The 1st International Symposium on Artificial Intelligence for ASEAN Development (ASEAN-AI 2018)

Program Book

26-27, March, 2018

Phuket, Thailand

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ASEAN-AI 2018: Schedule at a Glance

26-March (Mon.)

	Room 1	Room 2
9:00-9:20	Opening	
9:20-10:20	Keynote 1	
10:20-10:40	Coffee Break	
10:40-11:40	Keynote 2	
11:40-13:00	Lunch	
13:00-15:30	Session 1A Long presentations	Session 1B Long Presentations
15:30-15:50	Coffee Break	
15:50-18:00	Session 2A Normal Presentations (15:50-18:00)	Session 2B Normal Presentations (16:00-18:00)
18:30-20:30	Banquet	

27-March (Tue.)

10:00-12:00	Committeesase
13:00-16:00	AI Forum (at PSU Phuket)

Presentation Schedules

Long Presentation: 20 min of presentation with 10 min of discussion
Normal Presentation: 15 min of presentation with 5 min of discussion

Session 1A (Long Presentations)   (13:00-15:30)
Chair: Hidekazu Yanagimoto (Osaka Prefecture University, Japan)
Fashion Style Mixing with Neural Networks
     Toshiki Kikuchi, Yuko Ozawa
CNN-based Superquadric Parameter Prediction via RGBD Image
     Ryo Hachiuma, Yuko Ozawa, Hideo Saito
A Framework for Bakery Product Detection Using R-CNN
     Thanathorn Phoka, Saran Nkokkeun
Learning Evaluation Functions with Neural Network for Robocup Soccer Simulation
     Takuya Fukushima, Tomoharu Nakashima, Hidehisa Akiyama
Sentiment Classification with Gated CNN
     Hidekazu Yanagimoto, Makoto Okada, Kiyota Hashimoto

Session 1B (Long Presentations)   (13:00-15:30)
Chair: Shimpei Matsumoto (Hiroshima Institute of Technology, Japan)
Detecting Learner's Hesitation by Machine Learning in Word-Reordering Problems
     Mitsumasa Zushi, Yoshinori Miyazaki, Ken Norizuki
Difficulty Estimation of Knowledge Elements in Source Codes for Reading-Based
     Programming Learning by Using Neural Test Theory
     Shimpei Matsumoto, Shuichi Yamagishi, Tomoko Kashima
Predicting Purpose of Program from Superficial Structure
     Yoshiki Mashima, Takuya Okada, Sachio Hirokawa, Kazuhiro Takeuchi
Automatic Counting of the Malaria Gametocyte Phase on Red Blood Cells
     Worakam Sirisatitwong, Narit Hnoohom
Estimation of User Attributes using LIWC and Application to SNS
     Toshiki Tomihara, Akihiro Yamashita, Katsushi Matsubayashi

Session 2A (Normal Presentations)　(15:50-18:00)
Chair: Sachio Hirokawa (Kyushu University, Japan)

Statistical Machine Translation between Myanmar Sign Language and Myanmar Sign
　　Writing (Long Presentation)
　　　Hnin Wai Wai Hlaing, Ye Kyaw Thu, Swe Zin Moe, Hlain Myat New, Ni Htwe
　　　Aung, Nandar Win Min, Hnin Aye Thant

Turning Data Generation by In-Domain Bilingual Dictionary for Domain Adaptation
　　in Neural Machine Translation
　　　Yitong Weng, Yusuke Matsubara, Koiti Hasida

Binary Classification of User Review Comments Applying Neural Attention Model
　　　Kyi Lei Wai, Kiyota Hashimoto

Internet of Things (IoT) Based Public Transportation Monitoring System　Alireza
　　　Ahrary, Fabio Papalardo, Jair Minoru Abe

Indoor Detection of Human Moves with Dynamic Time Warping
　　　Hidekazu Yanagimoto, Kiyota Hashimoto, Tokuro Matsuo

Analysis of Pyroelectric Sensor Data Installed in the Homes of Elderly Individuals
　　　Haruki Eguchi, Senri Yoshikawa, Akihiro Yamashita, Daisuke Kitakoshi, Yihsin
　　　Ho, Yasunari Hujimoto, Toru Yamaguchi, Nakoto Kanke, Tomomasa Sato

Session 2B (Normal Presentations)　(16:00-18:00)
Chair: Tomoharu Nakashima (Osaka Prefecture University, Japan)

A Comparison of Modified A* and Dijkstra Algorithms for Finding Planar Citation
　　Network
　　　Vincent T. Ciputra, Dwi H. Widyantoro

Development of an Automated Biological Tool for Gene Subnetworks Analysis
　　　Thiptanawat Phongwattana, Prissadang Suta, Panissara Thanapol, Jonathan
　　　H. Chan

Subnetwork Identification and Visualization based on Dissimilarity Gene-set Profiles
　　of Gene Co-Expressions
　　　Thanyathorn Thanapattheerakul, Narumol Doungpan, Jonathan H. Chan

An Effective Greedy Algorithm for Scheduling a Sports Training Plan
　　　Nattapon Kumyaito, Thanathorn Phoka, Kreangsak Tamee

Development of an Recommendation-Based Educational Support System for
　　English-Learning
　　　Daiki Wakayama, Tomoharu Nakashima, Tanguy Pomas

Ways of Online Learning at Binus University
　　　Ivan Kovar, Ford Lumban Gaol, Miroslava Ozvoldova

Message from General Chair

Nowadays, almost no day passes without hearing some news on Artificial Intelligence and related areas. Recent research progress on AI will push not only the progress of advanced countries but also the middle-developed and developing countries. This is all the more true for the ASEAN region, where is located countries at different developmental stages: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. AI for ASEAN development does not just mean a solution of some issues there with AI but contains a variety of AI research, development, and education. More research and development bases in ASEAN, more collaborations among ASEAN and with other countries, and more opportunities to talk and discuss various issues on AI among researchers and practitioners from ASEAN-related countries are more necessary. This is why we have launched a new series of international conference: the International Symposium on Artificial Intelligence for ASEAN Development (ASEAN-AI). This is the first of the series, and I would like to show my greatest appreciation to all people interested.

Needless to say, this first symposium was not possible without supports from many people. First I would like to show my sincere gratitude to sponsors and technical supporters: IEEE Indonesia Section, IEEE Computer Society Indonesia Chapter, IEEE Computational Intelligence Society Thailand Chapter, Artificial Intelligence Association of Thailand, International Institute of Applied Informatics, and Prince of Songkla University. Second I would like to show my appreciation to our distinguished keynote speakers: Prof. Dr. Thanaruk Theeramunkong and Dr. Prachya Boonkwan for their invaluable keynote speeches. Third I would like to say many thanks to all the organizing committee and program committee members for their professional work. Last but not least, my biggest thanks go to all the participants and authors.

Phuket is one of the world famous beach resorts in Thailand, and it is also chosen as Phuket Smart City Projects headed by the Thai government. We would like all the participants to enjoy the combination of its South-East Asian traditional atmosphere, its international population, and its endeavors towards the future.

Kiyota Hashimoto, D.Eng.
General Chair
(*Prince of Songkla University, Thailand*)

Message from Program Chair

There are already many international workshops, symposia, and conferences on Artificial Intelligence, and we need a reason to launch a new one. The aim of the International Symposium on Artificial Intelligence for ASEAN Development (ASEAN-AI) is to promote research and development on and with AI and hence to pave the way to a better society with a better quality of life particularly, but not limited to, in the ASEAN region.

This is the first of ASEAN-AI and the time was limited, but we received 32 full paper submissions from Thailand, Myanmar, Indonesia, and the Philippines, as well as from China, Japan, Czech, Brazil, and the US. After the rigorous review process with at least three double-blind peer reviews for each papers, 11 papers was accepted as a full paper with a long presentation (34%), and 11 papers were accepted as a full paper with a normal presentation (34%). For this review process, I would like to show my deepest gratitude to all program committee members for their excellent work.

We also wish to express our sincere gratitude to all the authors and participants for their contribution and support. We hope all the participants will take this opportunity to share and exchange ides among them in the natural beauty of Phuket, Thailand.

Harco Leslie Hendric Spits Warnars, Ph.D.
Program Chair
(*BINUS University,Indonesia*)

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Keynote Speech

Natural Language Processing in Thai: Past, Present and Future

Prof. Dr. Thanaruk Theeramunkong

Sirindhorn International Institute of Technology, Thammasat University, Thailand

Abstract: Processing Thai language is difficult due to its complex writing system, sophisticated phonological systems, and flexible syntactic structures, such as optional vowel marking, no word-boundary marking, no sentence-boundary marking, existence of tonal variant, flexible word composition and flexible grammar structure. So far, three comprehensive surveys on Thai language processing have been provided by Sornlertlamvanich et al. (2000) and by Koanantakool et al. (2009) and Kawtrakul and Praneetpolgrang (2014). This talk summarizes the state of the art on research and development in Thai language processing, starting from machine translation, information retrieval and information extraction, speech recognition and synthesis, optical character recognition, text categorization, text summarization, and text sentimental analysis. Moreover, three Thai corpora; a named-entity-tagged corpus, an emotional speech corpus, and a tree-bank corpus, are described and their potential applications are discussed.

Biography: Thanaruk Theeramunkong is currently a professor at School of Information, Computer and Communication Technology at Sirindhorn International Institute of Technology (SIIT) at Thammasat University, Bangkok, Thailand. He is also the Program Director of Information and Communication Technology for Embedded Systems (ICTES) at TAIST Tokyo Tech, National Science and Technology Development Agency (NSTDA), and President of Artificial Intelligence Association in Thailand (AIAT). He received his bachelor degree in Electric and Electronics Engineering, master and doctoral degrees in Computer Science from Tokyo Institute of Technology. He was a research associate at Japan Advanced Institute of Science and Technology in Japan and a MIS manager at C.P. Seven Eleven Public Co., Ltd. in Thailand. He got several awards, including the Very Good Research Award in engineering field from Thammasat University in 2008, 2009 and 2010. Recently, in 2014, he has received the National Outstanding Researcher Award in the field of Information Technology and Communication Arts. He also got several best paper awards from conferences and societies, including the Japanese Society for Artificial Intelligence, PAKDD workshops, and KICSS. In 2015, he also got a Gold Medal with the Congratulations of the Jury from the 43rd International Exhibition of Inventions of Geneva for the inventions of automatic semantic-based multi-document summarization and application to public hearing. His research interests are natural language processing, data mining, text mining, machine learning and applications to service science.

Keynote Speech

Learning with Intuitions: Semi-Supervision in Natural Language Processing

Dr. Prachya Boonkwan

(National Electronics and Computer Technology Center, Thailand)

Abstract: Machine learning plays an important role in modern natural language processing. Producing such rich linguistic resources for supervised learning is labor- and time-intensive, requiring well-trained linguists to define and annotate such linguistic structures and resolve any inconsistent annotations. Unsupervised learning has gained general interest for several decades, as it offers a possibility of building a statistical NLP module from raw text and reduces the labor of constructing linguistic resources from scratch. In this keynote speech, I will focus on how to incorporate linguistic intuitions into unsupervised learning to circumvent the issue of unexpected frequent collocation. The results on multilingual syntactic parsing show that linguistic intuitions can improve the parsing accuracy in all languages.

Biography: Prachya Boonkwan received B.Eng. and M.Eng. degrees in Computer Engineering from Kasetsart University in 2002 and 2005, respectively. He received a Ph.D. degree in Informatics from the University of Edinburgh, UK, in 2014. Since 2005, he has been working as a research for Language and Semantic Technology Lab at NECTEC, Thailand. His topics of interest include grammar induction, statistical parsing, statistical machine translation, natural language processing, machine learning, and formal syntax.

Presentation

Abstracts

Session 1A (Long Presentations)　(13:00-15:30)

1A-1 (13:00-13:30)
Fashion Style Mixing with Neural Networks
Toshiki Kikuchi, Yuko Ozawa

In this paper, we present a system generating the person image wearing the clothes of which the styles are mixed with the styles of given reference images, for each category of clothes. The system uses the method based on color matching function and neural style transfer. We call the system "fashion style mixing". Our experimental results show that our method transferred the style of the clothes better than other baseline methods.

1A-2 (13:30-14:00)
CNN-based Superquadric Parameter Prediction via RGBD Image
Ryo Hachiuma, Yuko Ozawa, Hideo Saito

Superquadrics represent various types of primitive shapes in a single equation with several parameters. Superquadric parameters of an object is estimated from 3D point cloud. However, the task of superquadric parameter estimation is computationally expensive and it is unacceptable for robot applications. Therefore, the concept of our research is to predict superquadric parameters directly from an image. We apply regression Convolutional Neural Network (CNN) that predicts parameters from images to superquadric parameter estimation. Moreover, we use not only depth but also RGB image to predict superquadric parameters for improve the accuracy of prediction. Experiments show that proposed CNN with the input of RGB-D image predicts more accurate parameters than baseline methods.

1A-3 (14:00-14:30)
A Framework for Bakery Product Detection Using R-CNN
Thanathorn Phoka, Saran Nkokkeun

This paper proposes a framework that applies RCNN for detecting bakery products appeared in an image. The framework consists of three main procedures which are bakery product data generation, training and testing an R-CNN model. Image processing is applied to the data generation procedure. The procedure begins with obtaining bakery product images that each image has a single known bakery product up on a specific background color then the bakery product is extracted from the image. The extracted images are then used to generate training data and testing data by a data augmentation and an image placement. The trained R-CNN model can then be used to localize and classify bakery products in a test image. The experimental results will show that the trained R-CNN can detect and classify bakery products with high accuracy.

1A-4 (14:30-15:00)
Learning Evaluation Functions
with Neural Network for Robocup Soccer Simulation
Takuya Fukushima, Tomoharu Nakashima, Hidehisa Akiyama

The aim of this paper is to construct an evaluation function, that is used for decision making, by using supervised and reinforcement learning. To do so, four-layered neural networks are employed to model the evaluation function. For the training of neural networks, we generate training data sets from game logs, and define the success episodes. First, the parameters of neural networks are learned by supervised learning. Then, reinforcement learning is applied to fine-tune the neural networks. In the experiments, we investigate the performance of neural networks tuned by supervised and reinforcement learning. As a result, it is shown that the performance of the trained neural networks is the same as ones with hand-coded rules.

1A-5 (15:00-15:30)

Sentiment Classification with Gated CNN

Hidekazu Yanagimoto, Makoto Okada, Kiyota Hashimoto

Binary sentiment classification is a topic that has been investigated, and deep neural networks have recently been applied. This paper applies Gated CNN to binary sentiment classification. The original Gated CNN is applied to generating a language model and achieves almost the same performance with LSTM. Gated CNN, as similar to LSTM but unlike CNN, includes feature selection according to each target label as well as feature generation. Instead of generating a language model, our proposal is to apply Gated CNN to feature generation and selection from text. For this purpose, our proposed Gated CNN includes a maximum pooling layer to generate the final feature vector to represent each input datum. We evaluate our proposed method with two different text datasets: short Twitter tweets and long Amazon product reviews. The results show that our proposed method, even when no tuning is made, achieves the highest performance for short Twitter tweets, and the same performance for Amazon product reviews to the baseline SVM method, suggesting that Gated CNN can be employed effectively not only for language model generation but also for classification and other tasks.

Session 1B (Long Presentations)　(13:00-15:30)

1B-1 (13:00-13:30)

Detecting Learner's Hesitation
by Machine Learning in Word-Reordering Problems
Mitsumasa Zushi, Yoshinori Miyazaki, Ken Norizuki

The aim of our present research is to develop a Web application to apprehend when learners hesitate in the process of solving English word-reordering problems. Measurements of learners' hesitation can be an important clue to ascertain learners' understanding level. In this research, we assume that the task of classifying study logs into "hesitating" and "not hesitating" labels is a reliable and valid way to detect the presence or absence of hesitation, and adopt a supervised learning technique in machine learning. Parameters of mouse behavior (e.g., mouse speed, time needed for a drag-and-drop, and distance of mouse movements) are used as features for classification. Our newly constructed classifier classified the study logs, collected from the experiment with 27 learners, into two labels with quite high precision, indicating the possibility to locate where hesitation occurs in the problem-solving process and to help both learners intending to improve their English and onsite teachers seeking their teaching strategies.

1B-2 (13:30-14:00)

Difficulty Estimation of Knowledge Elements in Source Codes for Reading-Based Programming Learning by Using Neural Test Theory

Shimpei Matsumoto, Shuichi Yamagishi, Tomoko Kashima

The authors have developed a source code reading-based programming learning system. The primary target of this system is novice programming learners. In this system, learners first read a few lines of source code. After the reading, the learners answer the value of variables when the program terminates. This learning aims to develop a habit of being conscious of program structure such as data dependence relationship when reading the source code and obtain the ability to read the program as well which can reduce non-essential cognitive load (extraneous load) as much as possible. The objective of this study is to analyze the learning log data of this source code reading-based programming learning system by using neural test theory and estimate the difficulty level of each knowledge element. Knowledge elements are, for example, branch, loop, compound assignment operation, and increment/decrement. The analysis result suggested the high difficulty of loop and increment/decrement for reading.

1B-3 (14:00-14:30)
Predicting Purpose of Program from Superficial Structure
Yoshiki Mashima, Takuya Okada, Sachio Hirokawa, Kazuhiro Takeuchi

As a common and fundamental technology in the software engineering and the programming learning, it is important to develop a method for knowing the purpose to be achieved by algorithms and methods adopted in a certain program. In this paper, we discuss a way to make a superficial abstraction of structure of programs in order to predict the purposes of programs. The key to predict such a purpose is to find patterns in which expert programmers and programming teachers interpret the purpose of a particular program empirically. In particular, we examine automatic estimation of the purposes of programs adopting two machine learning methods: one is the neural network (NN) and the other is the support vector machines (SVM). We employ the autoencoder that is constructed with NN to acquire an adequate vector space in which characteristics of superficial program structure are mapped. In order to verify whether the vector space showing the features of the program acquired by our autoencoder is appropriate, we perform feature extraction using SVM. In this way, we estimated the elements that an autoencoder should use to represent programs in the vector space.

1B-4 (14:30-15:00)
Automatic Counting of the Malaria Gametocyte Phase on Red Blood Cells
Worakam Sirisatitwong, Narit Hnoohom

This research presents a novel method for detecting malaria in human blood. The work used motion images of blood samples without staining with Giemsa stain to reduce the need for slide preparation and increase the diagnostic speed. The researchers focused on *Plasmodium falciparum*, which has the highest number of fatalities and is heavily widespread by identifying its adhesive interactions of infected cells whereby the infected cell becomes adhesive to another cell. The method used detected rosetting that caused cell autoagglutination. From the results, the method could detect the *P. falciparum* infected red blood cells and was able to assist the microscopist in screening the location of the infected cell in the blood's film. The researchers algorithm was lightweight and fast, which would reduce the load on film preparation.

1B-5 (15:00-15:30)
Estimation of User Attributes using LIWC and Application to SNS
Toshiki Tomihara, Akihiro Yamashita, Katsushi Matsubayashi

Users of social networking services (SNSs) have recently widely increased; hence, SNSs are expected to be utilized for marketing. Accordingly, narrowing down the target users among all users with various hobbies, occupations, and personality is an important task. However, the profile criteria have not been tightened, and judging user attributes only with that information is difficult. Linguistic Inquiry and Word Count(LIWC) is a tool for abstracting and categorizing vocabularies, which is suitable for user attribute estimation. Many languages are not supported by LIWC, including languages of Asian countries. The Japanese version of LIWC has not been published; hence, we propose herein a method of user attribute estimation using the Japanese LIWC semi-automatic translation of the English version. A user attribute estimation is performed, and the effectiveness of the attribute estimation is confirmed with the Japanese LIWC.

Session 2A (Normal Presentations)   (15:50-18:00)

2A-1 (15:50-16:20: Long Presentation)
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Statistical Machine Translation
between Myanmar Sign Language and Myanmar Sign Writing
Hnin Wai Wai Hlaing, Ye Kyaw Thu, Swe Zin Moe, Hlain Myat New, Ni Htwe Aung,
Nandar Win Min, Hnin Aye Thant

</div>

This paper contributes the first evaluation of automatic machine translation between Myanmar Sign Language (MSL) and Myanmar SignWriting (MSW). The main motivation is to introduce SignWriting to the Myanmar Deaf society with the help of statistical machine translation. In this paper, we use our MSL-MSW corpus for general domain that contains a textual representation of MSL and its equivalent Myanmar SignWriting. The methods studied in this work were phrase-based, hierarchical phrase-based and the operation sequence model. In addition, two different segmentation schemes were studies, these were syllable segmentation and word segmentation for MSL. The performance of the machine translation systems was automatically measured in terms of BLEU and RIBES for all experiments. Our main findings were that operation sequence model gave the highest scores (37.54 BLEU and 0.8280 RIBES) for MSL to MSW translation and hierarchical phrase based machine translation gave the highest scores (52.79 BLEU and 0.8756 RIBES) for MSW to MSL translation. Generally, translation with word segmented MSL achieved better performance than syllable segmentation of MSL. Our 10-fold cross validation results produced promising results even with the limited training data and we expect this can be developed into a useful machine translation system as more data becomes available in the future.

2A-2 (16:20-16:40)

Turning Data Generation by In-Domain Bilingual Dictionary
for Domain Adaptation in Neural Machine Translation
Yitong Weng, Yusuke Matsubara, Koiti Hasida

A method of generating bilingual data for fine-tuning in Neural Machine Translation is proposed. Replacement is conducted between the entries of an in-domain bilingual dictionary and words that are similar to them in the given original data. Experiments show that the method succeeds in expanding a set of in-domain data by adding sentences pairs generated with itself and an in-domain dictionary.

2A-3 (16:40-17:00)

Binary Classification of User Review Comments
Applying Neural Attention Model
Kyi Lei Wai, Kiyota Hashimoto

Customer review sentiment analysis, classification of customer reviews into positive and negative polarities, has been extensively investigated, but it is still an issue because the language used contains spelling variations, mistakes, and colloquial expressions and because longer reviews contain both overall and partial evaluations. Instead of a bag-of-words model, we propose an application of automatic summarization as a preprocess to the main classification task. Our proposal employs automatic summarization with recurrent neural network with an attention mechanism. We used Amazon customer reviews consisting of text reviews, one-line summaries, and overall rating of five scales. Our model first employs automatic summarization using text reviews and corresponding one-line summaries, which is an encoder-decoder model. The obtained context tensor, after flatting, is then used as the input of classification. We employed Naive Bayes, Decision Tree, and Support Vector Machines for classification. We conducted evaluative experiments, and achieved the highest result with the combination of recurrent neural network with an attention mechanism and Support Vector Machines.

2A-4 (17:00-17:20)
Internet of Things (IoT) Based Public Transportation Monitoring System
Alireza Ahrary, Fabio Papalardo, Jair Minoru Abe

Many systems have been used to monitoring public transport, especially urban bus systems. In general, most of the existing systems are dedicated and therefore costly. In this paper, we propose a new IoT based public transportation monitoring system that can be connect to all existing hardware inside of bus and connect easily to cloud server via 4G-LTE. We also take the advantage of IoT parts of proposed system to add many other functions, such as internal vehicle temperature, possible route change, driver control, user data and so on. Such data can be used for the management of the public transportation itself, as well as provide data that can be used by public managers, private sections and local government.

2A-5 (17:20-17:40)
Indoor Detection of Human Moves with Dynamic Time Warping
Hidekazu Yanagimoto, Kiyota Hashimoto, Tokuro Matsuo

This paper proposes a new method of indoor detection of human moves using improved dynamic time warping. In the improved method a new parameter is introduced to restrict correspondence between two sequential data because the method can consider missing values. Moreover, distance which are calculated with the improved dynamic time warping is normalized by the number of correspondence observations because a sequential data with a few observations tends to be similar to other sequential data. in experiments we calculate distances between all pairs of conference participants and the proposed method can find a pair of participants who move together.

2A-6 (17:40-18:00)

Analysis of Pyroelectric Sensor Data Installed in the Homes of Elderly Individuals

Haruki Eguchi, Senri Yoshikawa, Akihiro Yamashita, Daisuke Kitakoshi, Yihsin Ho, Yasunari Hujimoto, Toru Yamaguchi, Nakoto Kanke, Tomomasa Sato

Japan has the largest population of elderly citizens among all Asian countries. The elderly population is increasing and is becoming a serious problem. In this paper, we analyze sensor data from monitoring systems used by elderly citizens living alone. We aim to investigate how the accumulated data on individual behaviors can be effectively utilized for forecasting and estimating the current state of dementia and its progression. We used data from pyroelectric sensors installed in the homes of eleven elderly citizens who were living alone. Additionally, a weekly log of call center data during the same period was also used. Since the sensors were gathering data over multiple years at the elderly home, noise and missing data was prevalent due to various factors. Based on these factors, we present characteristic examples that appear in the sensor data. We then provide proposals on where to install the sensors. We also describe the classification results of individual dementia progression using convolutional neural network.

Session 2B (Normal Presentations)   (16:00-18:00)

2B-1 (16:00-16:20)
A Comparison of Modified A* and Dijkstra Algorithms for Finding Planar Citation Network
Vincent T. Ciputra, Dwi H. Widyantoro

In citation network, literatures are often represented as vertices and citations as edges in a graph. For citation network visualization, intersecting edges could degrade the graph esthetic and make it difficult to understand the relation among nodes (papers) in the graph. A planar version of the graph will help resolve this problem. In this paper, we discuss two algorithms for generating a planar graph from a citation networks. These algorithms are based on A* and Dijkstra algorithms. The algorithms will find a path for the edges so that the graph will be a planar graph. Based on our experiments, we conclude that the modified A* algorithm is a more suitable algorithm. It generates a comparable planar graph with the Dijkstra algorithm, but it is faster in generating the graph.

2B-2 (16:20-16:40)
Development of an Automated Biological Tool for Gene Subnetworks Analysis
Thiptanawat Phongwattana, Prissadang Suta,
Panissara Thanapol, Jonathan H. Chan

We present an automated biological tool in order to visualize gene co-expression from a gene expression dataset. There are 2 aspects in our motivation comprising an automated biological tool and algorithms that can be utilized for researchers who are interested in this area because it can help to save time in the data preparation stage. This work combines all of the necessary processes to provide an automated tool. Furthermore, our automated tool provides a means of clustering visualization in each biological pathway, as well as how gene dissimilarity is linked to the mutual significance of gene pairs within a gene-set that can help researchers in relevant fields in their research work.

2B-3 (16:40-17:00)
Subnetwork Identification and Visualization based
on Dissimilarity Gene-set Profiles of Gene Co-Expressions
Thanyathorn Thanapattheerakul, Narumol Doungpan, Jonathan H. Chan

A novel approach for biomarkers identification based on gene-set profile visualization is proposed. We hypothesized that ranked gene-set profile will give a meaningful visualization for functional analysis. Our proposed method calculates the dissimilarity distribution in the gene-set by using Topological Overlap Measure algorithm in the WGCNA package. This grouped profile analysis is then used with functional analysis tools to identify potential subnetwork biomarkers for a disease of interest. A case study with lung cancer is illustrated. The results show that the gene-set profile based on dissimilarity measure may be able to identify subnetwork biomarker.

2B-4 (17:00-17:20)
An Effective Greedy Algorithm for Scheduling a Sports Training Plan
Nattapon Kumyaito, Thanathorn Phoka, Kreangsak Tamee

Greedy algorithm is the technique that has been applied to solve a scheduling problem. Its advantages are the ease of implementation and overall performance. The problem that is able to applied by greedy algorithm should have solution's structure that is able to broken down into sub structures. Greedy algorithm always makes choice on the locally optimal sub solution and iterates to find the globally optimal complete solution. In this paper, the problem of scheduling a sport training plan was studied. Greedy algorithm makes the best choice by objective valued which evaluated by the Banister's training-performance interaction model. In addition, the constraint handling method also involved in the making choice processes. The result shown that greedy algorithm can generate a training plan that risen high athletic performance.

2B-5 (17:20-17:40)

Development of an Recommendation-Based Educational Support System for English-Learning

Daiki Wakayama, Tomoharu Nakashima, Tanguy Pomas

In the educational area, there has been an increasing interest in developing innovative learning systems that adapt itself by analyzing users' learning experiences. That is the case of e-learning systems like Moodle, for which improvements have been reported by several researchers. However, most of them are just only improving systems that do not adapt themselves to the user. This paper presents a new educational support system that recommends questions based on users' learning experiences. The proposed system adopts the idea of recommender system. Computational experiments were conducted to define the most suitable model for recommendation. To evaluate the proposed system, we collect data from students. After that, we compute MAE, RMSE and excution time for several models to find out which model should be incorporated to the proposed system.

2B-6 (17:40-18:00)

Ways of Online Learning at Binus University

Ivan Kovar, Ford Lumban Gaol, Miroslava Ozvoldova

Current trends bring real challenges for new ways of online education. The paper presents learning concept at Binus University in Jakarta, Indonesia and the results of a pilot survey about the use of Binusmaya, the learning management system. This paper briefly analyses also learning management system MOODLE, which is used at Tomas Bata University in Zlin, Czech Republic, with its peculiarities. Upcoming part deals with a Binusmaya questionnaire and interview because users experience are the most valuable and important for improving learning management system. The aim of our work is to improve online learning, especially at BINUS University. Discussion and an evaluation as the results of our research are presented.

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