Assumption University (AU) of Thailand

**Motto:** Labor Omnia Vincit

**Philosophy:** In loyalty to its Christian mission, Assumption University stands for:
- the inculcation of respect for the three institutions of the Nation: Religion, Country, the King and a democratic way of life.
- the belief that a man justifies himself and his existence by the nobility of his work.
- the commitment to be a light that leads men towards the true source of all knowledge and life.

**Accreditation:** The University is fully accredited by the Office of the Higher Education Commission (OHEC), Ministry of Education. Its graduates enjoy the privileges accorded to State University graduates. Its academic standards are accepted by the Civil Service Commission of Thailand. Assumption University is recognized in the USA and other countries and the transfer of credits from the University are accepted abroad. Graduates from the University can pursue advanced degrees anywhere in the world. Assumption University is listed in the Handbook of Universities and other Institutions of the International Association of Universities in Paris, France.

**The University is recognized by:**
- The Association of Christian Universities and Colleges in Asia (ACUCA);
- The Association of Southeast Asian Institutions of Higher Learning (ASAIHL); and
- The International Federation of Catholic Universities (IFCU).

**Objectives and Policies:** Assumption University exists for the main purpose of serving the nation by providing scientific and humanistic knowledge, particularly in the fields of business education and management science through research and interdisciplinary approaches. To this end it aims at forming intellectual competent graduates who:
- are morally sound, committed to acting justly, and open to further growth.
- appreciate freedom of expression, imbibe right attitudes and ideologies through a careful integrated curriculum of Ethics, Science, Languages and Business Management.
- achieve academic excellence through hard work, critical thinking, and effective decision-making.

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- Finance and Banking (B.B.A.)
- Accounting (B.B.A.)
- Business Information Systems (B.B.A.)
- Hospitality and Tourism Management (B.B.A.)
- International Business Management (B.B.A.)
- Real Estate (B.B.A.)
- Industrial Management (B.B.A.)
- Insurance (B.B.A.)
- AU - Wollongong Program (B.B.A.) (University of Wollongong Australia)*
- AU - Dominican Double Degree Program (B.B.A.) (Dominican University of California, USA)
- Business Economics (B.Econ.)
- Management (Commerce Concentration) (B.B.A.)

**School of Arts**
- Business English (B.A.)
- Business French (B.A.)
- Business Chinese (B.A.)
- Business Japanese (B.A.)
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**School of Law**
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**School of Biotechnology**
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* Joint program with foreign university

**School of Science and Technology**
- Computer Science (B.S.)
- Information Technology (B.S.)
- Telecommunications Science (B.S.)
- Business Data Analysis (B.S.)
- Technology Management (B.S.)

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- Computer and Network Engineering (B.Eng.)
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**School of Nursing Science**
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**Albert Laurence of Communication Arts**
- Advertising (B.Com.Arts)
- Public Relations (B.Com.Arts)
- New Media Communication (B.Com.Arts)
- Performance Communication (B.Com.Arts)
- Visual Communication Arts (B.A.)
- Computer Generated Imagery (B.A.)

**Montfort del Rosario School of Architecture and Design**
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- Interior Architecture (B.Arch.)
- Interior Design (B.F.A.)
- Product Design (B.F.A.)

**School of Music**
- Music Business (B.A.)
- Music Performance (B.A.)

(Continued on the inside back cover)
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Assumption University

at

International Scientific Meetings

From July 2012 to June 2013

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Preface

Being an institute of higher learning, and the first international university in Thailand, Assumption University has a definite policy to provide quality instruction to the students, both undergraduates and graduates, and both Thai and foreign nationals. An equally important function of the University is to conduct research in all fields.

Assumption University is one of the leading universities in the field of science and technology. During the past year, several of our lecturers and students participated in various international meetings held in Thailand and abroad; many have also presented their papers at these meetings. The management of Assumption University is proud of their performance and achievements.

To display and maintain a record of their endeavors and achievements, and to encourage other lecturers and students to make similar contributions, all abstracts of scientific papers presented at the international scientific meetings during this one-year period from July 2012 to June 2013, have been compiled and published for distribution to interested individuals and institutions. The present publication is the fifteenth issue of the series of the AU Abstracts, published annually. The first one, ‘AU Abstracts - 1999’ was published in September 1999, covering the presentation period from May 1998 to June 1999. Subsequent publications of the series were published in July covering a period from July of the previous year to June of the next year.

Originally, the Office of the AU Journal of Technology who initiated this publication, was charged with the responsibility to cover the activities of five ‘technology-based’ schools, namely: Montfort del Rosario School of Architecture and Design, School of Biotechnology, School of Engineering, School of Nursing Science, and School of Science and Technology.

It is hoped that this small publication would be of some benefit to our readers and that it will serve a dual purpose, relaying information, as well as an encouragement to all lecturers and students of the ‘technology based’ schools. It is our desire to continue to present this particular series and publication every year.

On behalf of Assumption University, I wish to express my sincere thanks to Dr. Narong Chomchalow, Editor of the AU Journal of Technology, for his initiative, as well as hard work in compiling, overseeing, and preparing the manuscripts of the AU Abstracts - 2013. I also wish to thank Dr. Dobri Atanassov Batovski, Deputy Editor of the AU Journal of Technology, who assisted in verifying the abstracts of this publication.

Rev. Bro. Dr. Bancha Saenghiran, FSG
Rector Magnificus, Assumption University
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Montfort del Rosario School of Architecture and Design

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3. Thai Traditional House: A Case of House as Vanguard against Social Anomie
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Visitor Perception in Architectural Monument: Case Study of the Historic City of Ayutthaya

Patiphol Yodsurang

Department of Architecture, Montfort del Rosario School of Architecture and Design

Architecture can speak for itself, but nowadays a large section of people visually illiterate. The new generations of visitors, who have not an eye for architecture, have no ability to read and learn architecture and its environment. Heritage Interpretation is presented in ways that help visitors discover the hidden messages in historical monuments and be understood by its visual elements.

The Historic City of Ayutthaya is listed as the World Heritage which expresses ideas, beliefs, and creativity of Ayutthaya people. It is subsequently extremely popular for Siamese architecture. The problem is those surviving monuments of Ayutthaya are mainly of brick structure and most of them had fallen off. Yet, the physical remaining in the Historic City might lose some potential in visual presentation in architecture. In designing of interpretation programmes or service, it is indispensable to create them sense and aware of its existence in its visual elements of building.

In order to improve the existing interpretation service, and analyze the current situation, problem faced, limitation, and restriction in-situ, this study has pointed out the importance of architectural monument interpretation and presented the way general visitors perceive a message from heritage, particular in the complex of architectural monuments in the historic city of Ayutthaya. A wide variety of heritage attraction and visitors motivation in Ayutthaya had reflected on how they can access visual information from architecture. The database can be used for determining and proposing of the interpretation framework and strategies model to catch up on the new visitor’s interest. The Historic city of Ayutthaya will become the complete source of learning outside the classroom, which cultural tourism will be followed by.

Keywords: Interpretation, tourism, architectural heritage, historic city of Ayutthaya, world heritage.


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Conservation Strategies in Historic Urban Landscape: 
Local Practice in a World Heritage Site of Bhaktapur

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Impact of rapid and uncontrolled urbanization in many developing countries causes fragmentation to social and urban fabric. The historical layer is consequently lost in its authenticity and integrity of urban space, where the true community values exist. The lack of responsive conservation and management strategies on the changing of historic urban landscape can cause a greatly affect to a contemporary livelihood. In order to preserve its values, a comprehensive traditional and innovative method is needed and applied to the local contexts, in particular a local-level government.

The city of Bhaktapur, is listed as one of the seven compounds of Kathmandu Valley- the World Heritage Site, one of the three major cities of the Great Malia Period (twelfth to fifteenth century). Many of ancient monuments were built throughout the city. Various shaped and sized monuments were immersed in a contemporary city's fabric, and still continuing traditions give shape to the historic city. Religious structures and sacred spaces embed the outstanding architectural characteristic enriching people's lives coincide. The linkage from the past made this ancient city livable. Over 60 years of conservation and restoration movement in Kathmandu Valley, the local practice in Bhaktapur municipality tries to mobilizing the local available cultural resources to improve people's livelihood and giving people a better standard of living. Many successfully preserved and reconstructed important temples, monuments, and other culturally significant structures were done through its Heritage Section. Yet, the budget was made by the Municipality itself.

The study addresses the complex issuing on the transformation of historic urban landscape in developing country. Local-level organization and implementation strategies in conservation and management, including conflict among stakeholders would be demonstrated. The database can be used and applied for determining and proposing of local-level management and implementation strategies in historic urban area.

Keywords: World heritage sites, Bhaktapur, conservation and management, cultural heritage, urban heritage, historic urban landscape.

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Thai Traditional House: A Case of House as Vanguard against Social Anomie

Chutarat Laomanacharoen$^{1/}$ and Prima Viriyavhadhana$^{2/}$

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Buddhism has been the national religion of Thailand for centuries hence the integration of the religion in almost all aspects of our lives. In a traditional Thai house, the manifestations of Buddhist wisdom within the space can be distinguished into two different ways: traditionally governed, and as integrated by occupants. The tradition or a "collective consciousness", based on Buddhist wisdom, governed the way the house is configured, which in turn acts as an instrument that conditions its occupants to be imbued in Buddhist wisdom hence resulting in a serene and peaceful society. In a society as fragmented as today, houses resonate with the vibes of modern lifestyle unconditionally as we seek for all conveniences that today's technology has to offer. As a result we are inevitably spoiled by our houses and wander aimlessly into consumerism traps of filling voids with materialistic notions. This modern society, which Emile Durkheim characterized as having 'organic solidarity', often lacks dependable social norms and members are eventually led into social anomie where confusion in social norms cause deviant behavior and chaos. This can also happen when a house falls to maintain its role in the social fabric as occupants may lose the sense of place in this world. Based on a pre-study on experiences of Thai house occupants, this paper explored and analyzed Thai traditional houses by using non-discursive technique within the framework of Configurational theory in order to understand the relationship between houses and social conditioning. Findings include configurational properties of traditional Thai houses in regulating social interaction and the relationship between spatial hierarchy and distance that can contribute to the feeling of control and territoriality. Within the context of discovery and theorizing this paper aims to contribute to an alternative theoretical framework for transcending houses into vehicles for positive social changes and vanguard against social anomie.

**Keywords:** Thai traditional house, configurational theory, built environment and social anomie.

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School of Biotechnology
School of Biotechnology


International Academic Forum (IAFOR), Osaka, Japan, 6-9 June 2013

1. A Study of Feasibility of Pretreatment Process to Utilize Lignocellulosic Biomass as Materials for Biodiesel Production
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A Study of Feasibility of Pretreatment Process to Utilize Lignocellulosic Biomass as Materials for Biodiesel Production

Malinee Sriariyanun 1/, Patchanee Yasurin 2/, Jirapa Phetsom 3/ and Kraipat Cheenkachorn 4/

2/ Department of Food Technology, School of Biotechnology

Biomass is the most abundant renewable resource in the world and has potential to use as alternative materials to fossil resources for production of chemicals and fuels. For the effective conversion from biomass to biofuels or other chemicals, it requires high efficient hydrolysis of cellulose to glucose or fermentable sugars. In this study, lignocellulosic biomass, rice straw, rice husk, and water hyacinth were pretreated with different chemicals, or pretreated with microwave heating, or with combination of chemicals and microwave heating. Pretreated biomass was saccharified by using commercial cellulase enzymes and released sugar contents were measured. The combination of two pretreatment methods exhibited a synergy effect with 71.77% of the enzymatic sugar conversion. To study the possibility to utilize sugars from saccharified biomass, the de novo biosynthesis of fatty acid ethyl esters (FAEEs) in Acinetobacter spp. were observed. The key biochemical reaction is the esterification between fatty acyl Co-A and ethanol using diacylglycerol acyltransferase (DGAT). The highest FAEE production up to 1,040±51 mg/l was found in A. baylyi culture that use biomass hydrolysate as a sole carbon source.

Keywords (Added by the Editor): Biofuels, microwave heating, cellulase enzymes, biomass hydrolysate.


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A Study of Feasibility to Utilize Lignocellulosic Biomass as Materials for Biodiesel Production

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¹Department of Food Technology, School of Biotechnology

Lignocellulosic biomass is a renewable, inexpensive, and abundant resource with high potential for biofuel production to implement the sustainable energy worldwide. The bottleneck of biofuel production is the recalcitration of lignocellulosic biomass to fermentable sugars. Searching for a novel cellulase, a biocatalyst is one of major challenges to promote biofuel production with economic and environmental friendly. Natural microorganism is the great source of cellulose production. Therefore the objective of this research is to identify thermophilic, rapid, efficient cellulose-degrading bacteria from organic fertilizer, rice field, activated sludge, and rain forest in Thailand. More than 300 isolates were screened at 45°C on carboxy-methyl-cellulose (CMC)-containing media to observe the cellulase activity. Using standard filter paper assay, only 9 isolates (S3-10, S3-20, L2-S1, L2-S2, S3-7, L3-S1, L11-S2, L11-S3, and L11-S4) showed high total cellulase activity among other isolates. All isolates then were cultured in media containing 4 different carbon sources; CMC, filter paper, untreated rice straw, nutrient broth (NB), to see effect of substrates on cellulase production. It showed that L2-S2 in Dubois salts media with rice straw could induce high total cellulase activity to 25.57 umole/mg-protein while L11-S3 in NB could induce the highest total cellulase activity to 27.92 umole/mg-protein. Therefore untreated rice straw and NB represented as an effective inducer for cellulase production. A portion of the 16srDNA genes of cellulase positive isolates were amplified and sequenced, then BLASTed to determine species. The results showed that most of isolates are Bacillus sp.

Keywords (Added by the Editor): Biofuel, recalcitration, fermentable sugars, cellulase, thermophilic.


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School of Engineering
School of Engineering

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Robust Compressed Sensing in Gaussian Noise Environment by Resampling with Replacement

Parichat Sermwuthisarn¹, Duangrat Gansawat², Vorapoj Patanavijit³ and Supatana Auethavekiat¹

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A reconstruction method using the ensemble of compressed measurement signals is proposed for reconstructing the image from the signal corrupted by Gaussian noise. The ensemble is created from one signal under the assumption that an image is highly redundant; hence, it is approximated as the mixture of a number of signals. The proposed method adopted the sampling with replacement in bootstrapping to extract L signals from the mixture. The extracted L signals from the ensemble of signals corrupted by Gaussian noise with the same mean and variance. The signals have different bases; thus, they he in different space. Orthogonal Matching Pursuit with Partially Known Support (OMP-PKS) is applied to reconstruct the L signals to the same sparse space. Gaussian noise is reduced by averaging the reconstructed signals. The performance of the proposed method was compared with Basis Pursuit Denoising (BPDN), OMP-PKS and Distributed Compressed Sensing using Simultaneously Orthogonal Matching Pursuit (DCS-SOMP). The experimental results of 10 standard test images showed that our method yielded higher Peak Signal-to-Noise Ratio (PSNR) and better visual quality at a high level of noise.

Keywords: Compressed sensing (CS), orthogonal matching pursuit with partially known support (OMP-PKS), distributed compressed sensing (DCS).


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Single Loop and Double Loop Balancing Control of AU Self-Balancing Bicycle (AUSB)

Narong Aphiratsakun and Kittiphan Techakittiroj

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This paper evaluates the controllers performance on AU Self-balancing Bicycle (AUSB). The gyroscope is used to sense the balanced position of the bicycle while an encoder is used to sense the position of the flywheel. The Single loop uses a gyroscope sensor and an additional encoder sensor is used in the Double loop. The main objective of this paper is to demonstrate the improvement in the performance of the AUSB. In the Single loop control, the bicycle can balance within a certain flywheel angle, and then the bicycle will fall. In the Double loop control, bicycle’s leaning angle and the flywheel’s position are controlled to be horizontal to the ground plane which give a better performance to the AUSB.

Keywords: AUSB, bicyrobo, double loop control, gyroscopic effect.


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Capacity and Fairness Analysis of Game Theoretic Power Controlled Wireless Access Network

Katan Vattanaviboon\textsuperscript{1/}, Patrachart Komolkiti\textsuperscript{2/} and Chaodit Aswakul\textsuperscript{1/}

\textsuperscript{2/} Department of Computer and Network Engineering, School of Engineering

In wireless networks, transmission power has adverse effects. With low transmission power, the received signal may be eclipsed by the noise and interference from other transmitters, resulting in low SINR. On the other hand, with high transmission power, the interference seen at other receivers could be too large, also resulting in low SINR. This paper aims to address this problem by using the game theory. Particularly, the scenario of wireless access network with two transmitters, each with two intended receivers, is considered. Selection of transmission power of the two transmitters is modeled as the two-person game, which would lead to a Nash Equilibrium in a non-cooperative scenario. However, with a proper power control, the scenario can become a cooperative game, with a possibility of operating at a Pareto optimum. Three utility functions are investigated, and the trade-off between capacity and fairness is analyzed.

**Keywords:** Wireless access network, power control, two-person game, utility function, fairness.

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Fast Image Restoration Technique for Car License Plate Based on PWS Filter Using 2DPCA Algorithm

Kanabadee Srisomboon\textsuperscript{1/}, Preecha Thongdit\textsuperscript{1/}, Wilaiporn Lee\textsuperscript{1/} and Vorapoj Patanavijit\textsuperscript{2/}

\textsuperscript{2/}Department of Computer and Network Engineering, School of Engineering

In this paper, we propose the algorithm that used to identify car license plate that the capture images come in degraded version by combining a PWS filtering technique with a 2DPCA algorithm. From experiment results, our algorithm has three advantages. First, it can be operated to the image directly without transforming the structure of the image, which is two dimensional data, into a vector. Second, it can be implemented with less burden of computation and requires less memory. At last, less time is required to restore the image.

**Keywords:** Wiener filter, PWS filter, PCA, 2DPCA.

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Email: <s.kanabadee@gmail.com; thongdit@gmail.com; wilaiporn.lee@gmail.com>.
A Novel Frequency Domain Image Reconstruction Based on the Tikhonov Regularization and Robust Estimation Technique for Compressive Sensing

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2/ School of Science and Technology

Recently, a lot of attention has been paid to image reconstruction algorithms based on Smoothed L0 (SL0) under the frequency domain. SL0 is fast and accurate under the noise free environment however it is unstable with the additional noise. According to ill-posed condition; without any prior information of the original image, the reconstruction procedure of SL0 is much affected by the noise. The frequency domain Tikhonov reduces and constrains the gap of restored image due to the ill-posed situation. Therefore, image restoration algorithm is better and immutable under the noise which can eliminate the image's properties. Moreover, in this paper we propose an $l^1$ norm estimation, it is conceived less sensitivity to the outlier than an $l^2$ norm. Therefore, the quality of reconstructed image under noise with high power is improved. Furthermore, the advanced robust regularization algorithm can be effectively applied under different type of noise models (such as Speckle noise, AWGN, Salt & Pepper noise and Poisson noise) and at different noise powers.

Keywords: Compressive sensing (CS), digital image reconstruction, SL0 algorithm, $l^1$ norm regularization, $l^1$ norm regularization, frequency domain, Tikhonov regularization.


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Improved Bandwidth Allocation in Cognitive Radio Network Based on Game Theory

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\textsuperscript{1} Department of Electrical and Electronics Engineering, School of Engineering
\textsuperscript{2} Department of Computer and Network Engineering, School of Engineering

In this paper, an improved method for bandwidth allocation in a Cognitive Radio Network based on game theory is presented. In this work, utility has been modified by inserting weights to the three terms, received power, interference to other links and interference from other links. Inserting weights enables us to treat different CRN scenarios separately and appropriately as per the requirement of the administrator. Moreover, a suitable performance index for a CRN that considers throughput and interference to other links has been introduced and is used to evaluate different schemes. Being able to segregate and individually treat the different utility terms has aided to analyze and understand the CRN better and at a deeper level, which will be helpful for further research work.

Keywords: Cognitive radio network (CRN), spectrum allocation, game theory, weight on utility terms.

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School of Nursing Science
School of Nursing Science

The Burapha University International Conference (BUU 2012), Theme: “Global Change: Opportunity and Risk”, Burapha University, Chon Buri, Thailand
Jomtien Palm Beach Hotel & Resort, Phatthaya, Chon Buri, Thailand, 9-11 July 2012

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The Effect of Language Handbook Guideline for Developing English and Arabic Speaking Proficiency of Nursing Staff in a Private Hospital Readiness for ASEAN Community

Siriporn Poonruksa
School of Nursing Science

At present time to 2015, ten countries in ASEAN are moving towards ASEAN community. Healthcare has been one of the priority sectors identified for accelerated economic integration. Mutual Recognition Arrangements on nursing service would strengthen professional capabilities by promoting the flow of relevant information and exchange of expertise, experience, and best practices suited to the specific needs of ASEAN member countries. Now, the top five customers in the private hospitals of Thailand are from countries that use English and Arabic languages for communication. So nurses should be able to train the conversation in Arabic and English languages effectively in order to convey message and provide nursing care that fit with the customers' need. In this study, Continuous Quality Improvement process and one group pre-test post-test experimental design were mutually applied which aimed to compare English and Arabic speaking proficiency of nursing staff before and after implementing a toll for the speaking skill development. Participants composed of 19 nurses and non-nurses who were purposively randomized into experiment group. Language handbook guideline was created based on information deriving from staff nurses' brain storming. The handbook details involved common vocabularies and sentences in nursing practice including customer greeting, admission and discharging, sign and symptom assessment, medication administration, and pre- and post-operative care. Content validity was tested by three international interpreters who have been spoken two languages. Pre-test of two languages was employed then the handbook was introduced to participants for practicing their communication. After one month, post-test was conducted and the results revealed that participants' speaking proficiency scores after practicing with handbook guideline were statistically significant increased. Moreover, they expressed high level of satisfactory score towards language guideline book. The research result was recommended to a nurse director to use this language handbook guideline continually for improving nursing staff speaking skill.

Keywords: Nursing staff, CQI, private hospital, English and Arabic proficiency, ASEAN community.


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Working Situations of Thai Nurses in Private Hospitals

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This mixed methods research aims to explore the situation of nurses’ work in the private hospitals. In a combined research of descriptive quantitative and qualitative parts, a phenomenological method was employed during May-October 2011. For the qualitative part, purposive sampling using inclusion criteria and snowball technique were used to recruit qualified key informants who are registered nurses experiencing either happiness or suffering in their professional nursing career. Forty-three nurses from different private health facilities all over the country participated in the study. Focus group discussions and in-depth interviews were used for data collection. For the quantitative part, cluster sampling was used to recruit registered nurses all over Thailand. Sample size was calculated. Self-administrative questionnaire was used for data collection. The results reveal that the quality of life in general does not recount the nurses' intention to stay in the nursing profession but does happiness, especially the happiness at work.

Keywords: Thai registered nurse, health, working situation, private hospital.


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The Accessibility on Breast Cancer Screening of Thai-Muslim Women in Bangkok Metropolitan

Siriporn Poonruksa

School of Nursing Science

Every two hours, one Thai woman dies because of breast cancer. The initial survey in Thai-Muslim communities indicated large numbers of women aged over thirty-five years with risk of breast cancer. Survey and phenomenological studies were conducted to examine causes contributing to breast cancer of Thai-Muslim women. One Thai-Muslim community in Bangkok was purposively randomized. Results revealed risky behaviors contributing to breast cancer in these women including low intake of dietary fiber, high starchy and fatty food consumption, obesity, and less exercise. Sixty-five percent of them were in risk of breast cancer because they have never received breast examination a year. In depth interview was applied to six village health volunteers and ten women aged over thirty-five years to analyze significant reasons of low accessibility on annual breast examination. Results indicated two main causes including women’s strict sex modesty and inequity system of Universal Coverage in which payment of breast examination was unlisted. It would recommend the involved people to reconsider the health accessibility policy, strengthen health promotion activity to reduce health risk behaviors on breast cancer, and increase breast self-examination competency of Thai-Muslim women.

Keywords: Accessibility, breast cancer, Thai-Muslim women.


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School of Science and Technology
The School of Science and Technology

The 4th International Conference on Knowledge and Smart Technology (KST 2012)
Knowledge and Smart Technology Research Center, Faculty of Informatics,
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10. A Thai Word Pronunciation Simulator Based on DFT Analysis and GA Search
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Experimental Study Efficiency of Robust Models of Lucas-Kanade Optical Flow Algorithms in the Present of Non-Gaussian Noise

Darun Kesrarat¹ and Vorapoj Patanavijit²

¹ Department of Information Technology, School of Science and Technology
² Department of Computer and Network Engineering, School of Engineering

This paper presents experimental efficiency study of noise tolerance model of spatial optical flow based on Lucas-Kanade (LK) algorithms such as original LK with kernel of Barron, Fleet, and Beauchemin (BFB), confidence based optical flow algorithm for high reliability (CRR), robust motion estimation methods using gradient orientation information (RGOI), and a novel robust and high reliability for Lucas-Kanade optical flow algorithm using median filter and confidence based technique (NRLK) under several Non-Gaussian Noise. These experiment results are comprehensively tested on several standard sequences (such as AKIYO, COASTGUARD, CONTAINER, and FOREMAN) that have differences speed, foreground and background movement characteristics in a level of 0.5 sub-pixel displacements. Each standard sequence has 6 sets of sequence included an original (no noise), Poisson Noise (PN), Salt & Pepper Noise (SPN) at density \(d = 0.005\) and \(d = 0.025\), Speckle Noise (SN) at variance \(v = 0.01\) and \(v = 0.05\) respectively which Peak Signal to Noise Ratio (PSNR) is concentrated as the performance indicator.

Keywords (Added by the Editor): Noise tolerance model, robust motion estimation methods, spatial optical flow, performance indicator.

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An Experimental Performance Analysis of Image Reconstruction Techniques under Both Gaussian and Non-Gaussian Noise Models

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Recently, the images reconstruction approaches are very essential in digital image processing (DIP), especially in terms of removing the noise contaminations and recovering the content of images. Each image reconstruction approach has different mathematical models. Therefore a performance of individual reconstruction approach is varied depending on several factors such as image characteristic, reconstruction mathematical model, noise model and noise intensity. Thus, this paper presents comprehensive experiments based on the comparisons of various reconstruction approaches under Gaussian and non-Gaussian noise models. The employing reconstruction approaches in this experiment are Inverse Filter, Wiener Filter, Regularized approach, Lucy-Richardson (L-R) approach, and Bayesian approach applied on mean, median, myriad, meridian filters together with several regularization techniques (such as non-regularization, Laplacian regularized, Markov Random Field (MRF) regularization, and one-side Bi-Total Variation (OS-BTV) regularization). Three standard images of Lena, Resolution Chart, and Susie (40th) are used for testing in this experiment. Noise models of Additive White Gaussian Noise (AWGN), Poisson, Salt & Pepper, and Speckle of various intensities are used to contaminate all these images. The comparison is done by varying the parameters of each approach until the best peak-signal-to-noise ratio (PSNR) is obtained. Therefore, PSNR plays a vital parameter for comparisons all the results of individual approaches.

**Keywords:** Digital image processing (DIP), digital image reconstruction, digital image enhancement.

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Multi-class Contour Preserving Classification

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The original contour preserving classification technique was proposed to improve the robustness and weight fault tolerance of a neural network applied with a two-class linearly separable problem. It was recently found to be improving the level of accuracy of two-class classification. This paper presents an augmentation of the original technique to improve the level of accuracy of multi-class classification by better preservation of the shape or distribution model of a multi-class problem. The test results on six real world multi-class datasets from UCI machine learning repository present that the proposed technique supports multi-class data and can improve the level of accuracy of multi-class classification more effectively.

Keywords: Contour preserving classification, data preprocessor, neural network, outpost vector, pattern classification.

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The Impact of Internet Banking Service on Customer Satisfaction in Thailand: A Case Study in Bangkok

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The purpose of this study was to find the Internet banking service dimensions that will have the impact on customer satisfaction among top three banks in the Bangkok area: Bangkok Bank, Kasikorn Bank and Siam Commercial Bank. Questionnaires were used to collect data from 450 respondents by using quota sampling. Multinomial logistic regression analysis was employed to obtain the important internet banking service dimensions that have the impact on customer satisfaction. Results showed that providing 24 hours - 7 days service, completing a task accurately, contacting staff to check immediately, providing accurate information & up to date, transaction process is fast, and providing online registration times were the important factors that have the impact on customer satisfaction.

Keywords: Customer satisfaction, Internet banking service, logistic regression analysis.


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A Self-Growing and Self-Organizing Batch Map with Automatic Stopping Condition

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This paper proposes a model of self-growing and self-organizing feature map designed to alleviate the difficulty of predetermining an appropriate size and shape of the feature map suitable for the input data in the applications of the Self-Organizing Map. The proposed model progressively builds a feature map by incremental growing of the network in a way that maintains two-dimensional regular grid structure and gradual adaptation of the reference vectors by coordinated competitive learning dynamics of the Batch Map algorithm. Experimental results based on iris data set and Italian olive oil data set show that the proposed model is effective in discovering an appropriate size and shape of the network grid to manifest a suitable feature map for the input data and that the resultant feature maps are comparable to feature maps produced by the standard SOM algorithm in their quality.

Keywords: Self-organizing feature maps, unsupervised learning, neural networks, data mining.

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Concerns Regarding Related Laws and Regulations for Myanmar’ eGovernment Legal Framework in ASEAN Perspective

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The increasing use of ICTs for commercial and administration activities, specifically in an Internet environment, requires laws and regulations to address a set of issues, such as the legal validity of electronic documents, e-signature, privacy, intellectual property rights, cybercrime, and building trust. This would require harmonized legal frameworks enabling international interoperability, for ICT itself, as well as systems for fighting the misuse of ICT for illegal and fraudulent purposes and providing ICT users worldwide protection regardless of their physical location.

This paper describes the concerns regarding related laws and regulations for eGovernment service provision at the national level for the Republic of the Union of Myanmar and the harmonization between Myanmar eGovernment Legal Framework and the Common Legal Framework for the ASEAN eGovernment which is being developed. It also provides an overview of the main aspects, actors and the working context of the Myanmar eGovernment Legal Framework Development.

Keywords: Myanmar’s ICT law, e-commerce laws, electronic signatures, ASEAN cyberlaw coverage, the e-ASEAN Legal Framework.


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A Comparative Study of Service Marketing Mix Factors Affecting on Consumers’ Purchasing Decision towards Coffee Shops in Thailand

Rangsan Nochai 1/ and Titida Nochai 2/

2/ Department of Business Data Analysis, School of Science and Technology

The purpose of this study was to make a comparative study in service marketing mix factors affecting on consumers’ purchasing decision towards top three coffee shops: Starbucks, Black Canyon and True Coffee in Bangkok area. Questionnaires were used to collect data from 400 people by using of quota sampling and convenience sampling. Data was analyzed by using Logistic Regression Analysis. The findings were shown that there were four factors affecting on consumers’ purchasing decision towards Starbucks, Black Canyon, and True Coffee as product, price, physical evidence, and people. In these factors, respondents focused on famous of coffee shop, reasonable price of coffee, menu and price available, comfortable chair and table, design-decoration, and friendliness of staffs. Therefore, the trader in coffee shop market can enhance more effectiveness of customers need, increase customer base and make more market shares in this segmentation by focusing on the strategy in price, launching of new variety menu and decoration of coffee shop in modern style with good atmosphere. These strategies should be developed continuously.

Keywords: Coffee shop, logistic regression analysis, consumers purchasing decision, service marketing mix.


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Experimental Efficiency Analysis in Robust Models of Spatial Correlation Optical Flow Methods under Non Gaussian Noisy Contamination

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In this paper, we present a performance analysis of several robust models of spatial correlation optical flow algorithms including an original spatial correlation optical flow (SCOF), bidirectional for high reliability optical flow (BHR), gradient orientation information for robust motion estimation (GOI), and robust and high reliability based on bidirectional symmetry and median motion estimation (RHR) under the non Gaussian noise conditions. The simulated results are tested on 4 different in foreground and background movement characteristics of standard sequences (AKIYO, CONTAINER, COASTGUARD, and FOREMAN) in a degree of 0.5 sub-pixel translation. In our experiment, an original sequence (no noise), and noise contaminated sequences on Salt & Pepper Noise (SPN) at density ($d$) = 0.025$d$, and 0.005$d$, Speckle Noise (SN) at variance ($v$) = 0.05$v$, and 0.01$v$, and Poisson Noise (PN) are utilized. The experiment concentrates on Peak Signal to Noise Ratio (PSNR) as an indicator in the experimental performance analysis.

Keywords (Added by the Editor): Spatial correlation optical flow, robust motion estimation, bidirectional symmetry, median motion estimation.

Presented at: The 10\textsuperscript{th} International Conference on Electrical Engineering/ Electronics, Computer, Telecommunications and Information Technology (ECTI-CON 2013), Krabi, Thailand, 15-17 May 2013.


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Performance Evaluation of Routing Protocols for Heterogeneous Mobile Ad Hoc Networks

Kunagorn Kunavut

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Routing protocols play an important role in Mobile Ad hoc Networks (MANETs) since they are necessarily required by all nodes in these networks to find the best paths to reach the other nodes. However, these protocols are usually measured/analyzed in homogeneous networks where all nodes in these networks have the same capabilities e.g. transmission range, transmitting power, link bandwidth and so on. Hence, homogeneous networks are not suitable for theoretical analysis, simulation measurement or performance testbed in the real applications because different types of nodes usually exist (or they are configured with different parameters). So, they practically have different characteristics and capabilities. This is called heterogeneous networks. In this work, various scenarios (e.g. load-, mobility- and density-varying conditions) are constructed to measure the performances of ad hoc routing protocols in heterogeneous networks. The protocols that are taken into consideration are DSR, AODV and OLSR since they are accepted by IETF MANET working group for standardization.

Keywords (Added by the Editor): Homogeneous networks, transmission range, transmitting power, link bandwidth.


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A Thai Word Pronunciation Simulator Based on DFT Analysis and GA Search

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This paper aims to present and discuss the concept of a Thai word pronunciation simulator based on DFT (Discrete Fourier Transform) analysis and GA (Genetic Algorithm) search. By DFT analysis, the simulator converts the sound of a Thai word from a foreign learner into its frames to get sound segments. The GA search on the sound segments generates a highest similarity sound value with a standard Thai sound. The GA search is supported by a library of original Thai word sounds. Once the simulator generates a real pronunciation of the learner’s word, it will store the sound data to train the user. The simulations presented in this paper indicate that the proposed approach is one of the most effective strategies of structuring a language trainer.

Keywords: Discrete Fourier transform, genetic algorithm, Thai word, pronunciation simulator, dynamic time warping algorithm.

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The Editor of the AU Journal of Technology cordially invites the staff of Assumption University who have presented, or have plan to present, their scientific papers, orally or as poster papers, in any international scientific meetings held in either Thailand or abroad, to submit their abstracts for inclusion in the forthcoming issue of ‘AU Abstracts - 2014’, to be issued in July 2014 which will cover the meetings that take place during July 2013 to June 2014. Kindly follow the format given in this issue. Please send the abstracts to the Editor through email <narongchc@au.edu> as soon as they are available. Please don’t wait until the last minutes to avoid delay in printing.

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Whereas ensuring that the information contained in this publication is accurate at the time of its publication (July 2013), Assumption University recognized that sections may be amended without prior notice, contingent upon changing circumstances or for any other reasons. Students should check with the university at the time of enrollment or registration, whether any updated information is available.

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Assumption University of Thailand

Motto: Labor Omnia Vincit

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