Program Book

The 14th International Joint Symposium on
Artificial Intelligence and Natural Language Processing
(iSAI-NLP 2019)

About this Publication

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Contents

Welcome Message from the iSAI-NLP 2019 General Chairs

Welcome all presenters, participants, and contributors to the Fourteenth International Joint Symposium on Artificial Intelligence and Natural Language Processing (iSAI-NLP 2019) held at Chiang Mai, Thailand from 30

October 2019 to 1 November 2019. We would like to show our sincere gratitude to your great corporation and contribution to iSAI-NLP 2019.

iSAI-NLP, formerly called SNLP until 2016, has survived for 26 years in this fast developing research area of Natural Language Processing and Artificial Intelligence in general. The First SNLP was held in Bangkok, hosted by Chulalongkorn University, in 1993, aiming to promote and improve Thai, though not limited to it, research on natural language processing. Since then, subsequent symposia were held by Kasetsart University in Bangkok (1995), Asian Institute of Technology in Phuket (1997), King Mongkut's University of Technology Thonburi in Chiang Mai (2000),SIIT,Thammasat University in Hua Hin(2002), Chulalongkorn University in Chiang Rai(2005),Kasetsart University in Pattaya(2007), Dhurakij Pundit University in Bangkok(2009), King Mongkut's Institute of Technology Ladkrabang in Bangkok(2011), SIIT in Phuket(2013), Thammasat University in Ayutthaya(2016), King Mongkut's University of Technology Thonburi and Rangsit University in Hua Hin(2017), and Mahidol University in Pattaya(2018). Following this long tradition, iSAI-NLP2019 is hosted by Muban Chombueng Rajabhat University, the Center of Excellence in Community Health Informatics, Chiang Mai University, Sirindhorn International Institute of Technology, Thammasat University, Thammasat University, Mahidol University, National Electronics

and Computer Technology Center (NECTEC), and Artificial Intelligence Association of Thailand (AIAT).

According to the recent flourishment of a variety of research on AI and NLP, iSAI-NLP 2019 holds five tracks: Natural Language Processing; Robotics, IoT and Embedded System; Data Analytics and Machine Learning; Signal, Image and Speech Processing; and Smart Industrial Technologies, together with the co-located International Exhibition of Inventions of Thailand (IEIT2019). Thus iSAI-NLP 2019 covers all important topics in AI and NLP.

We would like to express our sincere appreciation to our sponsors and supporters for their valuable supports, particularly Phetchaburi Rajabhat University, Electricity Generation Authority of Thailand, iApp Technology, and IEEE Thailand Section; three distinguished keynote speakers for their invaluable talks, Addoc. Prof. Dr. CharturongTantibundhit, Dr. Ryota Yamanaka, and Prof. Dr. Hiroaki Oagata; all organizing committee members for their hard work; and most importantly all presenters and participants for their research presentations and discussions.

We hope that iSAI-NLP 2019 will the place again to know the frontier of AI and NLP research, to meet new acquaintances, to reunite old friends, and to enjoy active research discussion in a famous cultural city of Chiang Mai, Thailand. See you all there.

October 2019

The iSAI-NLP 2019 General Co-Chairs

ThanarukTheeramunkong

(SIIT, Thammasat University, Thailand)

ThepchaiSupnithi

(National Electronics and Computer Technology Center, Thailand)

Kiyota Hashimoto

(Prince of Songkla University, Thailand)

Welcome Message from the iSAI-NLP 2019 Program Chairs

On behalf of the Technical Program Committee, we are pleased to welcome you to the 2019 edition of International Joint Symposium on Artificial Intelligence and Natural Language Processing (iSAI-NLP). iSAI-NLP 2019 is the fourteenth conference in the series of the international symposium on NLP (SNLP) started in 1993. This year, it is held in Chiang Mai, Thailand from October 30th to November 1st in conjunction with the 1st International Exhibition of Inventions of Thailand 2019 (IEIT 2019). We hope the participants of both events, iSAI-NLP and IEIT, to have a great time for intellectual exchange in Chiang Mai.

iSAI-NLP 2019 has 5 tracks namely NLP; Robotic, IoT and Embedded System; Data Analytic and Machine Learning; Signal, Image and Speech Processing; Smart Industrial Technologies. We have received 79 submissions from various countries including Thailand, India, The Philippines, USA, China, Bangladesh, and Japan. All the submissions are rigorously reviewed by at least three anonymous reviewers, and finally we have accepted 69 submissions; 49 regular papers and 20 short papers. This builds up to 88% acceptance rate. To this end, we would like to express our gratitude to all reviewers that spent their valuable time reviewing and evaluating the submitted papers.

This year, we are pleased to have three interesting keynote speakers namely Associate Professor CharturongTantibundhit, Dr. Ryota Yamanaka and Professor Hiroaki Ogata. We are honored by their presence. We would also like to express our sincere gratitude to our honorary co-chairs Professor Vilas Wuwongse, Professor Yoshinori Sagisaka, Assistant Professor ChairitSiladech and Professor Nicolai Petkov. The organization of this conference would be different

without their invaluable advice and support. Furthermore, we would like to show our appreciation to the iSAI-NLP team that worked hard to organize this conference. This includes our general co-chairs, Professor ThanarukTheeramunkong, Dr. ThepchaiSupnithi, and Dr. Kiyota Hashimoto; publication co-chairs, ThodsapornChay-intr, JiragornChalermdit, and NawaratWittayakhom; technical programs chairs of all tracks; the organizing committee members, international committee members, financial co-chairs, and secretary generals. Moreover, we would like to thank our hosts, co-hosts, and local-host: Artificial Intelligence Association of Thailand (AIAT), MubanChombuengRajabhat University (MCRU, Thailand), Thammasat University (TU, Thailand), Sirindhorn International Institute of Technology (SIIT, TU, Thailand), Mahidol University (MU, Thailand), National Electronics and Computer Technology Center (NECTEC, Thailand), and Center of Excellence in Community Health Informatics, Chiang Mai University (CMU, Thailand). In addition, we would like to thank all sponsors for their generous support.

Last but not least, we would like to express our greatest gratitude to all the authors who have submitted their valuable works, to those who join the conference and to all other iSAI-NLP participants. Thank you for your effort, for your time, and kindness.

October 2019

The iSAI-NLP 2019 Program Co-Chairs

SanparithMarukatat

(National Electronics and Computer Technology Center, Thailand)

ItsuoKumazawa

(Tokyo Institute of Technology, Japan)

Welcome Message from the iSAI-NLP 2019 Organizing Committees

It is our great honor that the 14th International Joint Symposium on Artificial Intelligence and Natural Language Processing (iSAI-NLP 2019) at the Kantary Hills Hotel, Chiang Mai, Thailand during October 30-November 1, 2019. The iSAI-NLP 2019 will trigger an opportunity for professors, researchers, practitioners, junior researchers, and students to exchange ideas, methods, insights, and current research progresses. Hosted by MubanChombuengRajabhat University with great support from Artificial Intelligence Association of Thailand (AIAT).

The response to our initial call for paper was overwhelming with more than 80 papers submitted from 12 countries. After rigorous review of all the papers by at least three expert reviewers each, 48 papers were accepted for presentation with an acceptance ratio of about 60 percent. We have organized the program into a number of technical sessions, keynote presentations, and tutorials. The technical sessions cover a wide range of topics related to natural language processing, robotics, IoTand embedded system, data analytics and machine learning, signal, image and speech processing and smart industrial technologies.

The conference will be preceded by four major tutorials on October 30. The first tutorial will be given by Prof.Dr. Hiroaki Ogata, on "Connecting formal and informal learning through learning evidence and analytics framework." while the second tutorial will be given by Dr. Ryota Yamanaka, from Oracle Corporation, Thailand, on "DNA sequence analysis and its reproducible platform, Network analysis and semantic technologies".The Third is given by Prof.Dr.Itsuo Kamazawa,

on –Evaluation of deep learning techniques for detecting lesion areas in MRI and X ray images,‖and the last will be given by Assistant ProfessorDr.CharturongTantibundhit, on "Artificial Intelligence for Medical Screening: Research and Innovation in Low-resource Settings".

As chair of the organizing committee, we would like to express our sincere appreciation to all committeemembers, presenters, reviewers, organizing teams, including secretariesand staffs, for their dedication and hard work behind the scene tomake this a truly successful international conference. We sincerely hopethat all of you enjoy this remarkable event. We look forward to seeingand discussing with you at the iSAI-NLP 2019.

October 2019

The iSAI-NLP 2019 Organizing Co-Chairs

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Track 4

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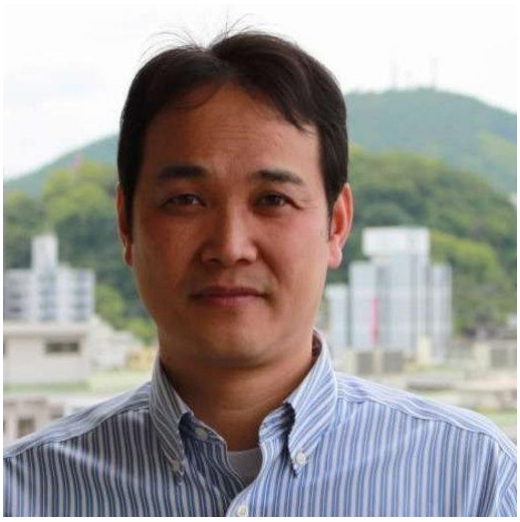
Keynote/Invited/Guest Speakers

iSAI-NLP 2019keynote Speaker



Professor. Dr. Hiroaki Ogata
Professor, Academic Center for Computing and Media Studies, and the Graduate School of Informatics, Kyoto University

Title of the talk : Connecting formal and informal learning through learning evidence and analytics framework

Abstract:
The multi-disciplinary research approach of Learning Analytics (LA) has been providing methods to understand learning logs collected during varied teaching-learning activities and potentially enrich such experiences. However, LA is mainly focusing on formal learning in classrooms. This talk will explain how technology can help to entwine formal and informal learning and to extract evidence of effective teaching-learning practices by applying LA and developing novel techniques. It focuses discussions on realizing a technology enhanced evidence-based education and learning (TEEL) system. This talk will propose the Learning Evidence Analytics Framework (LEAF) and draw a research roadmap of an educational big data driven evidence-

based education system. Teachers can refine their instructional practices, learners can enhance learning experiences and researchers can study the dynamics of the teaching-learning process with it. While LA platforms gather and analysis the data, there is the lack of a specific design framework to capture the technology enhanced teaching-learning practices. Finally, this talk will present the research challenges to smart evidence-based education.

Research Interests : Learning Analytics, Educational data science, evidence-driven education

Bibliography :

Hiroaki Ogata is a Professor at the Academic Center for Computing and Media Studies, and the Graduate School of Informatics, Kyoto University, Japan. His research includes Computer Supported Ubiquitous and Mobile Learning, CSCL, CSCW, CALL, and Learning Analytics. He has published more than 300 peer-reviewed papers including SSCI Journals and international conferences. He has received several Best Paper Award and gave keynote lectures in several conferences.

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iSAI-NLP 2019 keynote Speaker

Ryota Yamanaka
Senior Solutions Consultant (Big Data & Analytics),
Oracle Corporation Thailand

Title of the talk : Graph Database for AI

Abstract:
Graph database is one of the emerging database management systems, whose data model is based on mathematical graph, consists of nodes and edges. Because of its capability to represent complex data, graph database is expected to become a new data management platform in AI fields. In machine learning, since graph data is a rich data source to train predictive models, new methods are recently proposed to take graph data as input of machine learning. Graph database provides graph data for such algorithms as well as generates graph-based features for conventional algorithms. In semantic web, more information has become available in the form of knowledge graphs. Graph database is suitable to populate such graph data keeping its semantic information, and it enables us to run high-response queries

as well as graph-based algorithms to analyze the data. In this talk, I will present the introduction of graph database and its usage in AI systems. I will also discuss its actual use cases from industrial perspective.

Keywords: Graph Database, Machine Learning, Semantic Web

Research Interests : DNA sequence analysis and its reproducible platform, Network analysis and semantic technologies.

Bibliography:

Dr. Ryota Yamanaka is a senior solutions consultant in big data & analytics at Oracle Corporation Thailand. He received his bachelor's degree in computer science from Tokyo Institute of Technology (2007), his master's degree in bioinformatics from King's College London (2011), and his PhD in genome science from The University of Tokyo (2015). He also worked as a database consultant for Oracle Corporation Japan, during 2007 - 2010. His interest includes bioinformatics, database, and semantic web.

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iSAI-NLP 2019 keynote Speaker

Professor. Dr. Itsuo Kamazawa
Laboratory for Future Interdisciplinary Research of Science and Technology,
Institute of Innovative Research Tokyo Institute of Technology

Title of the talk : Advanced in Human-Computer Interface

Abstract:

This talk is related to technologies for human interface with a few demonstrations. Thesetechnologies are applied to gaming including serious games, virtual reality and any situation where human and machine interaction is needed. Talks and demonstration with collaborating students in the ultrafast image sensing to minimize latency in generating feedback for virtual reality system. Compared to the original method, the innovative device for image sensing that combines the ultrafast optical image sensor that is used in the computer mouse and the Leap Motion to detect the very quick motion of the human hand and the fingers. This technique is essential to improve the reality and usability of virtual reality applications. The talk also includes brain machine interface to control machines or

systems by brain activities, and haptic technologies with haptic sensing and feedback devices to provide realistic information. Several demos are provided to facilitate fruitful discussions on multimodal human-computer interfaces in gaming context.

Keywords: Artificial Neural Networks, Human Interface, Pattern Recognition, and Image Processing

Bibliography:

ItsuoKumazawa received Bachelor of Engineering in Electrical and Electronic Engineering from Tokyo Institute of Technology (TIT) in 1981, Master of Engineering, and Doctor of Engineering in Computer Science from Tokyo Institute of Technology (TIT) in 1983, and 1986, respectively. In 1986, he started his academic career as Assistant Professor in TIT, where he became Associate Professor in 1990. Currently, he is a Professor in the Institute of Innovative Research at TIT. Dr. Kumazawa has published research papers in the fields of Artificial Neural Networks, Human Interface, Pattern Recognition, and Image Processing. He received grants from JSPS, JST and a number of private funds. He is a member of IEICE, IPSJ, ITE and IEEE and received awards from these academic societies such as the “best demo award” in the IEEE virtual reality conference in 2013.

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Prof. Dr. ItsuoKamazawa

Imaging Science and Engineering Research Center

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iSAI-NLP 2019 keynote Speaker

Charturong Tantibundhit

Associate Professor (Department of Electrical and Computer Engineering), Thammasat University

Title of the talk : Artificial Intelligence for Medical Screening: Research and Innovation in Low-resource Settings

Abstract:

Artificial Intelligence (AI) has been applied to a lot of medical applications especially for disease screening and diagnosis. One objective is to support medical staffs especially in developing countries, where medical experts and resources are very limited. As a result, patients can have medical screening and can receive medical treatment on time reducing disability and loss of life. Our research group, emphasized in AI in medicine, have collaborated on interdisciplinary research and development of medical innovations using resources available in Thailand. Our ultimate goal is to facilitate physicians, public health officers, and people in medical screening

and diagnosis, focusing on the major diseases, e.g., stroke, Alzheimer's, learning disability, diabetic retinopathy, aged-macular degeneration, glaucoma, cytomegalovirus retinitis, cervical cancer, skin cancer, lung cancer, and tuberculosis that are affecting majority people around the world. Based on our continuous dedication for more than 10 years, we have developed a lot of innovative medical products with world class quality. These innovations have high impacts resulting in the better quality of life of Thai people. Our research work and innovations have been perceived as one of the best research groups in Thailand as shown by awards received nationally and internationally. Moreover, our research group is only one that won the Grand Prize in International Exhibition of Inventions of Geneva, Switzerland recognized as the world's largest exhibition of inventions. Finally, our research work and innovations have been published in the world leading international journals.

Research Interests: Speech Enhancement, Tonal-speech Perception, Signal 6Processing for Cochlear Implants, Pattern Recognition and Machine Learning

Bibliography :

CHARTURONG TANTIBUNDHIT received the B.E. degree in electrical engineering from Kasetsart University, Bangkok, Thailand, in 1996, and the M.S. degree in information science and Ph.D. degree in electrical engineering from the University of Pittsburgh, Pittsburgh, PA, USA, in 2001 and 2006, respectively. Since 2006, he has been with Thammasat University, Thailand, where he is currently an Associate Professor with the Department of Electrical and Computer Engineering and the Head of the Speech and Language Technology Cluster, Center of Excellence in Intelligence Informatics, Speech and Language Technology, and Service Innovation. From 2007 to 2008, he was a Post-Doctoral Researcher with the Signal Processing and

Speech Communication Laboratory, Graz University of Technology, Graz, Austria. He was an IEEE ICASSP Student Paper Contest Winner in 2006. He led a team to win the Grand Prix of the 45th International Exhibition of Inventions of Geneva in 2017. His research interests include handcrafted machine learning and deep learning in medicine, biomedical signal processing, and speech processing.

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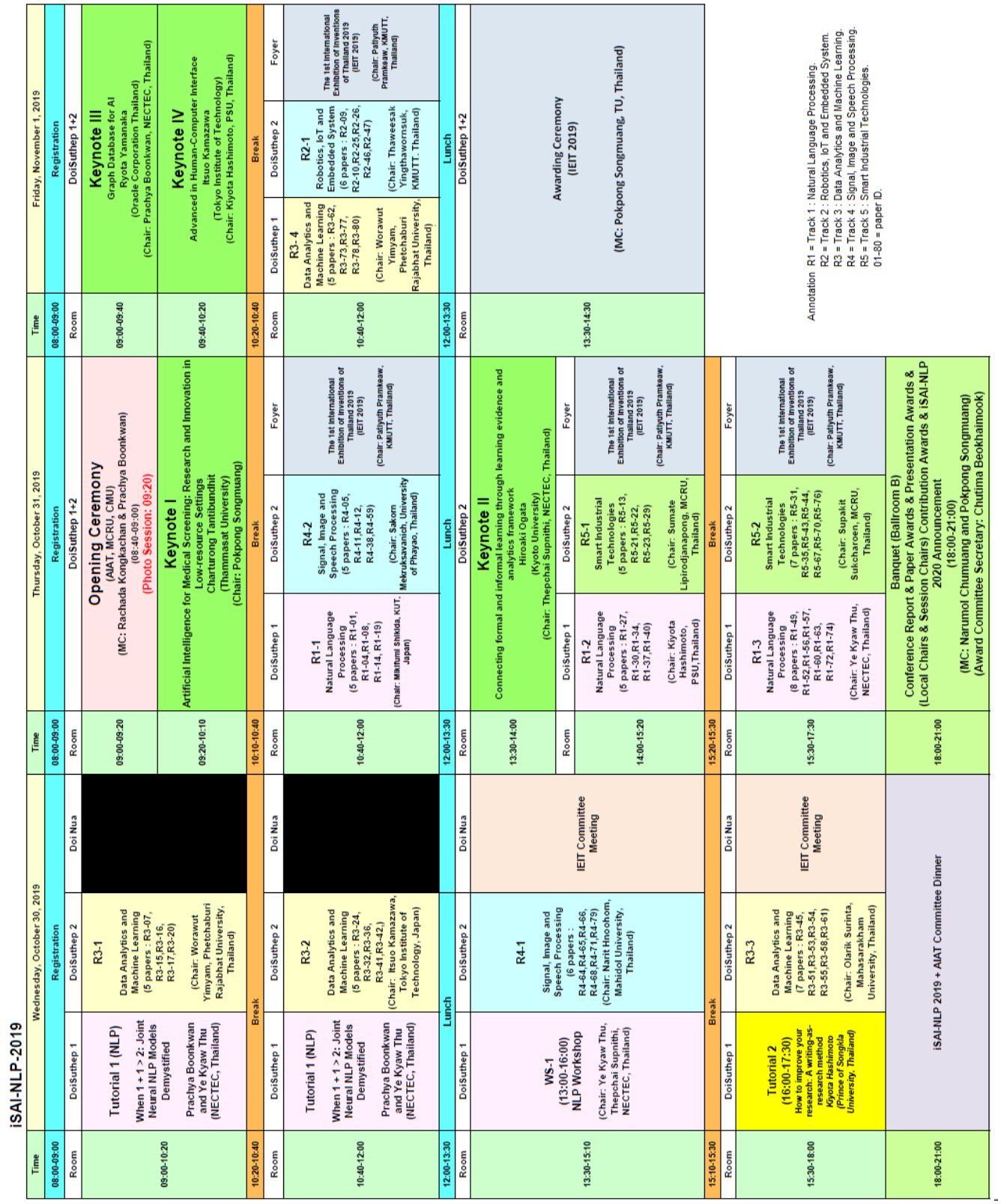
conference Overall Schedule



Track 1 : Natural Language Processing.

No.	Session	Paper ID: Paper Title
1	R1 group 1	R1-01 The First Wikipedia Questions and Factoid Answers Corpus in the Thai Language
2	R1 group 1	R1-04 Descriptive Feedback on Interns' Performance using a text mining approach
3	R1 group 1	R1-08 Semantic Enhancement and Multi-level Label Embedding for Chinese News Headline Classification
4	R1 group 1	R1-14 Dialogue Breakdown Detection for Understanding Comics with Deep Learning
5	R1 group 1	R1-19 Hierarchical Attention Model for Acquiring Relationships Among Sentences
6	R1 group 2	R1-27 Thai Keyword Extraction using TextRank Algorithm
7	R1 group 2	R1-30 Thai ↔ English Translation Performance of Transformer Neural Machine Translation
8	R1 group 2	R1-34 PLATOOL: Annotation-tool for creating Thai plagiarism corpus
9	R1 group 2	R1-37 An Effect of Using Deep Learning in Thai-English Machine Translation Processes
10	R1 group 2	R1-40 Natural Language Processing
11	R1 group 3	R1-49 Creating Awareness of Incorrect English Pronunciation in Thai Elementary School Students using the Detect Me English,
12	R1 group 3	R1-52 Review Rating Prediction with Gaussian Process Classification
13	R1 group 3	R1-56 Parsing Thai Social Data: A New Challenge for Thai NLP
14	R1 group 3	R1-57 Using Noise Filtering and Ensemble Method for Sentiment Analysis on Thai Social Data
15	R1 group 3	R1-60 A Framework of Computer-Based Learning System Based on Self-Regulated Model in English Writing
16	R1 group 3	R1-63 Using Conceptual Graph to Represent Semantic Relation of Thai Facebook Posts in Marketing
17	R1 group 3	R1-72 Statistical Machine Translation between Kachin and Rawang
18	R1 group 3	R1-74 A Supportive Environment for Knowledge Construction based on Semantic Web Technology: A Case Study in a Cultural Domain

Track 2 : Robotics, IoT and Embedded System.

No.	Session	Paper ID: Paper Title
1	R2 group 1	R2-09 Sumo Based Dynamic Traffic Simulation for Intelligence Traffic Management System
2	R2 group 1	R2-10 R-Cane: A Mobility Aid for Visually Impaired
3	R2 group 1	R2-25 Design and Fabrication of an Affordable SCARA 4-DOF Robotic Manipulator for Pick and Place Objects
4	R2 group 1	R2-26 Design and Implementation of an Indigenous Solar Powered 4-DOF Robotic Manipulator Controlled Unmanned Ground Ve
5	R2 group 1	R2-46 Classification of Depressed Speech Samples using Spectral Energy Ratios as Depression Indicator
6	R2 group 1	R2-47 Characterizing Depressive Speech with MFCC

Track 3 : Data Analytics and Machine Learning.

No.	Session	Paper ID: Paper Title
1	R3 group 1	R3-07 Comparing Effectiveness of Six Text Classifiers for Predicting Stock Price Direction of SET
2	R3 group 1	R3-15 Deep Neural Network Pretrained by a Support Vector Machine
3	R3 group 1	R3-16 the novel index of the similarity between hand-drawn sketches for machine learning
4	R3 group 1	R3-17 Optical-based Limit Order Book Modelling using Deep Neural Networks
5	R3 group 1	R3-20 Predicting System for the Behavior of Consumer Buying Personal Car Decision by Using SMO
6	R3 group 2	R3-24 Parameterized Minutiae Analysis for Generating Secured Fingerprint Template
7	R3 group 2	R3-32 Query-by-Example Word Spotting with Fuzzy Word Sizes
8	R3 group 2	R3-36 TVis: A Light-weight Traffic Visualization System for DDoS Detection
9	R3 group 2	R3-41 Combining Extreme Multi-label Classification and Principal Label Space Transformation for Cold Start Thread Recommenc
10	R3 group 2	R3-42 Analysis of Detecting and Interpreting Warning Signs for Distance of Cars using Analyzing the License Plate
11	R3 group 3	R3-45 Predicting Chance of Success on Epiretinal Membrane Surgery using Deep Learning
12	R3 group 3	R3-51 Effective face verification systems based on histogram of oriented gradients and deep learning techniques
13	R3 group 3	R3-53 Predictive Analytics of Various Factors Influencing Gold Prices in Thailand using ARIMA Model on R
14	R3 group 3	R3-54 The development of an Alerting System for Spread of Brown Plant hoppers in paddy Using Unmanned Aerial Vehicle and Ir
15	R3 group 3	R3-55 Bandit Multiclass Linear Classification for the Group Linear Separable Case
16	R3 group 3	R3-58 A Classification Model for Thai Statement Sentiments by deep learning techniques
17	R4 group 3	R3-59 The analysis for quantitative evaluation of palpation skills in maternity nursing
18	R3 group 4	R3-61 Predicting Drug Sale Quantity using Machine Learning
19	R3 group 4	R3-62 Analyzing behavior in nursing training toward grasping trainee's situation remotely
20	R3 group 4	R3-73 Predicting business alliance factors that affect community enterprise performance
21	R3 group 4	R3-77 Gender Recognition from Facial Images using Local Gradient Feature Descriptors
22	R3 group 4	R3-78 Develop the Framework Conception for Hybrid Indoor Navigation for Monitoring inside Building using Quadcopter
23	R3 group 4	R3-80 Document Clustering for Oil and Gas News Articles

Track 4 : Signal, Image and Speech Processing.

No.	Session	Paper ID: Paper Title
1	R4 group 1	R4-05 Improving Voice Activity Detection by using Denoising-Based Techniques with Convolutional LSTM
2	R4 group 1	R4-11 RoadWay: Lane Detection for Autonomous Driving Vehicles via Deep Learning
3	R4 group 1	R4-12 A combined method for detecting seven segment digit detection on medical devices
4	R4 group 1	R4-38 Thai Vowels Speech Recognition using Convolutional Neural Networks
5	R4 group 1	R4-64 Object Distance Estimation with machine learning algorithms for Stereo Vision
6	R4 group 2	R4-65 Automatic Football Match Event Detection from the Scoreboard using a Single-Shot MultiBox Detector
7	R4 group 2	R4-66 A Light-Weight Deep Convolutional Neural Network for Speech Emotion Recognition using Mel-Spectrograms
8	R4 group 2	R4-68 Design and Implementation of A Smart Shopping Basket Based on IoT Technology
9	R4 group 2	R4-71 Adaptive e-Learning Recommendation Model Based on Multiple Intelligence
10	R4 group 2	R4-79 DDOS Attack Detection & Prevention in SDN using OpenFlow Statistics

Track 5 : Smart Industrial Technologies.

No.	Session	Paper ID: Paper Title
1	R5 group 1	R5-13 Synchronization Control for Microgrid Seamless Reconnection
2	R5 group 1	R5-21 An Efficiency Comparison for Predicting of Educational Achievement Based on LMT
3	R5 group 1	R5-22 Prediction Model for Amphetamine Behaviors Based on Bayes Network Classifier
4	R5 group 1	R5-23 The Development of a Model to Predict Marbling Score for fattening Kamphaeng Saen Beef Breed Using Data Mining
5	R5 group 1	R5-29 Intelligent Credit Service Risk Predicting System Based on Customer's Behavior By Using Machine Learning
6	R5 group 2	R5-31 Development of Fun Hint Game Applications for Special Children on Smart Devices
7	R5 group 2	R5-35 The Development of Intelligent Models for Health Classification
8	R5 group 2	R5-43 Automatic Envelope Sorting Using the Template Matching Technique
9	R5 group 2	R5-44 Smart Industrial Technologies Interactive LED Table
10	R5 group 2	R5-67 The Development of Eyes Tracking System in Smartphone for Disabled Arm Person
11	R5 group 2	R5-70 Short-circuit and Over Current Notification in Sub-transmission Line by Messege Cellular Network
12	R5 group 2	R5-76 Voltage Failure Warning Device for 3-Phase Transformer

iSAI-NLP 2019 Abstracts

(Sorted by Paper ID)

iSAI2019 : R1-01

The First Wikipedia Questions and Factoid Answers Corpus in the Thai Language

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Abstract: This article introduces a Thai questions-answers corpus for a question-answering task which was extracted from Thai Wikipedia which was downloaded on 17 December 2017. The answers comprise 5,000 annotated factoids. The corresponding questions are exact phrases/sentences that contain the answer, but are replaced by a question word, or synthetic questions acquired from phrases and/or sentences on the wiki page. A question must contain only one of a set of 7 specific question words and a complex question must be avoided. Fifteen annotators used an annotation system specifically designed for this task. Acceptance, rejection, and revision processes were monitored by a language specialist. The final set was divided into 4,000 pairs for a training set and 1,000 pairs for a validation set. A baseline evaluation was conducted and an F1 score of 27.25 was obtained from document readers and 71.24 from document retrievals.

Keywords: Thai questions-answers corpus, Thai QuestionAnswering system.

iSAI2019 : R1-04

Descriptive Feedback on Interns' Performance using a text mining approach

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Abstract: Descriptive feedback is a powerful tool to identify the strength and the areas that need improvement of a certain program. Text analysis using text mining approach is the most common application in the text processing field. This study aimed to determine the potentials and the imperfections of the IT interns while taking the internship program using text mining applications. Text dataset from the internship program of the IT curriculum under the College of Computer Studies and Information Technology of Southern Leyte State University was the input of the study. This study applied the text mining application using the Naïve Bayes text classification to determine the performance of the IT interns. Results show that the IT interns of the program were proficient technically but had a problem with their communication skills. The model has obtained an acceptable accuracy rating in predicting the performance of the students. Based on the results, the IT interns were efficient in the IT-related task. However, there is a need to improve interns' communication skills. The management should think for a possible bridging program that will help the student to develop their communication skills.

Keywords: Natural Language Processing, Naïve Bayes algorithms, text classification, interns' performance, predictive model.

iSAI2019 : R4-05

Improving Voice Activity Detection by using Denoising-Based Techniques with Convolutional LSTM

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Abstract: The performance of voice activity detection (VAD) is drastically degraded when observed speech signals are from unseen noisy environments. In this paper, we propose denoisingbased VAD to cope with the unseen noises. The proposed VAD system mainly consists of two stages for denoising and speech/non-speech classification. In the first stage, either logmagnitude spectral estimator (LSA) or convolutional long shortterm memory neural network autoencoder (CLAE) is applied to eliminate the noises. The convolutional bidirectional long-shortterm memory deep neural network (CBLDNN) is employed for the speech/non-speech classification. The results showed that the proposed VAD was better than the baseline. Furthermore, our CLAE tends to outperform the LSA in denoising algorithms when the signal-to-noise ratio is 5dB.

Keywords: Voice Activity Detection, Convolutional LSTM, DNN, Bidirectional LSTM, Convolutional Autoencoder.

iSAI2019 : R1-08

Semantic Enhancement and Multi-level Label Embedding for Chinese News Headline Classification

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Abstract: News headline classification is a specific example of short text classification, which aims to extract semantic information from the short text and classify it accurately. It can provide a fast classification method for data of various kinds of news media, thus arousing the common concern of academia and industry. Most short text classification methods are based on the semantic expansion of external knowledge, which is unable to expansion dynamically in real time and make full use of label information. To overcome these problems, we propose a novel method which consists of three parts: semantic enhancement, multi-dimensional feature fusion network and multi-level label embedding. Firstly, the word-level semantic information are embedded into the character encoding from pre-train model to enhance semantic features. Secondly, both of Bi-GRU and multi-scale CNN are used to extract sequence and local features of text to enhance the semantic representation of the sentence. Furthermore, the multi-level label embedding is used to filter textual vector and assist classification in the word and sentence level respectively. Experimental results on NLPCC 2017 Chinese news headline classification task show that our model achieves 84.74% of accuracy and 84.75% of F1, improves over the best baseline model by 1.5% and 1.6%, respectively, and reaches the state-of-the-art performance.

Keywords: News headlines classification, multi-level label embedding, semantic enhance, multi-dimensional feature fusion.

iSAI2019 : R2-10

R-Cane: A Mobility Aid for Visually Impaired

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Abstract: An Electronic Travel Aid (ETA) has become a necessity for visually impaired to provide them proper guidance and assistance in their daily routine. As the number of blind persons are gradually increasing, there is a dire need of an effective and low-cost solution for assisting them in their daily tasks. This paper presents a cane called R-Cane which is an ETA for the visually impaired and is capable of detecting obstacles in front direction using sonar sensor and alerts the user by informing whether the obstacle is within the range of one meter. In R-Cane, tensorflow object-detection API has been used for object recognition. It makes the user aware about the nature of objects by providing them voice-based output through bluetooth earphones. Raspberry Pi has been used for processing and Pi camera has been used to capture frames for object recognition. Further, we have implemented Single Shot Multibox Detector (SSD) based four models for object detection. The experimental analysis shows that out of the four models, average F1 score of all the classes is highest for SSD_Mobilenet_v1 _Ppn_Coco model model.

Keywords: Electronic Travel Aids, Sensor, Assistive Technology, Visually Impaired, Ultrasonic Sensor, Raspberry Pi.

iSAI2019 : R4-11

RoadWay: Lane Detection for Autonomous Driving Vehicles via Deep Learning

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Abstract: Locomotion is basic to all human needs. Modern-day transport has come a long way but still far away from perfection and allaround safety. Lane Detection is a concept of demarcating lanes on the roads while the vehicle is moving. Lane detection algorithm is used in the project of autonomous self-driving vehicles. It has the capability of changing the vehicular movements on road to a great extent making them more organized and safe. This leap could provide for driver carelessness and avoid a lot of mishaps on the roads. Ride-hailing services such as Uber and Ola companies can use them to monitor drivers and rate them based on driving skills. We have designed and trained a deep Convolutional Network model from scratch for lane detection since a CNN based model is known to work best for image classification datasets. We have used multiple metrics values for hyper-parameters and took the ones which gave the better results. The training part is done on Supercomputer NVIDIA DGX V100. A deep learning approach has been proposed to successfully identify the lane in highways on video data.

Keywords:-

iSAI2019 : R4-12

A combined method for detecting seven segment digit detection on medical devices

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Abstract: Biometric data is created by a diversity of medical devices. Manual recording of biometric data from medical devices can be a time-consuming task. Seven segment digit is normally presented on medical devices, for example, blood pressure monitors, glucose meters and digital weight scales, etc. Computer image processing is utilized to automatically analyze sevensegment digit from medical devices for collecting large data sets of biometric data. The objective of this work is to detect a seven-segment digit screen from medical devices. The purposed method begins with seven segment screen detection using a deep learning technique. Afterward, a variety of image processing techniques and parameters are applied to locate the seven-segment digit positions. Experimental results were reported with an accuracy (F-measure) of 94 % utilizing 200 seven-segment digit images.

Keywords: component; Seven-segment digits; medical device.

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iSAI2019 : R5-13

Synchronization Control for Microgrid Seamless Reconnection

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Abstract: In the three phase distribution network, the microgrid is connected the utility grid at the point of common coupling (PCC) and can operate either in a grid-connected or standalone modes. However, at the moment of transition mode from standalone to grid-connected mode if the microgrid is reconnected to the utility grid without synchronization, the outof-phase reclosing might be occur and lead to serious consequences e.g. large inrush current, overvoltage, system oscillations, and damage to system equipment itself. Thus, in order to achieve microgrid seamless reconnection, it is necessary to synchronize frequency, phase and amplitude voltage of the microgrid to the utility grid before reconnection. In this paper, a synchronization control has been proposed for microgrid seamless reconnection. The additional Distributed Generator (DG) is installed at PCC and assigned to be Dispatch Unit (DU). DU is controlled by Droop Control for generating the electric power to adjust frequency, phase and amplitude voltage of the microgrid at PCC during transfer to grid-connected mode. The proposed method is performed by eliminating the difference of frequency, phase and amplitude voltage during transition modes. The simulation has been performed in Matlab/Simulink.

Keywords: Droop Control, Distributed Generator (DG), Dispatch Unit (DU), SmoothTransition.

iSAI2019 : R1-14

Dialogue Breakdown Detection for Understanding Comics with Deep Learning

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Abstract: For research on computer understanding of comics, due to the copyright, we suffer from the number of data. Thus, we require a model which understands comic contents with less data. Unsupervised models can be trained on data without annotations. We compared two unsupervised approaches—bidirectional encoder representations from transformers (BERT) and Skip-Thought—on Japanese comics because BERT achieved state-of-the-art results on the many datasets and Skip-Thought was a models learning the continuity of text. After all, BERT outperformed Skip-Thought. However, the models did not solves problems with unique expressions which datasets for dialogue breakdown detection did not contain but comics datasets. We concluded that we needed more comics data or ordinary conversation data similar to talks in comics for computer understanding of comics.

Keywords: natural language processing, japanese comics, unsupervised learning, dialogue breakdown detection.

iSAI2019 : R3-15

Deep Neural Network Pretrained by a Support Vector Machine

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Abstract: Recently, deep neural networks (DNNs) have shown strong performance in many applications. Some models achieve state of the art in a wide range of fields, such as natural language processing and image processing. Support vector machines (SVMs) have also been a popular approach thanks to their performance. Their criterion selects effective variables in a dataset, and kernel methods help the models extract useful features for prediction. In this paper, we propose a unique method to apply parameters of a pretrained SVM to a DNN. Our proposed method initializes the first layer of a DNN to behave as the pretrained SVM or to extract powerful features from input variables. As a result, the DNN is successfully tuned during the training, because it inherits the advantages of SVMs. To show performance of our proposed method in the experiments, we apply it to classification of a toy dataset and to a sentiment analysis of movie reviews. The results show that the pretrained parameters have a significant effect on the optimization of DNNs.

Keywords: support vector machine, deep neural network, kernel method.

iSAI2019 : R3-16

The novel index of the similarity between hand-drawn sketches for machine learning

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Abstract: We have dealt with sketches hand-drawn by human hands. They are creations including human emotions and sensibility. To handle sketches on a computer, it is necessary to have an index that quantitatively evaluates the stroke-order. We have already proposed a sketch similarity index for pen movement by cosine similarity. However, we also found that human cognition strongly depends on the shape of a sketch when they understand what is drawn. For this reason, we propose a new similarity index, which is the old index added to a shape similarity index. As a result, the similarity index composed of cosine similarity and Structural Similarity (SSIM) has a strong positive correlation with the human evaluation of similarity. Then, the correlation coefficient is 0.5667. Therefore, we define an objective evaluation model for the stroke-order similarity that incorporates not only the pen movement of a sketch but also the shape of one, and we verify its effectiveness by our experiments.

Keywords: sketch-rnn, similarity, stroke-order, Kansei.

iSAI2019 : R3-17

Optical-based Limit Order Book Modelling using Deep Neural Networks

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Abstract: We used a deep neural network to model an order book's behavior in a stock market using its snapshots as an input. The snapshots were taken from a stock market application in time series format. Google's Tesseract OCR was used to extract price data from these snapshots. A long short-term memory (LSTM) neural network was used to learn the price behaviors in order to predict its future trends, i.e. up, down, or neutral. The result showed that the system achieved an accuracy of 58.98% despite the noise from the OCR and the sampling effect of the snapshots.

Keywords: Predictive models, Time series analysis, Deep Neural networks, Stock markets.

iSAI2019 : R1-19

Hierarchical Attention Model for Acquiring Relationships Among Sentences

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Abstract: In this paper, we propose a hierarchical attention model for summarization. Normally, sentences have relations among another sentence and it is important to consider these relations in summarizing. Our proposed model can make each sentence vectors from document composed of multi sentences and get relations among sentences from these vectors by the incorporated operation. As an operation of taking relations, we use self-attention and gated convolutional neural network. It has been reported that these operations can get dependencies among words, and self-attention is particularly powerful. Therefore we adopted these operations expecting the same work in sentences. We conducted an experiment of title generation by using Japanese news articles. We evaluated the performance of our proposed model by Rouge and visualized the relations among sentences.

Keywords: nueral network, attention mechanism, generative summarization.

iSAI2019 : R3-20

Predicting System for the Behavior of Consumer Buying Personal Car Decision by Using SMO

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Abstract: Current consumer behavior traders are used to create decision-making tools for entrepreneurs to produce products or services that meet consumer needs. For this reason, therefore focusing on data analysis using SMO techniques for predict system for the behavior of consumer buying personal car decision based on a total of 1,110 data obtained, with a total of 6 relevant car trading information features, consisting of income customers, type of car, down payment/cash booking, decision results requires that the answer in the forecast is divided into two classes, namely the class of buying cars and not buying cars When dividing the data into 50% training set and using 50% test set, 555 training set will be used and 555 test sets can be used to enter the learning and testing process. By random 50/50 in the selection of algorithms to be tested and the accuracy of 95.13%.

Keywords: predicting, behavior, consumer, personal-car decision, SMO.

iSAI2019 : R5-21

An Efficiency Comparison for Predicting of Educational Achievement Based on LMT

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Abstract: This paper focuses on efficiency comparison for predicting of educational achievement by using the decision tree technique. The data are used in this work from graduation of Muban Chombueng Rajabhat University (MCRU) during the academic year A.D. 2013 - A.D. 2016. The data set consist of 2,437 records with 15 attributes such as debut consisting of gender, race, nationality, religion, number of siblings, number of siblings who have studied, career, father, occupation, mother, income, father, income, mother, status, father, mother, district, semester, graduation and educational achievement. The class separated into two classes which is ―complete‖ and ―incomplete‖. The group of decision tree used for comparing. In our experimental, the data are divided into 50/50 % for training and testing set by random. The accuracy rate of LMT is the highest that showed 100%.

Keywords: Data mining, Predictions, Decision trees, LMT.

iSAI2019 : R5-22

Prediction Model for Amphetamine Behaviors Based on Bayes Network Classifier

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Abstract: This paper focus to present a prediction model for drug addiction of the accused in type 1 drug abuse case as amphetamine. Case studies in the Suan Phueng Police Station area Ratchaburi province. The data set that used for modeling is obtained from the collection from Suan Phueng Police Station from 2016 - 2018. The data set 1,598 items consist of gender, age, number of offenses, education status, nationality, occupation, and non-drug abuse. For our contribute a prediction model into two classes as ―take‖ and ―untake‖ by using data mining techniques namely Bayes Network classifier. In our experimental, a group of bayes are used to comparison such as Bayes Network, Naive Bayes and Naive Bayes Updateable. The results displayed the Bayes Network classifier shown the highest accuracy rate, Naive Bayes and Naive Bayes Updateable with 8 1 .5 3, 80.85 and 80.85 respectively.

Keywords: Prediction model, Amphetamine, Behaviors, Bayes Network Classifier.

iSAI2019 : R5-23

The Development of a Model to Predict Marbling Score for fattening Kamphaeng Saen Beef Breed Using Data Mining

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Abstract: The purpose of this research was to create a model for beef marbling score in Kamphaeng Saen beef breed using data mining techniques. The data of the fattening cattle were transformed from Kamphaeng Saen Beef Co-operative Co., Ltd. during 2015-2019. For 5 years, 1 ,5 6 8 head, including the fattening period (month), the age of the cattle from the shedding and wear of the teeth The weight is alive when slaughter, the carcass weight into a fresh, carcass weight, cool carcass percentage and the marbling score in the meat. To create a forecast model by using data classification techniques with Decision Tree method with C4 . 5 algorithm, then test the predictive model with percentage split method by dividing the data into training set 3 0 % and test set 7 0% . It is found that the accuracy is 5 7.1 9 4 9 % both because there are many factors related to the formation of fat in the muscles such as varieties, age, sex and feed, especially feed is the main factor affecting the accumulation of fat in the muscles. The growth of fat that is controlled by Stearoyl-CoA desaturase (SCD) shows that the prediction of the marbling score in fattening cow muscle with data mining techniques can be used as a means of forecasting without having to wait. The cattle were finished and assessed from the remains of the cattle.

Keywords: Predict, Marbling Score, Kamphaeng Saen Beef Breed, Data Mining.

iSAI2019 : R3-24

Parameterized Minutiae Analysis for Generating Secured Fingerprint Template

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Abstract: This paper presents a parameterized minutiabased approach for generating secured templates from fingerprint images. The research has a great contribution in the field of security of the fingerprint template database. The fingerprint minutia features and their related parameters have been analyzed and hence, proposed a method that can hide fingerprint features by adding chaffs or fake minutiae and changing real minutia information to generate secured templates or vaults. The proposed method achieved highest accuracy for verification and has diversity that creates dissimilar vaults to resist correlation attacks.

Keywords: Biometric features, correlation attacks, fingerprint minutiae, fuzzy vaults, secured template.

iSAI2019 : R2-25

Design and Fabrication of an Affordable SCARA 4-DOF Robotic Manipulator for Pick and Place Objects

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Abstract: Automation of industrial sector is growing rapidly due to deployment of precision robots. In this article, we present a low cost local manufactured 4 degree of freedom (DOF) pick and place robotic manipulator can be used for industrial assembly line applications such as textile, automobile and agriculture sectors. The main concerns persist in most of these robotic manipulators are precision and control. To emphasis on this we used Selective Compliance Assembly Robot Arm (SCARA) to automate pick and place tasks. Our designed robotic arm can carry maximum payload of 2 kg with an arm length of 300mm. We also discuss in detail the manufacturing process and testing results of our developed SCARA robotic manipulator.

Keywords: SCARA, 4-DOF Grasping Manipulator, Pick and Place.

iSAI2019 : R2-26

Design and Implementation of an Indigenous Solar Powered 4-DOF Robotic Manipulator Controlled Unmanned Ground Vehicle

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Abstract: We have presented in this paper the design, control and implementation of a versatile low cost manipulator with arm gripper configured on an existing unmanned ground vehicle (UGV) for lifting payload (PL) and performing real world tasks. The major development in this work is the robust and efficient stable design of manipulator having four degrees of freedom (DOF) capable of lifting up to 1.5 kg weight for various industrial and non-industrial applications. The communication link is established using two human supervisory controlled wireless four channel 2.4GHz remote controllers, which are separately used for UGV and manipulator for effective maneuvering and control of a 6-DOF overall. The controlling of RC servo motors is made using Arduino Uno controller board. An on board solar panel is used for charging batteries run time during the day. A 50W, 18V standard solar panel is used to enhance the maneuvering time of UGV and manipulator. The unique feature of our UGV is its two rotating head on flippers capable of controlled maneuvering especially in uneven terrain surfaces, stair climbing etc. It can also perform difficult tasks in human unapproachable situations like contaminated or hazardous areas in several industrial and medical applications.

Keywords: 4-DOF Grasping Manipulator, UGV, Wireless Controlled, Solar Powered.

iSAI2019 : R1-27

Thai Keyword Extraction using TextRank Algorithm

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Abstract: Information Extraction (IE) refers to the automatic extraction of structured information such as entities, relationships between entities, and attributes describing entities from unstructured sources. Keyword Extraction is the part of information extraction to discovering implicit and potentially important keywords in underlying unstructured natural-language texts. Due to the inherent chracteristic of Thai written language which does not explicitly use any word delimiting characters, identifying individual words. In this paper, an alternative method to word formation for noun phrase recognition is proposed. The word formation is improving keyword extraction using the compound noun pattern. We use the word formation to applying the TextRank algorithm to grouping the noun phrase, thire is selected as candidate to calculate in algorithm. The experiments are 2,727 documents in banking domain from social online such as Facebook, Twitter, online news. The experimental results yield 30.73% of accuracy with significant improvement by word formation.

Keywords: TextRank algorithm, keyword extraction, information extraction, noun phrase recognition, word formation, compound noun pattern.

iSAI2019 : R5-29

Intelligent Credit Service Risk Predicting System Based on Customer's Behavior By Using Machine Learning

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Abstract: This paper present a model for predicting the behavior of customers in an intelligent manner in the form of customer credit risk for use in decision making for executives in business organizations by applying pmanagement's decision to credit corporate customers by machine learning techniques. Machine learning techniques, which is an important technique that is the heart of artificial intelligence (Ai). Decision Tree model that is analyzed for credit business customers in business organizations which consists of six attributes, the number customers of 1,100 records. The risk is classified into three class, namely, low, medium and high. Our model analysis can be done with accuracy of 85.82% of the customer genius in the form of risk to credit customers of the trading organization has been developed to support the decision making of executives more quickly and more effectively.

Keywords: intelligent, credit service, behavior, forecast, risk.

iSAI2019 : R1-30

Thai-English and English-Thai Translation Performance of Transformer Machine Translation

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Abstract: In this paper, the machine translation models were applied to the Thai-English and English-Thai machine translation task. We investigated three models of machine translation on Thai and English sentence pairs. The translation performance of the transformer model is better than that of the recurrent neural network and the traditional statistical machine translation models. We found that the BLEU scores of the transformer model were the highest in both Thai-English (44.22%) and English-Thai (46.48%) translations. Besides, the results were also analysed linguistically. In comparison with the three models, the errors about detailed description and wrong word ordering were mostly found in the SMT model, whereas wrong word choice and missing words were mostly found in the RNNs model. Although the transformer model could perform much better than others, three error categories – undertranslation, over-translation, and incorrect lexical choice – were also found.

Keywords: Transformer Machine Translation, Recurrent Neural Machine Translation, Statistical Machine Translation, Thai-English Machine Translation, English-Thai Machine Translation.

iSAI2019 : R5-31

Development of Fun Hint Game Applications for Special Children on Smart Devices

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Abstract: This paper illustrates the use of Fun Hint Game applications for special children on smart devices. The sample of this experiment were 13 special children from Child Welfare Place with Brain Disabilities Ratchaburi Province, Thailand. The propose of the research were to 1) to design and develop Fun Hint Game application for special children 2) to find the performance of Fun Hint Game applications for special children 3) to compare achievement of students after learning through Fun Hint Game applications for special children on Smart Devices 4) study the level of satisfaction of students towards the Fun Hint Game applications for special children. The results of the research were 1) applications for the special children game on mobile devices were effective for use 2) achievement of students after learning through Fun Hint Game applications for special children higher than before, with statistical significance at the level of .05 3) the students' satisfaction with the fun hint game for special children on mobile devices was at the highest level ($\bar{x}$ = 4.54, S.D. = 0.67).

Keywords: special child, smart device, applications.

iSAI2019 : R3-32

Query-by-Example Word Spotting with Fuzzy Word Sizes

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Abstract: This paper proposed the query-by-example word spotting model for handwritten documents with image fuzzification. Fuzzy size of word images was used to size of problem. The number of classes in each set were decreased, which made it is easy to choose parameters. The Pyramid of Histogram of Oriented Gradients (PHOG) feature and Support Vector Machine (SVM) were employed to use in the model. IAM handwritten database was used for evaluating the model. The result demonstrates that the micro precision of model with image fuzzification and without image fuzzification were 35.11% and 23.54% respectively. However, the accuracies of the models were 35.11% and 40.14% respectively. Thus, the image fuzzification can be used for reducing of type one error with slightly accuracy loss.

Keywords: word spotting, query-by-example, fuzzy logic, image fuzzification, support vector machine, handwritten recognition, pyramid of histogram of oriented gradients.

iSAI2019 : R1-34

PLATOOL: Annotation-tool for creating Thai plagiarism corpus

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Abstract: In 2018, we created TPLAC-2018, a Thai plagiarism corpus, which was manually developed by seven human annotators. The annotators were told to simulate a plagiarized text by using four plagiarism cases, namely, copying and pasting, inserting, replacing and removing. This paper presents PLATOOL, an annotation-tool on a web-based platform, which helps all annotators to easily annotate plagiarism cases in 1052 suspicious documents chosen from 100,000 source documents on Thai Wikipedia website. The tool contains two components i.e., a web interface and a database. The first component is to interact between a user and PLATOOL web server. The second is designed to store, manage, facilitate access to plagiarism corpus. The result of annotation and discussion was concluded in the last section of the paper.

Keywords: PLATOOL, annotation-tool, Thai plagiarism corpus.

iSAI2019 : R5-35

The Development of Intelligent Models for Health Classification

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Abstract: This paper focuses on development intelligent health classification models for individuals with C4.5 techniques, which collected physical fitness data of those who exercise in Ratchaburi province. A total of dataset were used for creating models 376 records, and 19 attributes of personal information consists of age, sex, weight, height, pulse, upper blood, lower blood, weight bike, hand womenorce, leg stretch, triceps, biceps, suprailiac, subscapular, leg, grip, womenlex, lung capacity, O2 and two classes. The classification is divided into five classes, including the best health, good, normal, low and very low. In our experiment, the researcher divided the data set into two groups: training and testing and designed the test using 10-fold crossvalidation method. The accuracy rate of C4.5 shown 100%.

Keywords: Development, Intelligent Models, Health, Classification.

iSAI2019 : R3-36

TVis: A Light-weight Traffic Visualization System for DDoS Detection

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Abstract: With the rapid growth of network size and complexity, network defenders are facing more challenges for protecting their networked computers and other devices from intelligent attacks. Traffic visualization is an important element in the anomaly detection system for visual observations and detection of distributed DoS attacks. This paper presents a visual interactive system called TVis which is proposed to detect DDoS attacks using Heron's triangle-area map estimation. TVis allows network defenders to detect and investigate anomalies in internal and external network traffic at both online and offline mode. We model the network traffic as an undirected graph and compute triangle-area map based on incidences in each vertex for each time period 5 seconds. The system triggers an alarm iff the system found the area beyond the dynamic threshold. TVis performs well in comparison to its competitors.

Keywords: DDoS attack; visualization; network traffic; online and offline; triangle-area.

iSAI2019 : R1-37

An Effect of Using Deep Learning in Thai-English Machine Translation Processes

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Abstract: Deep learning has been used in many fields including natural language processing. This paper aims to study the effect of applying deep learning in machine translation processes including word segmentation and translation model generation. We compare the results of the process from traditional statistical method and deep learning and analyze the difference. From experiment, the results indicated that the processes from deep learning obtained higher score in overall. Word segmentation from Bidirectional neural network yielded 0.861 f1 score which was higher than standard n-gram based system for 0.081. The translation results within dataset show that the neural-network-based translation got the best BLEU score in average for 0.43 in which are higher than the traditional statistical approach for 0.16.

Keywords: Deep Learning, Neural Machine Translation Thai-English translation.

iSAI2019 : R4-38

Thai Vowels Speech Recognition using Convolutional Neural Networks

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Abstract: The vowel is considered as the core of syllable in each word. This paper aims to present noisy Thai vowels speech recognition by using Convolutional Neural Network (CNN). The noisy Thai vowels dataset is the speech of Thai vowels in real-world situations. The sound is collected in a real environment from several areas which consist of many types of noise at 30 - 40 dB SNR (Signal to Noise Ratio). It constrains 16 kHz speech data is recorded from a mobile phone. The vowel speeches are separated into 2 groups: male's voice and female's voice from 25 male and 25 female speakers. In this research, it constrains 18 classes (9 short vowels and 9 long vowels). Mel Frequency Cepstral Coefficients (MFCCs) are used for feature extraction. The most accuracy rate of the CNN_Thai Simple Vowel (CNN_TSV) model is 90.00% and 88.89% on female and male voices respectively. The comparison results of CNN_TSV model with other models such as Multilayer Perceptron (MLP) and Support Vector Machines (SVM) show that the CNN_TSV model is the most effective for both female and male voices. This research can be used as one of an alternative model to apply for Computer-assisted language learning (CALL) in the future development direction.

Keywords: Convolutional Neural Networks, CNNs, Vowels, Thai vowels, Classification, Speech Recognition.

iSAI2019 : R1-40

Unsupervised Multilingual Ontology Learning

Brijesh Bhatt

Abstract: Multilinguality poses a big challenge to the growth of semantic web. In order to develop multilingual applications we need to develop ontologies which can be shared across languages. In this paper we propose an unsupervised learning algorithm to automatically learn multilingual ontology from unstructured text. We propose three different approaches for multilingual ontology learning, Dictionary based method,parallel corpus based method and Latent Dirichlet Allocation (LDA) based method. While the first two approaches require availability of dictionary and parallel corpus, the LDA based approach does not require any special resource. We have conducted our experiments for two languages, English and Hindi, however the proposed method is general enough to be adopted for other languages also.

Keywords: Ontology learning, Expectation-Maximization, multilingual ontology, unsupervised learning.

iSAI2019 : R3-41

Combining Extreme Multi-label Classification and Principal Label Space Transformation for Cold Start Thread Recommendation

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Abstract: The recommendation system has been widely used in various areas, e.g., entertainment, education, and travel. However, this technique faces two main challenges which are Cold Start and High-Dimensionality problems. The cold start happens when the system does not have enough profile of new users; therefore, the system cannot recommend products to them. The second issue comes from the fact that there are a lot of distinct products or users to be recommended. Recently, Extreme Multi-label Classification (XMLC) has been applied to the recommendation system and addressed the Cold Start issue. However, the previous method still has a high-dimensionality issue. In this paper, we proposed a new approach, namely XMLC-PAO, which integrated label space reduction with XMLC. In more details, we transformed the recommendation problem to XMLC and applied Singular Value Decomposition (SVD) to generate reducing operator of label space (products' or users' label space). For the feature space, Deep Learning technique has been used to extract features from texts. From the experiments with Stackoverflow online forums dataset, we have found that the XMLC-PAO showed better performance in terms of RECALL@M and NDCG@M when the dimensions were reduced to 50% and 80% of the original size.

Keywords: extreme multi-label classification, recommendation system, cold start problem, singular value decomposition – SVD.

iSAI2019 : R3-42

Analysis of Detecting and Interpreting Warning Signs for Distance of Cars using Analyzing the License Plate

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Abstract: The purpose of this research was to The Develop a System for Detecting and Interpreting Warning Signs, The researcher has proposed to develop a system for detecting and interpreting warning signs by using the theory of color from the sign of the traffic sign. This can be used in analyze and detect traffic signs through the design of applications on smartphones in order to be able to create the traffic sign support system by detecting and interpreting traffic signs. In this case, the driver can clearly and correctly understand the meaning of traffic signs. As a result, the driver can follow the traffic rules. Moreover, it helps reducing accidents on the road as well. The efficiency of the system was tested with test result, it is found that the program was able to detect traffic signs and interpret the objects within the image as traffic signs accurately. Additionally, it is found that the light and distance of the camera affected the quality of data processing in this test to measure performance. In addition, the accuracy of the system is totally 93.5.

Keywords: Warning Signs; Traffic sign; Detection.

iSAI2019 : R5-44

Smart Industrial Technologies Interactive LED Table

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Abstract: This the purpose of this research is to design, create, interact and evaluate the performance of Interactive LED table. This table can display the temperature of glass of drink and mix the colors of the light that represent the temperature on both sides of the table where the objects were placed to enhance the enjoyment, colorful, relax for user. In addition, it can show the status of the glass on the table with cold light tones or warm light tones. Evaluation of this project was separated for 3 experiments (25 times per set). First place a glass of drink with kind of different temperatures on LED light drinks holder beside the table and observe the results. Second place object on the interactive LED table then observe the results. Third place a glass of drink with kind of different temperatures on LED light drinks holder beside the table and place object on the interactive LED table at the same moment after that observe the results which were correlate in evaluation performance. We found that the first experiment succeeds 100%, the second experiment succeed 80% and the third experiment succeed 91.05%. In conclusion, the interactive LED table was successful pass all criteria.

Keywords: interactive LED table, performance, cold tone, warm tone.

iSAI2019 : R3-45

Predicting Chance of Success on Epiretinal Membrane Surgery using Deep Learning

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Abstract: A preliminary study on predicting chance of success on an epiretinal membrane surgery is studied. Given an optical coherence tomography image, the study shows that the multilayer perceptron neural network can achieve 91.0% accuracy. Due to an unbalance of the images of success and failure classes, under-sampling and over-sampling are applied. For oversampling, the images in the failure class are duplicated to balance the number of images compared to the success class. Utilizing the balance dataset, the prediction performance is improved from 91.0% to 93.0% for over- sampling. With the exploitation of, the salient region for training the model and predicting the outcome. The salient region is manually segmented to express the fovea in the OCT. The experimental results evidence an improvement of 1.0% with achievement of 94.0% accuracy.

Keywords: Epiretinal Membrane, Machine learning, retinal OCT image.

iSAI2019 : R2-46

Classification of Depressed Speech Samples with Spectral Energy Ratios as Depression Indicator

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Abstract: This research study aimed to investigate the characteristics of the Spectral Energy Ratios (SER) determined from the Power Spectral Density (PSD) of the spoken speech samples used to represent the severity level of emotional illness such as Depression in quantitative measure. Situation could be getting worst for a person who suffers from such illness with the elevated severity of symptom. When the symptom of severe depression strikes, a depressive person might be at high risk of committing suicide. The prevention of suicide is necessary for depressed persons to save life by admitting them in time and providing the proper treatment under supervision of clinical specialist. Prediction is primarily one of the most important tasks in the prevention of life-threatening risk from suicide. Researcher has attempted to adapt the speech processing techniques into a clinical diagnosis of emotional illness. In this study a full-band energy and further several sub-band energies estimated from the four frequency bands with each 625-Hz bandwidth were computationally extracted from the categorized speech samples and consequently formed the parameter models for classifications. As result shown, the averaged value of correct classification was obtained to be effectively approximate 80%, when training and validating classifiers with 35% and 65% of the extracted SER features, respectively.

Keywords: speech, depression, spectral energy ratios, classification.

iSAI2019 : R2-47

Characterizing Depressive Related Speech with MFCC

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Abstract: The experimental results from comparative study of acoustical properties in speech as emotional indicator based on spectral characteristics of speech signal have formerly been studied and reported for its quantitative information in association with the emotional states in persons suffering depression. This symptom affects speech production system of speaker, which modulates in spoken sound. MFCC has been reported for its characteristic change corresponding to severity of depression. The sixteenth MFCCs from remitted, depressed and suicidal patient groups were extracted, statistically tested and classified in pairwise fashion by using ML, LS and LMS classifiers. The best score of classification can be obtained at 0.2487 in error based on ML classifier with 80% of MFCC samples in testing phase. Results suggest the dominant property of MFCC in separation between suicidal and recovering speakers from depression.

Keywords: speech, MFCC, depression, maximum likelihood.

iSAI2019 : R1-49

Creating Awareness of Incorrect English Pronunciation in Thai Elementary School Students using the Detect Me English, Natural Language Processing, Application

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Abstract: This paper examines the ability of the Detect Me English application to create awareness of incorrect pronunciations in Thai Elementary Students (identified through Natural Language Processing). Phonetic analysis is a branch of NLP which analyses the sounds of human speech. The English correction software developed for this research uses an android system combined with the Detect Me English application to analyze the phonological sounds produced by the students. The researchers tested 60 students in total from grades 4-6. The results showed that the sample groups were not aware of many of the English phonological rules. Upon further analysis of the data recorded the post-test reveled that students were able to obtain significantly higher results.

Keywords: English pronunciation; English pronunciation awareness; English correction natural language processing software; Phonetics learning.

iSAI2019 : R3-51

Effective Face Verification Systems Based on the Histogram of Oriented Gradients and Deep Learning Techniques

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Abstract: In this paper, we proposed a face verification method. We experiment with a histogram of oriented gradients description combined with the linear support vector machine (HOG+SVM) as for the face detection. Subsequently, we applied a deep learning method called ResNet-50 architecture in face verification. We evaluate the performance of the face verification system on three well-known face datasets (BioID, FERET, and ColorFERET). The experimental results are divided into two parts; face detection and face verification. First, the result shows that the HOG+SVM performs very well on the face detection part and without errors being detected. Second, The ResNet-50 and FaceNet architectures perform best and obtain 100% accuracy on the BioID and FERET dataset. They also, achieved very high accuracy on ColorFERET dataset.

Keywords: face verification systems, face detection, face verification, ResNet-50, FaceNet.

iSAI2019 : R1-52

Review Rating Prediction with Gaussian Process Classification

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Abstract: Many researchers pay attention to training a nonlinear function according to training data because machine learning can represent more flexible function. One of approaches is extend a linear function to a nonlinear function with a kernel method. A typical method is Support Vector Machine (SVM), which is a discriminative model. In SVM, a kernel function is defined previously and you need much knowledge on tasks to choose a good kernel function. Hence, the kernel function selection affect the final performance of SVM are many kernel functions are developed according to each task. Another approach is Gaussian process, which is a generative model. Gaussian process estimate describes a distribution over functions and directly search the optimal function in function space. In SVM, a cost function is defined previously and the optimal parameters are searched with respect to training data. Gaussian process and SVM can construct a nonlinear function but their approaches are different. How are Gaussian process and SVM different in practice? In this paper, we evaluate Gaussian process and SVM with respect to review rating prediction, which is one of natural language tasks. Sentiment analysis research denotes some words contribute to sentiment polarity of a sentence strongly. However, deep learning improves the sentiment analysis adding nonlinear feature construction and it is clear that we have to deal with nonlinearity in sentiment analysis. Moreover, review rating prediction is one of multiclass classifications and the prediction needs more flexibility. Finally, when a review is transformed into a numerical vector with a Bag-of-Words model, the review vector has a very high dimension. Hence, the task have to avoid curse of dimensionality. Kernel trick is a main solution in SVM and a flexible regression function is additional solution in Gaussian process regression.

Keywords: Gaussian process, Gaussian process classification, review rating prediction, natural language processing.

iSAI2019 : R3-53

Predictive Analytics of Various Factors Influencing Gold Prices in Thailand using ARIMA Model on R

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Abstract: Predictive analytics of numerous factors influencing gold prices in Thailand is a significant topic to study because gold is a precious metal that can grow the world economy. The purpose of this study is to predict gold prices in Thailand based on various factors by means of Autoregressive Integrated Moving Average (ARIMA) models in R programming language. The influencing factors to predict the gold prices are; spot gold, consumer price index, exchange rate, gold prices in Thailand, inflation rate, stock exchange of Thailand index, interest rate and crude oil price. This study uses monthly data are retrieved from several sources; world gold council, bank of Thailand, gold traders' association and U.S. energy information administration during 2009 to 2018. The experimental results through comparing different ARIMAL models provided the most accuracy that returned the validated value via RMS, MAPE, and U as 0.66, 9.12, and 0.1 respectively.

Keywords: predictive analytics, gold price, ARIMA, R language.

iSAI2019 : R3-54

The Development of an Alerting System for Spread of Brown planthoppers in Paddy Fields Using Unmanned Aerial Vehicle and Image Processing Technique

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Abstract: This research aimed to analyze and design an alerting system for spread of Brown planthoppers in paddy using unmanned aerial vehicle and image processing technique. The research included reviewing and collecting data, designing unmanned aerial vehicle control system, testing flying system, designing color detection and comparing efficiency. To design color detection, image processing technique was employed. The research procedures consisted of receiving data, using 10 fps of an image of 640 x 480 pixel in a form of RGB and converting an image to HSV to adjust color values. The image was delivered to an inspection of images detected using Threshold. It could be summarized that the system could detect rice pests. Of the 50 tests, it was found that the difference of brown color was at 1.40%, of white color was at 0.73 % and of yellow color was at 0.00% in the paddy fields with rice pests. In addition, the error of brown color was at 0.01%, of white color was at 0.05% and of yellow color was at 0.00% in the paddy fields without rice pests.

Keywords: Spread of Brown planthoppers, Unmanned Aerial Vehicle, Image Processing Technique.

iSAI2019 : R3-55

Bandit Multiclass Linear Classification for the Group Linear Separable Case

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Abstract: We consider the online multiclass linear classification under the bandit feedback setting. Beygelzimer, Pal, Szorenyi, Thiruvenkatachari, Wei, and Zhang [ICML'19] considered two notions of linear separability, weak and strong linear separability. When examples are strongly linearly separable with margin γ, they presented an algorithm based on MULTICLASS PERCEPTRON with mistake bound O(K/γ2), where K is the number of classes. They employed rational kernel to deal with examples under the weakly linearly separable condition, and obtained the mistake bound of min(K · 2 O˜(K log2(1/γ)), K · 2 O˜(√ 1/γ log K)). In this paper, we refine the notion of weak linear separability to support the notion of class grouping, called group weak linear separable condition. This situation may arise from the fact that class structures contain inherent grouping. We show that under this condition, we can also use the rational kernel and obtain the mistake bound of K · 2 O˜(√ 1/γ log L)), where L ≤ K represents the number of groups.

Keywords: multiclass, bandit, linear separable, kernel, group linear separable.

iSAI2019 : R1-56

Parsing Thai Social Data: A New Challenge for Thai NLP

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Abstract: Dependency parsing (DP) is a task that analyzes text for syntactic structure and relationship between words. DP is widely used to improve natural language processing (NLP) applications in many languages such as English. Previous works on DP are generally applicable to formally written languages. However, they do not apply to informal languages such as the ones used in social networks. Therefore, DP has to be researched and explored with such social network data. In this paper, we explore and identify a DP model that is suitable for Thai social network data. After that, we will identify the appropriate linguistic unit as an input. The result showed that, the transition based model called, improve Elkared dependency parser outperform the others at UAS of 81.42%.

Keywords: natural language processing, dependency parsing, social data.

iSAI2019 : R1-57

Using Label Noise Filtering and Ensemble Method for Sentiment Analysis on Thai Social Data

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Abstract: Sentiment analysis is an essential task for social listening, especially in service and product analysis. Prior works on sentiment analysis, especially in Thai language, mostly focus on the improvement of model architecture without considering error propagation from word tokenizers or noisy text from social media. In this paper, three contributions are proposed for implementing social analysis model. First, text pre-processing is used to mitigate noise from input texts. Second, robustness towards word segmentation is enhanced by using an ensemble process with two tokenizers. Lastly, the training process inspired by Co-training method is proposed in order to filter label noise within the data. In the experiments, the model achieves 2.56% improvement on the average macro f-1 score when compared with the baseline models in social media data.

Keywords: Sentiment analysis, Text classification, Text preprocessing, Word segmentation, Noise-cancelling algorithm.

iSAI2019 : R3-58

A Classification Model for Thai Statement Sentiments by deep learning techniques

Pakawan Pugsee and Nitikorn Ongsirimongkol

Abstract: At present, many organizations realized the importance of sentiment analysis for consumer reviews. The positive and negative comments can help to evaluate the user satisfaction of products and services to control and improve their qualities. In addition, the deep learning techniques are very interesting methods for current researches in the data mining field. Therefore, this research studied on the deep learning techniques to analyzed user reviews and comments from the TripAdvisor website. To begin with, Thai user comments in four categories: hotels, restaurants, tourist attractions, and airlines were collected and tested on the combination of two basic deep learning technique that are convolutional neural network and long-short term memory. All user comments were divided into individual statements to classify into three groups: positive feelings, negative feelings, non-expressed feelings or neutrality. The research results found that the best classification model is the combination of three convolutional neural networks with 32, 64, and 128 filters, respectively, and the kernel size of 2 equal to the three components. Moreover, the performance of the proposed classification model was evaluated by the accuracy and the precision values were higher than 80% in all groups.

Keywords: sentiment analysis, sentiment classification model, convolutional neural network.

iSAI2019 : R3-59

The analysis for quantitative evaluation of palpation skills in maternity nursing

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Abstract: In recent nursing education, it is said that there is a big gap between the practical ability of novice nurses and the level required in clinical site, and it is required to enhance the practical experience of nursing students and improve the educational effect. This research focuses Leopold Maneuvers and clarify whether the palpation according to the textbook or not. The palpation according to textbook tends to examine with less pressure and slowly touching tather than applying excessive pressure. So quantitative evaluation of touch pressure can improve effective education of future nurses.

Keywords: Maternity nursing education, Palpation training, Qualitative evaluate support, Pressure data analysis.

iSAI2019 : R1-60

A Framework of Computer-Based Learning System Based on Self-Regulated Model in English Writing

Kanyalag Phodong, Thepchai Supnithi and Rachada Kongkachandra

Abstract: This paper presents a design phase of a computerbased learning system for English writing in Thai EFL learners. This system is designed to incorporate the self-regulated model and set the components of linguistics and machine translation as a learning environment. The system is designed based on three main phases of self-regulated model: forethought phase, performance phase, and self-reflection phase. The learning environment used to guide completely target sentence writing. Moreover, the display of user interface is designed for using as assisting tool for supporting a student self-regulated learning in English writing. There are three main modules of the system that consist of learning profile acquisition, learning behavior collection, and learning analytics. The system design is an important phase to encourages action between learners and computer-based learning system for English writing. Then, learners behavior are collected into data logs store for learning analysis. This system aims to collect Thai EFL learners behavior and find the behavioral pattern that could helpful reference for improve system and teaching materials in the future.

Keywords: computer-based learning system, self-regulated, machine translation, English writing.

iSAI2019 : R3-61

Predicting Drug Sale Quantity Using Machine Learning

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Abstract: Medication is one of the essential parts of a patient's treatment. Therefore, it is important to have good medication storage administration in order to have effective medication storage. This study aimed to find a proper model used for the prediction of medication purchase amount by using machine learning to analyze medication purchasing amounts in the form of time series. In this research, the first 10 medicines in AV group were chosen. Then, Multilayer Perceptron (MLP), Long ShotTerm Memory (LSTM), and 1D Convolutional neural network with LSTM models were used together with Rolling Windows which were used to predict the purchase amount of each model. The periods of prediction were at 1 month, 3 months, and 6 months. The efficacy of each model was compared using their errors. CNN-LSTM model produces the better forecasting results. The result also shows that 1-month forecasting period is suitable for medicines that specific to disease. The 3-month forecasting period is suitable for commonly used medicines. The 6-month forecasting period is suitable for the medicines for chronic diseases.

Keywords: Time Series, Multilayer Perceptron, Convolutional Network, Long Short-Term Memory.

iSAI2019 : R3-62

Analyzing behavior in nursing training toward grasping trainee's situation remotely

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Abstract: In nursing education, it is important to improve nursing ability, clinical training is conducted as part of this. It is conducted in parallel by many trainees. Therefore, it is very difficult for a teaching advisor to grasp many situations at the same time. This research goes toward realizing a remote situation grasping system in order to support teaching advisor to notice trainees who need teaching. In this paper, we analyzed differences of behavior between trainees based on nursing behavior data measured using sensors. Furthermore, we discussed the possibility of use for the supporting system based on the results.

Keywords: Analysing behavior, Clinical training, Nursing training, Multiple sensors, Grasping situation remotely.

iSAI2019 : R1-63

Using Conceptual Graph to Represent Semantic Relation of Thai Facebook Posts in Marketing

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Abstract: Conceptual Graph is a representation commonly used to express semantic relationship of natural language. This work presents a method to translate Thai natural language text to conceptual graphs regarding semantic relations based on semantic roles between predicate and its arguments. Shallowing parsing of Thai text and verb patterns as case frames are utilised in identifying core entities in a context and their semantic roles. Then, the argument with annotated roles are translated into conceptual graphs that are able to logically and visually represent relations of core terms. As a result, conceptual graphs of Thai natural texts from Facebook posts in a marketing group were generated. In the study, found issues regarding Thai specific natural style are encountered and discussed.

Keywords: Semantic Relation, Conceptual Graph, Information Extraction, Semantic Role.

iSAI2019 : R4-64

Object Distance Estimation with Machine Learning Algorithms for Stereo Vision

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Abstract: This paper presents a novel distance estimation to calculate distances from the stereo camera to the object accurately. This study collected stereo camera images as a dataset, each object determined at two different lighting environments and five different distances between the stereo camera and the object. To estimate the distance, researchers applied supervised learning methods to approach this task. There were performed with two machine learning algorithms: Linear Regression, and Artificial Neuron Network Regression. In the experimental results, the efficiency of the proposed method was examined by using the evaluation metrics to calculate the distance estimation errors. The results showed the model of convolutional neuron networks operated with densely connected neuron networks has the lowest errors rate in comparison with other models. The model eliminates the error rate of distance estimation at 0.000531, 0.014490, and 0.000048 meters, measured by mean square error, mean absolute error and mean logarithmic error respectively.

Keywords: stereo camera, distance estimation, deep learning, regression.

iSAI2019 : R4-65

Automatic Football Match Event Detection from the Scoreboard using a Single-Shot MultiBox Detector

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Abstract: During a football match, the information is manually collected by humans. However, the correctness of the football match data is difficult to check because of the game's speed, and thus, human errors can occur. This paper presents an automatic football match event detection from the scoreboard using a deep learning algorithm. The proposed method can reduce human error and performs the detection faster. The study included 68 match of English English Premier League 2017-2018 broadcast videos and tested with 80 testing videos. These videos were prepared from 20 matches broadcast videos, which consisted of twelve matches from the year 2017-2018 and eight matches from the year 2018-2019. The proposed method contains three main steps: data gathering and augmentation, object detection for scoreboard visualization forms, and the event classification. The scoreboard detection is performed with an SSD. The event classification employs the majority vote and time frame technique. The experimental results show an accuracy rate of 1.00 with the expected event scoreboards, comprised of Goal, Substitution, and Card events.

Keywords: football match, data augmentation, image processing, deep learning, object detection.

iSAI2019 : R4-66

A Light-Weight Deep Convolutional Neural Network for Speech Emotion Recognition using Mel-Spectrograms

Kamin Atsavasirilert[1] , Thanaruk Theeramunkong[1] , Sasiporn Usanavasin[1] , Anocha Rugchatjaroen [2] , Surasak Boonkla[2] , Jessada Karnjana[2] , Suthum Keerativittayanun [1,2] and Manabu Okumura[3]
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Abstract: At present, speech emotion recognition is a challenging field of studies about emotions of speakers. Speech emotion recognition also enhances interaction between humans and machines. In many situations (e.g. embedded systems), we have to detect emotion in speech within limitation of both computing and memory resources. Even several previous works reported that a reasonable recognition rate can be achieved using transfer learning techniques with popular models, such as AlexNet, they suffered with a large model size and can not be executed on an embedded system. To address this problem, we propose a lightweight deep convolutional neural network architecture, which utilizes only partial component of the AlexNet with Log-MelSpectrograms as input. Our result shows that the proposed lightweight model can achieve a comparable recognition rate with the state of the art, but the number of parameters used in our model decreases around 272 times from the AlexNet.

Keywords: speech emotion recognition, Mel-spectrogram, light-weight model, convolutional neural network, deep learning.

iSAI2019 : R5-67

The Development of Eyes Tracking System in Smartphone for Disabled Arm Person

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Abstract: This research objectives were to design and develop algorithms for detecting and tracking human eye movements. The Researchers use image processing techniques combined with Haar Classifier and Region of interest for control eye. The system designed to control the operation of the eyes to perform the functions of controlling the smart phone. The researcher simulating cursor with microcontroller. The result is showed that system can detect face and eye precisely. The accuracy of this test is 78 percent.

Keywords: smartphone, image processing technique, HaarLike Model.

iSAI2019 : R4-68

Design and Implementation of A Smart Shopping Basket Based on IoT Technology

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Abstract: In metro cities we can see people a huge rush at shopping malls on holidays and weekends. This becomes even more when there are huge offers and discounts. Today purchasing various products in supermarkets require a trolley or a basket. However, the product procurement represents a complex process. Each time customers have to carry the basket for getting the items and placing them in the basket and also they has to take care of expense computation. After shopping, most customers have to wait in a long queue for product scanning and bill payment. Therefore for dealing with this problems, developing a smart basket for shopping is presented in this research. Each and every product commonly contains barcode tag. The smart basket will consists of a barcode reader of mobile phone. When the customer scans and places any product in the basket, cost and the name of the product will be displayed on display mobile phone. The sum total cost of all the products will be added to the final bill, which will be stored in the micro controller memory. It will transfer the product information of the items placed in the basket using a transmitter to the main computer. Weight sensor system on the basket is used to validate in the shopping process accuracy. So, the proposed basket will support to avoid waiting in billing queue while constantly thinking about the budget.

Keywords: smart shopping cart, Internet of Things (IoT), weight sensor, load cell.

iSAI2019 : R5-70

Short circuit/Fault Current Notification in Subtransmission system by Message Cellular Network

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Abstract: This paper was studied the preliminary system of short circuit current detection in sub-transmission system.It can utilize rapidly working staff for the Province Electrical Authority (PEA) and PEA's control center to limit the investigative area of contingency circuits. So the short-circuit or over current is the problem in electrical transmission line network, what to effected the damageable electrical protection devices such as fuse, circuit breaker etc. it's cause to occur the back-out event. It need spend several time to repair. For this research have proposed the automatic short-circuit current warning system via a mobile phone network by microcontroller processing. This system can be monitor the current value in real time short circuit condition using the current transformer device 1 set per 1 phase at all three phase. If the one of three phase current values exceeded the specified value. The system detector would send the current value in form short message service (SMS) to the mobile phone the specified number. It could be monitor that measured current values at any time all three phase. Finally, the experimental results in 3 area as Petchaburi's PEA, PEA-substation and Big-C department store, they could detect short-circuit current in sub-transmission line any area.As the results have correct measuring current average 98.78%. This system can help to monitor and repair the sub-transmission line/ sub-feeder rapidly.

Keywords: short circuit current detection, sub-transmission line, short message notification.

iSAI2019 : R4-71

Adaptive e-Learning Recommendation Model Based on Multiple Intelligence

Thaksaorn Jommanop[1] and Sakorn Mekruksavanich[2]
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Abstract: E-learning has offered numerous advantages such as flexibility, remote operability, cost effectiveness, simplicity, consistency and many more. The utilization of smart tools and technologies has provided easy and convenient education in an effective way without barrier of time and place. The purposes of this research were to 1) to synthesize a conceptual framework of collaborative and adaptive e-Learning for student with different multiple intelligences, 2) to develop the adaptive e-Learning, 3) to study the students'learning achievement after using multiple intelligence models and 4) to study the students satisfaction after using multiple intelligence models in innovation and information technology in education subject for student in school of teacher education, Phayao university.

Keywords: collaborative learning, adaptive e-Learning, multiple intelligence, instructional technology.

iSAI2019 : R1-72

Statistical Machine Translation between Kachin and Rawang

Ye Kyaw Thu, Manar Hti Seng Manar Hti Seng, Thazin Myint Oo Thazin Myint Oo, Dee Wom Dee Wom, Hpau Myang Thint Nu Hpau Myang Thint Nu, Seng Mai Seng Mai, Thepchai Supnithi and Khin Mar Soe Khin Mar Soe

Abstract: This paper contributes the first evaluation of the quality of machine translation between Kachin and Rawang. We also developed a KachinRawang parallel corpus (around 10K sentences) based on the Myanmar language of ASEAN MT corpus. The 10 folds cross-validation experiments were carried out using three different statistical machine translation approaches: phrase-based, hierarchical phrase-based, and the operation sequence model (OSM). The results show that all three statistical machine translation approaches give higher and comparable BLEU and RIBES scores for both Kachin to Rawang and Rawang to Kachin machine translations. OSM approach achieved the highest BLEU and RIBES scores among three approaches machine translation.

Keywords: Statistical Machine Translation, Under-resourced languages, Dialects, Kachin, Rawang.

iSAI2019 : R3-73

Predicting learning organization factors that affect performance by data mining techniques.

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Abstract: This research proposed factors and model affecting performance in learning organization prediction by using the classification techniques. Results show learning organization factors affecting performance composed of 8 factors including personality factors focusing on excellence, learning dynamics, common vision factors, team learning factors, workload factor, and performance factor. Comparison of classification models showed that SVM technique was the most suitable technique in prediction of learning organization affecting employees performance in the Bank for agriculture and Agricultural Cooperatives in the western region with 98.33% of accuracy, 0.025 of precision, and 0.984 of recall values.

Keywords: learning organization, Data Classification, Decision tree, Naïve Bayes, support Vector Machine.

iSAI2019 : R1-74

A Supportive Environment for Knowledge Construction based on Semantic Web Technology : A Case Study in a Cultural Domain

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Abstract: It is indisputable that the process of knowledge construction and knowledge management require a lot of collaborations from many stakeholders such as domain experts and knowledge engineers. To effectively model the knowledge in ontology representation, which can serve business applications and organization's goals, we need tools to support and to facilitate the collaborative works and activities among many stakeholders. In this paper, we propose a CD-OAM framework that provides a supportive environment based on the collaborative development (COD) approach. In this framework, stakeholders can communicate and share their understandings and comments during the process of ontology design in order to improve the quality of the knowledge model. To demonstrate how our approach and framework can support the collaborations and knowledge integrations among multiple domain experts and knowledge engineers, we selected a case study in cultural domain because the cultural knowledge is complex and requires various experts to design the ontology. The key contributions of our framework are: (1) presenting an improvement of collaborative activities through a supportive environment based on the COD approach, and (2) demonstrating a collaborative situation to overcome limitations of a communication between domain exports and knowledge engineers.

Keywords: Knowledge Construction, Collaboration, Ontology Engineering, Semantic Web Technology.

iSAI2019 : R5-76

Voltage Failure Warning Device for 3-Phase Transformer

LUECHAI PROMRATRAK

Abstract: The purpose of this research is firstly to study the operation of the Arduino micro device and then to create a prototype of a 3-phase low voltage failure warning device. Second is to test effectiveness of the device with a 3-phase variable transformer via simulation. Finally, is to install the prototype in the low voltage distribution system of the Provincial Electricity Authority. The device has an Arduino micro R3 for data processing; ESP8266 expansion board for WIFI receiver/transmitter and EFDV434 board for interfacing with voltage sensing while displaying status message via line application when failure occurs. The experimental test results indicate that the prototype device has low voltage variation of ± 5.42% with actual accuracy greater than 90%. The warning can operate with the distance of 15 meters with sound levels between 80 to 87 dB.

Keywords: Low Voltage detection, 3-Phase transformer.

iSAI2019 : R3-77

Gender Recognition from Facial Images using Local Gradient Feature Descriptors

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Abstract: Local gradient feature descriptors have been proposed to calculate the invariant feature vector. These local gradient methods are very fast to compute the feature vector and achieved very high recognition accuracy when combined with the support vector machine (SVM) classifier. Hence, they have been proposed to solve many problems in image recognition, such as the human face, object, plant, and animal recognition. In this paper, we propose the use of the Haarcascade classifier for the face detection and the local gradient feature descriptors combined with the SVM classifier to solve the gender recognition problem. We detected 4,624 face images from the ColorFERET dataset. The face images data used in gender recognition included 2,854 male and 1,770 female images, respectively. We divided the dataset into train and test set using 2-fold and 10-fold cross-validation. First, we experimented on 2-fold cross-validation, the results showed that the histogram of oriented gradient (HOG) descriptor outperforms the scale-invariant feature transform (SIFT) descriptor when combined with the support vector machine (SVM) algorithm. The accuracy of the HOG+SVM and the SIFT+SVM were 96.50% and 95.98%. Second, we experimented on 10-fold cross-validation and the SIFT+SVM showed high performance with an accuracy of 99.20%. We discovered that the SIFT+SVM method needed more training data when creating the model. On the other hand, the HOG+SVM method provided better accuracy when the training data was insufficient.

Keywords: gender recognition, face detection, local gradient feature descriptor, support vector machine.

iSAI2019 : R3-78

Develop the Framework Conception for Hybrid Indoor Navigation for Monitoring inside Building using Quadcopter

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Abstract: Building security is crucial, but guards and CCTV may be inadequate for monitoring all areas. A quadcopter (drone) with manual and autonomous control was used in a trial mission in this project. Generally, all drones can stream live video and take photos. They can also be adapted to assist better decision-making in emergencies that occur inside a building. In this paper, we show how to improve a quadcopter's ability to fly indoors, detect obstacles and react appropriately. This paper represents a new conceptual framework of hybrid indoor navigation ontology that analyzes a regular indoor route, including detection and avoidance of obstacles for the auto-pilot. An experiment with the system demonstrates improvements that occur in building surveillance and maintaining real-time situational awareness. The immediate objective is to show that the drone can serve as a reliable tool in security operations in a building environment.

Keywords: semi-autonomous quadcopter; indoor navigation; object detection; image processing; ontology.

iSAI2019 : R4-79

DDOS Attack Detection & Prevention in SDN using OpenFlow Statistics

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Abstract: Software defined Network is a network defined by software, which is one of the important feature which makes the legacy old networks to be flexible for dynamic configuration and so can cater to today's dynamic application requirement. It is a programmable network but it is prone to different type of attacks due to its centralized architecture. The author proposed a method to detect and prevent DDOS attack in the paper. Mininet [5] which is a popular emulator for Software defined Network is used. We followed the approach in which collection of the traffic statistics from the various switches is done. After collection we calculated the packet rate and bandwidth which shoots up to high values when attack take place. The abrupt increase detects the attack which is then prevented by changing the forwarding logic of the host nodes to drop the packets instead of forwarding. After this, no more packets will be forwarded and then we also delete the forwarding rule in the flow table. Hence, we are finding out the change in packet rate and bandwidth to detect the attack and to prevent the attack we modify the forwarding logic of the switch flow table to drop the packets coming from malicious host instead of forwarding it.

Keywords: SDN, Mininet, Network attack, Traffic simulation, DDOS.

Author Index

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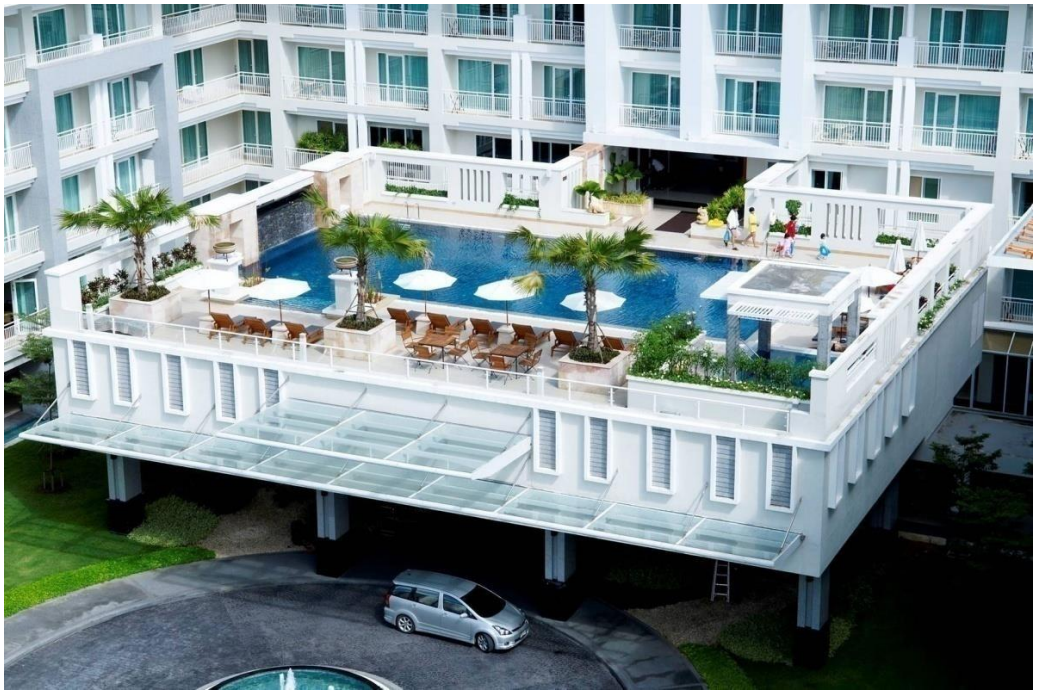

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