Don Mueang

Im a project manager at G-ABLE Co., LTD. I received the M.S. degree in MSIT from Assumption University, Thailand. 10+ years of professional experiences in IT business and technology background gained in diverse industries; global leading IT provider, internet service provider, healthcare facilities, mobile operator, education, aviation, Banking and outsourcing Service Company. Im also running property rental business and interesting in property investment.



Assessment of A Freshman Seminar in Entrepreneurship in AACSB Accredited Program

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Keywords: Ignatian And Jesuit Pedagogy, Values, Entrepreneurship Education, Qualitative And Quantitative Analysis

Purpose: Evaluation of a early exposure to entrepreneurship for First Year Students using the Jesuit Pedagogical Model Introduction: The paper describes the content of a First Year Seminar (FYS) in Entrepreneurship and maps them onto the course goals and the mission statement of the business school and the University. The course is based on the pedagogical model that forms the basis of Jesuit higher education all over the world. The model is an early precursor to Dr. Demings PDSA (Plan, Do, Study and Act) cycle and comes from the teachings and the spiritual exercises developed by St. Ignatius of Loyola, the founder of the Society of Jesus, an order within the Catholic Church which focuses primarily on education. **Methodology:** The paper details how context, experiences, reflection and action form the core elements of pedagogy that informs the structure, content and the outcomes in a course that focuses on entrepreneurship. The course relies on a set of carefully designed experiential exercises that introduces general business concepts, and differentiates the University and the Business School from the other competitor schools by virtue of the strong focus on creating men and women for others, social justice, and cura personalis. The context of the course is significantly impacted by the fact that participants are almost all 18-19 year old men and women who are making a transition from high school to college (the seminar is a requirement for all First Year students, with topics that run the gamut of content relevant to the College of Arts and Sciences, the Business School, and the College of Professional Studies, at the University). Typical student enrolled for this course is interested in business and wants to explore the topic of entrepreneurship with some desire to have degree or a minor in the area. The experientials include simulations, service learning, and reflection and discernment as embedded components. The FYS courses are all expected to emphasize oral and written communication. The paper describes a subset of the experientials, makes the case that they have a strong links to the elements of Jesuit pedagogy. For each of the experientials described in the paper, qualitative and quantitative analysis are used to investigate how they impact goal achievement and



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meeting of the course objectives. Results: Finally, the assessment results are discussed and adjustments/additions/deletions to the exercises are recommended based on such discussion, to further improve on the quality and contents for future runs of the course. Conclusion: The experiential exercises are effective in furthering student learning and increase students understanding and acceptance of Jesuit values.

Exploring Taiwanese Adolescents Moral Philosophy Regarding Software Piracy

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Keywords: Business Ethics, Software Piracy, Ethical Judgment, Moral Philosophy

Purpose: To investigate Taiwanese adolescents perspective on software piracy. **Introduction:** In the internet age, software piracy has become an ethical issue for global business. To prevent software piracy, many governments have legislated against software piracy. Despite this prohibition, students still engage in it. We, as educators, must gain an understanding of adolescents attitudes and relative judgment regarding software piracy. This study explores adolescents (n = 341) ethical judgments regarding software piracy. Three moral philosophy perspectivesjustice, relativism, and utilitarianismwere utilized to investigate adolescents ethical judgments. **Methodology:** The survey was administered in eleven senior high schools in central Taiwan. The instrument, the moral philosophy scale, included 36 items rated on a 7-point Likert scale (1=totally disagree and 7 = totally agree). The participants read a scenario in which a student (Lin) is facing the dilemma of whether he should provide software to his close classmate, and then they answer the questions from the survey. An example of one of the items is: Lins behavior is fair. A total of 341 valid responses were collected. **Results:** On average, the students rated lowest on the justice dimension (Mean=2.55, SD=1.30) and highest on the relativism dimension (Mean=3.15, SD=1.47) **Conclusion:** By investigating senior high school students moral judgments on software piracy, this study provides suggestions for future education in internet ethics. (a) For a better understanding of students initial behaviors, students moral attitudes toward the issue could be surveyed before instruction on business ethics issues. (b) By introducing moral philosophy and moral dilemmas, the learning content of business ethics courses could be profound and more practical.

The Influence of Reverse Logistics Innovation and Reverse Logistics Performance on Resource Commitment and Reverse Logistics Cost Savings: Automotive Industry vs Automotive Aftermarket Industry

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Keywords: Reverse Logistics Innovation; Re-verse Logistics Performance; Resource Commitment; Cost Savings; Return Process

The objective of this study is to examine the influence of reverse logistics innovation and reverse logistics performance on the relationship between resource commitment and reverse logistics cost savings. The investigation was assembled with the top and middle management in Thai automotive industry and automotive aftermarket industry. A survey was conducted with 567 respondents whereas in-depth interview was gathered from 55 participants. The findings revealed that there were strong positive associations between resource commitment and reverse logistics innovation, reverse logistics innovation and reverse logistics performance, and reverse logistics performance and reverse logistics cost savings. Reverse logistics innovation and reverse logistics performance have a full mediate influence on associations of the structural model. In addition, the model is different across the size of firm, time of firm enter to industry, category of industry, and period of reverse logistics application, both level of path and structural model. Respecting qualitative investigation, enterprises implemented reverse logistics program in terms of remanufacturing, refurbishing, recondition, reuse, recycle, scrap sale, and disposing purposed to service their customer requirements rather than making benefits. Successful utilizers encompassed with higher level of management, financial, and technology commitment as well as prioritize, seriously, and continuous implementation.



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TRACK B

***ENGINEERING TECHNOLOGY, COMPUTER, BASIC &
APPLIED SCIENCES***

BLDC Motor Fault Detection Using Wavelet Transform and Neural Network

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Keywords: Wavelet Decomposition, Back Propagating Neural Network, Feature Extraction, Bayesian Regularization

This paper proposes a neural network that will detect the condition of a Brushless Direct Current (BLDC) motor and detect which fault it has. The BLDC motors that were used are a healthy motor, motor that has three holes drilled in the rotor section, and a motor that has short-circuited. The voltage signals of each type of DC motor are measured and were analyzed using Wavelet Transform. The simulated data is then trained using a back propagation neural network. The network has achieved an average of 90.46% accuracy out of 10 test sets.

Hydrophilic Modification of Polydimethylsiloxane Precursors

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Keywords: Polydimethylsiloxane; Hydrophilic; Silicone Hydrogels; Transparency

Polydimethylsiloxane (PDMS) elastomers have good biocompatibility, oxygen permeability, non-toxic, non-allergic response, transparency and thermal stability. These characteristics of PDMS have been widely used in ophthalmology and other biomedical fields, such as micro-fluidic channel, contact lenses, and artificial organs and so on. However, its high hydrophobicity limits the potential applied fields of PDMS. In our study, the PDMS precursors with epoxide and silicon siloxane (Si-OR) functional groups were modified to form the hydrophilic PDMS prepolymers by sol-gel and nucleophilic substitution reactions. The functional structures of prepolymers were verified by FT-IR, C13 - NMR and H1 -NMR spectrometers. The results showed that the Si-OR groups of PDMS precursors can be hydrolyzed and able to open the epoxide strained ring by the strong nucleophiles undergoing base-catalyzed reaction, then obtained the hydrophilic PDMS prepolymers. Mixing prepolymers and others hydrophilic monomers carried out by the UV/photo-polymerization reaction, then to obtain the silicone hydrogels with high oxygen permeability, biocompatibility and transparency. Consequently, these hydrogels are expected to be a favorable candidate in the development of future biomedical materials.

Fault Detection of Induction Motors Based on S-Transform and Back Propagation Neural Network

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Keywords: S-transform, BPNN, Feature Extraction, Fault Detection

Induction motors have an important role in many areas of electric power such as manufacturing, mining, and transportation. Therefore, fault detection and accurate analysis of the motor status is essential to avoid serious damage. In the present study, S-transform method which is a generalization of the short-time Fourier transform (STFT) is used to analyze current signals measured from four different cases including a healthy motor, broken rotor bars, bearing damage, stator winding short-circuit fault. The feature extraction process of current signal in signal analysis method is also implemented. There are many artificial intelligence techniques are used for faults classifications and achieve high efficiency. In this study, back propagation neural network (BPNN) are applied to the features to recognize motor faults. The simulation results show that the average accuracy of 10 tests is 92.9%. In conclusion, it is highly possible to detect and predict motor faults by S-transform method combined BPNN.

The 3-Year Disease-Free Survival among Breast Cancer Patients with Complete Pathological Response (Pcr) after Neoadjuvant Chemotherapy: A Matched Case-Control Study

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Keywords: Breast Cancer, Complete Pathological Response, Neoadjuvant Chemotherapy, Recurrence, Disease-Free Survival

Neoadjuvant chemotherapy is mainly used in advanced stage and large tumor size breast cancer patients. No residual invasive malignant epithelial cells or with residual invasive malignant epithelial cells in $\leq 5\%$ of the tumor mass and without mitosis in breast tumor after neoadjuvant chemotherapy is generally defined as complete pathological response (pCR), which is considered could provide advantages in breast cancer prognosis. This study purposes to determine the efficacy of pCR response in 3-year disease-free survival outcome among stage II-IV breast cancer. This retrospective study includes the breast cancer patients with neoadjuvant chemotherapy before surgery in Kaohsiung Medical hospital from January 2011 to December 2017. There were 20 pCR and 20 non-pCR subjects were included after matching the histologic grade and pretreatment clinical stage. The different of baseline characteristics and clinical variables between pCR and non-pCR subjects is estimated using Fisher's exact test. The 3-year disease-free survival of breast cancer patients was tracked from first diagnosed date to first recurrence date or the end of study, patients who lost to follow-up before the end of study were considered censored. Cox proportional hazard (PH) model was used to determine the association of neoadjuvant complete response and covariates in 3-year breast cancer recurrence. The pCR showed a significant higher proportion in younger aged below 40 years ($P = 0.037$), estrogen receptor (ER) negative ($P \leq 0.001$), progesterone receptor (PR) negative ($P = 0.001$), and human epidermal growth factor receptor 2 (HER2) positive ($P \leq 0.001$) compared to non-pCR subjects. In clinical stage II and III patients, the 3-year disease-free survival rate for pCR is 88.9% (95% CI = 43.3% - 98.4%) and non-pCR is 59.3% (95% CI = 15.7% - 86.3%), pCR shows higher disease-free survival rate compare to non-pCR. However, both groups show no statistically significant using log-rank test. While the clinical stage IV patients in pCR and non-pCR show a similar 3-year disease-free survival rate (approximate to 14%). The

multivariate Cox PH model showed pCR might have lower short-term recurrence risk (hazard ratio = 0.46, 95% CI = 0.05 3.97, P = 0.477) compared to non-pCR after adjusted for clinical covariates. This research revealed the patients with clinical stage II - III and pCR could obtained short-term disease-free survival benefit, but no similar benefit was found in breast cancer patients with clinical stage IV (metastatic breast cancer). Hence, the pCR following neoadjuvant chemotherapy might provide the protective effect in breast cancer prognosis in patients with clinical stage II- III.

Internet Addiction of Vocational High School Teenagers in Taiwan: A Cross-sectional Study

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Keywords: Internet Addiction, Internet Use Behavior, Teenager, Vocational High School

In the era of rapid technological and online development, the human-machine interaction has increased substantially, hence it has more opportunity for teenagers to use the internet in daily. In particular, the popularization and multi-application of mobile devices and wireless networks have led to extended use online, causing excessive connectivity on the internet. The widespread of social networking sites (SNS) such as online games and social media has also created a significant influence on our daily lives. This may also cause complications such as internet addiction, domestic violence, anxiety, or social dysfunction. World Health Organization (WHO) identified that excessive video-game playing which caused exclusion to daily activities, is highly associated with the internet use behavior. Previous research shows the Taiwan teenager have higher game addiction proportion compare to western country. This cross-sectional study aims to investigate the internet addiction of vocational high school teenagers in Taiwan, and determined the major factors associated to the internet addiction status. A total of 281 participants were enrolled using purposive sampling method and all the data were collected using web-based anonymous questionnaire. The questionnaire has five dimensions including addiction tolerance, compulsive internet use, internet addiction withdrawal, health management, and time management issues, which is measured by four-point Likert scale, which is used with good validity and reliability. A pathway analysis was conducted to investigate the association among five major dimensions by using linear regression analysis. The study results show that male students have a higher rate of the internet addiction than female students. The pathway analysis shows the addiction tolerance was significantly impacted the compulsive internet use ($\beta = 0.81$, $P < 0.001$), internet addiction withdrawal ($\beta = 0.83$, $P < 0.001$), and time management ($\beta = 0.72$, $P < 0.001$). In addition, the compulsive internet use ($\beta = 0.57$), internet addiction withdrawal ($\beta = 0.52$), and time management ($\beta = 0.54$) also play potential mediator role between addiction tolerance and health management. This study observed that gender,



addiction tolerance, compulsive internet use, internet addiction withdrawal, and time management issues of the participants are related to health management. The internet addiction affected health issue of teenagers can be reduced by the help of cognitive, physiology and behavioral intervention methods. Hence, further intervention program based on the significant impact factors of internet addiction health related issues should be provided in vocational high school.



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TRACK C

MEDICAL, MEDICINE AND HEALTH SCIENCES

Detecting the Significant Second Order Gene-Gene Interactions Through A Multi-Objective Approach Of Multifactor-Dimensionality Reduction

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Keywords: Classification; Multifactor Dimensionality Reduction; Multiple Objective

Many studies have proved that epistasis detection is helpful to understand the susceptibility of human genetic diseases. Numerous machine learning algorithms have been proposed, of which multifactor dimensionality reduction (MDR) is an effective epistasis detection algorithm. However, epistasis detection based on contingency tables in MDR has not been widely studied. In this study, we proposed a multi-objective MDR for the epistasis detection. We introduced the Pareto set operation to make MDR able to simultaneously adopt the multiple measures in the two-way contingency table of MDR to assess epistatic interactions, which used the correct classification rates and predictive summary index. The cross-validation consistency was adopted to determine most favourable GGIs amongst Pareto sets. Subsequently, the applications of set theory are able to choose the best epistatic interactions in k-fold cross-validation. Thus, the accuracy of MDR can be improved on epistasis identification by a multi-objective approach. Two of the MDR measures, including classification correct rate and predictive summary index, were used for the multi-objective approach. The results showed that the detection success rates of multi-objective MDR were better than that of the other MDR-based algorithms in identifying epistatic interactions. This study demonstrates that the correct classification rates and predictive summary index can effectively detect the epistasis in multi-objective MDR because the multi-objective MDR can simultaneously consider multiple measures to detect the epistatic interactions.

Survey of Health Services Satisfaction from NCD Patients in Thailand

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Keywords: NCD Patient, Patient Satisfaction, NCD Survey, Health Service

Currently, there is no existing report revealing the satisfaction of healthcare services from NCD patients in Thailand. Despite that many NCD patients have regular meeting with the doctor periodically. Therefore, our research question was that NCD patients have adequate satisfaction in the utilization of healthcare services in Thailand. The crosssection survey was conducted among 414 NCD outpatients to investigate the satisfaction of NCD patients who are obtaining NCD medication services from one of the community hospitals in northern Thailand. The satisfaction was measured by a five point rating scale through the accidental sampling. The study revealed the concurrence of NCD patients satisfied with almost all survey measures. Moreover, the expertise of the doctor and the NCD clinic location were received a high satisfaction score. In contrast, the low satisfaction from the survey is related to the time spending for waiting. Additionally, sub-group analysis showed that NCD elder patients communicated more relaxed and comfortable with the doctors. This research result from NCD patients can roughly defined the quality of public healthcare service in Thailand that is satisfied.

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