

PROCEEDINGS

CPITA-2019

**2nd International Conference on Contemporary
Research Practices in Engineering, IT
and Applied Sciences**

Venue: Hotel MyStays Shin-Osaka Conference Center, Japan

Osaka, Japan

Date: July 27-28, 2019



CONFERENCE BOOK OF ABSTRACT PROCEEDINGS

Consortium-ET

Consortium of Engineering & Technology



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Book of Abstracts Proceedings

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Proceedings of the 2nd International Conference on Contemporary Research Practices in Engineering, IT and Applied Sciences (CPITA)

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***2nd International Conference on Contemporary Research
Practices in Engineering, IT and Applied Sciences
(CPITA)***

Venue: Hotel MyStays Shin-Osaka Conference Center, Japan

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



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Conference Chair

Email: Michael@consortium-et.com

Prof. Robert Jacobs

Conference Supervisor

Email: contact@consortium-et.com

Natthawut Kaewpitoon (Ph.D.)

Conference Cordinator

Email: contact@consortium-et.com

CONFERENCE TRACKS

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

CONFERENCE CHAIR MESSAGE

Michael Sasaoka

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

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

Thank you.

Michael Sasaoka

Conference Chair

Email: contact@consortium-et.com

CONFERENCE AGENDA

DATE: July 27-28, 2019

LOCATION: Hotel MyStays Shin-Osaka Conference Center, Japan

Event Title: 2nd International Conference on Contemporary Research

Practices in Engineering, IT and Applied Sciences CPITA-2019

Start Time

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

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

CONFERENCE AGENDA

DATE: July 27-28, 2019

LOCATION: Hotel MyStays Shin-Osaka Conference Center, Japan

Event Title: 2nd International Conference on Contemporary Research

Practices in Engineering, IT and Applied Sciences CPITA-2019

10:00 am - 01:00 pm: First Presentation Session

Room 1

Track A: Business, Economics, Social Sciences & Humanities

Paper ID	Manuscript Title	Presenter Name
ISBMS-JUL-101	The Geographic Analysis on the Early Adopters of a New Technology- The Case of Mobile Payment in Taiwan	Chih Cheng Chen
ISBMS-JUL-102	The Forecasting on the Price of Bitcoin with the Application of ARIMA model in Machine Learning	Lee Yao Xian
ISBMS-JUL-106	Residential versus Organizational Preferences toward Logo of Property Developer in Thailand	Mittheera Leelayudthyothin
ISBMS-JUL-110	The Study of Business Model for Cross-border E-commerce	Chen-I Huanag
ISBMS-JUL-111	Relationships among Expectation, Satisfaction and Revisit intention of Tourist: A Case Study of Outbound Vietnam Tourism	Luong The Bao
ISBMS-JUL-112	Design and pre-implementation assessment survey of an online-based information system for Abdou Moumouni University of Niger	Assao Neino Alu
ISBMS-JUL-113	International Tourists Decision Making of Choosing Vietnam as a Travel Destination	Jiin Ling Lin
TPMR19-07-104	CFOs versus CEOs: Risk-Taking Incentives and Decisions of Seasoned Equity Issues and Repurchases	Dr. Han-Ching Huang
TPMR19-07-106	In Dialogue with Nature: Experiential Learning through Farming in University Common Core Science General Education	Dr. Ming Li
TPMR19-07-118	The Economic Impact of Drought on Agricultural Land Sustainability: The Case of Californias Central Valley	Pei Xu
TPMR19-07-119	The Influence of "Affective Embodiment Creativity Training" on the Promotion of Perceptual Acumen and Creativity	Althea Y. CHEN
TPMR19-07-122	Idea Recognition: Revealing Fashion Entrepreneurs Start Up Process	Lizhu Y. Davis
TPMR19-07-114	Impact of Learning Method on Entrepreneurial Intention and Entrepreneurial Education of Undergraduate Students: A Case Study of a Private University in Thailand	Chanita Jiratchot

Track B: Medical, Medicine and Health Sciences

OSA-479-103M	Characterization of Fosfomycin Resistance and Underlying Mechanism(s) in Klebsiella Pneumoniae Clinical Isolates	Dr. Jin Town Wang
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Lunch Break (01:00 pm - 02:00 pm)

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Practices in Engineering, IT and Applied Sciences CPITA-2019

02:00 pm - 04:00 pm: Second Presentation Session

Room 1

Track C: Engineering, Technology & Applied Sciences

Paper ID	Manuscript Title	Presenter Name
NTEA19-07-111	Automating Color Image Enhancement Based on Image Type Classification and Image Quality Assessment	Ying-Cheng Lin
CIPTA-JULY2019-102	Dynamic Resource Allocation based on Reinforcement Learning and QoS for D2D Underlay Networks	Jia-Hao Xu
CIPTA-JULY2019-103	Metal Sheets Scratch Detection System Based on Fpga Image Processing	Rui-Tang Huang
CIPTA-JULY2019-104	An Automatic Tree Rings Detection Platform based on FPGA	Miao Ou Yang
CIPTA-JULY2019-106	Femtomolar Detection of Dopamine by Using Silicon Nanowires Field-Effect Transistors Integrated Ultra-Low Power CMOS Readout IC	Shu-Ping Lin
CIPTA-JULY2019-107	Power Control for D2D Resource Allocation Based on Reinforcement Learning	Wen-Jun Lin
CIPTA-JULY2019-108	The Investigation of Characterization, Biocompatibility, and Hemocompatibility of Modified Thermoplastic Polyurethane	Yen-Chung Lu

Ending Note (04:00 pm - 05:00 pm)

CONFERENCE AGENDA

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Practices in Engineering, IT and Applied Sciences CPITA-2019

Conference Day 02 (July 28, 2019)

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



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TRACK A

BUSINESS, ECONOMICS, SOCIAL SCIENCES & HUMANITIES

CFOs versus CEOs: Risk-Taking Incentives and Decisions of Seasoned Equity Issues and Repurchases

^{1*}Han-Ching Huang, ²Pei-Shan Tung

¹Department of Finance, Chung Yuan Christian University, Taiwan, ²Financial Research Institute at Taiwan Academy of Banking and Finance, Taiwan

Corresponding Email: samprass@cycu.edu.tw

Keywords: Chief Executive Officer (CEO), Chief Financial Officer (CFO), risk-taking incentive

This paper explores the impact of the equity incentives of Chief Executive Officers (CEOs) and Chief Financial Officers (CFOs) on the decisions of seasoned equity issues (SEO) and repurchases. A popular reason that a firm repurchases is the availability of free cash flow. Sonika et al. (2014) find that firms are prone to implement repurchase programs when exposed to higher systematic risk and lower idiosyncratic risk. Consistent with Croci and Petmezas (2015), which indicate that higher risk-taking incentives result in greater acquisition investments, we find that higher risk-taking incentives have impacts on greater probability that firms conduct a repurchase program. Moreover, this paper finds that higher risk-taking incentives of CFOs have higher absolute impacts on the probability that firm conducts repurchases than those of CEOs since the decisions about repurchase involve more specialized judgment on the part of finance team. Traditionally, market timing is regarded as the most prominent explanation for SEOs. Nevertheless, DeAngelo et al. (2010) find that the foundational reason most firms conduct SEOs is to meet a near-term cash need. We find that higher risk-taking incentives have greater impacts on the probability that firm conducts a SEO, which is consistent with Croci and Petmezas (2015). Specifically, higher risk-taking incentives of CFOs have higher absolute impacts on the probability that firm conducts SEOs than those of CEOs since CFOs are more directly responsible for SEO than CEOs.

In Dialogue with Nature: Experiential Learning through Farming in University Common Core Science General Education

*Dr. Ming Li

Office of University General Education, The Chinese University of Hong Kong, Hong
Kong

Corresponding Email: liming@cuhk.edu.hk

Keywords: In Dialogue with Nature, General Education, Experiential Learning, Farming, Agriculture.

Agriculture embraces interdisciplinary arts which combine scientific knowledge with the traditional wisdom to support civilizations. It has faced tremendous challenges caused by global issues such as overpopulation, climate change, pollution, environmental equity, human rights, and other social politics. Full awareness of these global issues is crucial for general education in the 21st Century. Complementary to conventional teaching, experiential learning has been well recognized for its pedagogical benefits. The objective of this study is to investigate the effect of introducing experiential learning through farming on the teaching and learning general education. Started from the academic year 2015-16, experiential learning through farming had been designed and implemented in a common core science general education course in Hong Kong. A total of 101 year-one and year-two university students from different disciplines had joined the experiential learning through farming, in which hands-on farming was practiced followed by interactive discussion sessions. Quantitative surveys and qualitative feedbacks revealed that the experiential learning through farming deepened students understanding of the course materials, fostered their reflection on the environmental, social and policy issues, as well as the science and techniques in agriculture. Experiential learning through farming did not only enrich students learning experience but also reinforced the connection between textbook knowledge and real-life situations in society. Students can apply their scientific knowledge, face the struggles of using scientific technology, feel the dilemma of choosing different living styles, experience the impact of the global environmental issues, and taste the urgency for sustainable developments. This study provides insightful findings and references for the introduction of experiential learning through farming on teaching and learning general education. Given the diverse aspects and interdisciplinary nature of agriculture, this practice could be extended to other general education courses, such as humanity courses, so that the students can become better global citizens.

The Hyper-Connectivity Network Society And Occupational Ethics The Economic Impact of Drought on Agricultural Land Sustainability: The Case of Californias Central Valley

*Pei Xu

Agribusiness Department, California State University Fresno, USA
Corresponding Email: p xu@mail.fresnostate.edu

Keywords: Land Sustainability, Economic.

Of Californias 100 million acres of land, 43 million acres are used for food production (CDEA, 2016). The on-going drought is putting wide-ranging pressure on the regions agricultural real estate values. One direct impact is the depreciation in farm values and the loss of farmland. More than 500,000 acres of farm land were fallowed in 2016, as a result of water shortage (Water and Drought, 2016). The already challenging situation was compounded by the uncertainty of future drought years. The 2018 valley winter rain and snowpack survey, two important gauges of the valleys water supply, had shown drought as an even bigger concern of many farmers (The Fresno Bee, 2018) and it was reported that more farmland were put into the marketplace. This study examines the impact of drought on sustainability of farm land use in the largest food production region of central California in U.S.A. Results from a factor analyses and a Probit model using data gathered from 24 farmers in spring 2019 show that droughts are a direct impact of land sales in central valley. With water shortage, farm related land use decisions were significantly impacted and droughts have brought substantial financial pressure to the farming community. Nuts, fruits and vegetable growers all felt excessive value decline of their land as a result of unpredictable water situation. The study provides invaluable information for the help of proposing specific agricultural policy recommendations and the plan for enhanced adaptation of farming in Central Valley to future droughts.

The Influence of Affective Embodiment Creativity Training on the Promotion of Perceptual Acumen and Creativity

^{1*}Althea Y. CHEN, ²Wen-Yin Chen, ³Ko-Chiu Wu
^{1,2,3}National Taipei University of Technology, Taiwan
Corresponding Email: mugi3112@gmail.com

Keywords: Affective Embodiment, Design Education, Creativity Training, Psychology of Art, Innovation Thinking.

This study designs a creative thinking training that enhances perceptual acuity and applies to the arts, humanities and design courses. It is expected to enhance students perceptual acuity, stimulate students creativity and imagination, and cultivate students cooperative spirit and logical deductive ability; After this training program, to explore the influence for students sensibility, creativity, and learning experience. This study focuses on the sensibility and imagination in the training program. The sound performance, emotional expression, and limb rhythm is used. The training is carried out in a group cooperative and independent performance mode. Before and after the Affective Embodiment Creativity Training program, the Torrance Tests of Creative Thinking (TTCT) were used to collect pre- and post-test data. The researcher evaluated the impact of the Affective Embodiment Creativity Training program on creativity of these students. The researchers analyzed several data, including classroom observation reports and the training program feedback from students. Furthermore, all the evidence suggested that the experimental group significantly outperformed the control group in all aspects of perceptual acumen and creativity. The research results show that this teaching and training program effectively enhances students perceptual acumen and creativity, and expresses a positive attitude in students feedback after class. It believes that this teaching training method can effectively enhance emotional acuity, creative thinking and imagination, in emotion. Both the aspects of expression and the accuracy of the communication can bring positive results.

Idea Recognition: Revealing Fashion Entrepreneurs Start Up Process

*Lizhu Y. Davis

Associate Professor, Fashion Merchandising, Department of Marketing & Logistics,
Craig School of Business, USA

Corresponding Email: lidavis@csufresno.edu

Keywords: Fashion Entrepreneur, Idea Recognition

Entrepreneurship is essential for the fashion industry. Besides creating employment opportunities, fashion entrepreneurs drive innovative product development processes and business models (Zhao and Ha-Brookshire, 2014). Yet, limited studies focus on understanding the characteristics of fashion entrepreneurs and their start up processes. Therefore, this study aimed to understand fashion entrepreneurs and how they recognize their business ideas. For the purpose of this study, personal interviews with open-ended questions were conducted over a 2- month period. Thirteen fashion entrepreneurs were recruited through purposive sampling technique. Interviews were conducted either in person at locations that were convenient for the interviewees or through online conference platforms. The interviews were recorded with agreement from the interviewees. Then the audio data was transcribed to text for data analysis. Content analysis method was used for data analysis. The data reveal that there are two types of fashion entrepreneurs: intentional fashion entrepreneurs and accidental fashion entrepreneurs. Some Intentional fashion entrepreneurs had a desire to own their own business. Therefore, they actively sought and planed for the business opportunities. Others recognized the opportunity through work experiences. These accidental fashion entrepreneurs never thought about owning a business. Some of them are very creative; they started with a hobby for personal enjoyment. Others recognized the opportunity through life incidents. Those tend to have business experiences from other industries. The findings of the study reveal that different types of fashion entrepreneurs recognize business opportunities differently. The findings can help fashion educators provide more effective fashion entrepreneurship education.

The Geographic Analysis on the Early Adopters of a New Technology- The Case of Mobile Payment in Taiwan

*Chih Cheng Chen

Department of Information Management Yuan Ze University, Taiwan

Corresponding Email: chihcheng@saturn.yzu.edu.tw

Keywords: TV shows, Storytelling, Acculturation, and Country images.

Most of the conventional analysis on the pattern of adopters for a new technology are based on the model named as technology adoption lifecycle or the innovation diffusion, which describes the adoption or acceptance pattern of a new product or innovation, according to the demographic and psychological characteristics of defined adopter groups. One of the groups is the early adopter. This term is originated from Rogers (1962) and is referred to the early customer of a given company, product, or technology. Typically a customer in this group are considered to provide considerable feedback to help the vendor refine its future product releases, as well as the associated means of distribution, service, and support and furtherly expand the adoption rate of the new product/service/technology. Thus to know the characteristics for the customers in this group is very important for the vendor/innovator of a new technology. However, most of the past studies focusing on this group are concerned with the demographic and psychological characteristics. Rarely research this group from the perspective of geographic view. Thus, to bridge this literature gap by adding the geographic characteristics for the analysis on this group is the main purpose of this study. In this study, we will use the original data, named as Digital Opportunity Survey for Individuals and Households in 2017, and collected by Taiwans National Development Council. This survey has held every year from 2002 and some of the questionnaires adjusted according to the new environment of digital environment in Taiwan. Take for examples, the Act Governing Electronic Payment Institutions began to implement from May in 2015, which is considered as the law to help the development of Taiwans mobile payment. Thus, in 2017, this survey began to add a question for the adoption of mobile payment in questionnaires. According to the report of this survey in 2017, the adopt rates of mobile payment in Taiwan is 10.1these observations could be considered as the early adopters of mobile payment in Taiwan. We will firstly analyze the geographic locations of these observations to explore the relationship between the spatial distribution of Taiwans early adopters of mobile payment and the social-economic characteristics of the locations. Secondly, we will employment these characteristics into the logit/probit



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model to investigate the statistical significance of these regional factors as well as the personal attributes of observations.

The Forecasting on the Price of Bitcoin with the Application of ARIMA model in Machine Learning

*Lee Yao Xian

Yuan Ze University, Taiwan

Corresponding Email: y2k702631393@gmail.com

Keywords: Machine Learning, Bitcoins Price, ARIMA, Price Prediction, Price Forecasting

Since the birth of Bitcoin in 2009, the market for virtual currencies has been built and expanded continuously. Accompanying with the rise of this market, it also attracts people to invest the activity to mine the virtual currencies. As a result, after successfully attract the eyes of investors, a lot of real currencies have been threw into this market and push the price of Bitcoin, the earliest mined and the most known virtual currency, to reach the historical high on December 16, 2017. At that time, the price per Bitcoin was list as \$19,665.39. However, the price of this virtual currency began to fall in January 2018. Recently, its price is swinging around \$3,000 to \$4,000, about 15-20% from its peak. Now that the price of virtual currencies, such as the Bitcoin, fluctuate frequently, their predictions are important because those can help the investors to make the correct investing decision. In this study, we will apply method of machine learning with the incorporation of the autoregressive integrated moving average model to predict the trend of price for Bitcoin. The data we use in this study is collected from CoinGeco within the period of 2013 to 2018. By executing the EACF package of R, the best combination on legged time periods of Bitcoins price for the autoregressive and moving averages model are derived. Then we apply this best fitted model to forecast the price of Bitcoin, including the intra-sample and out-of-sample forecasts. The experimental results show that the ARIMA model derived in this study is fair accurate on the prediction of Bitcoins price because the percentage of long-term forecasting error intra the sample is 1.7% only, whilst the out-of-sample prediction error is 2% in 7 days and 5.07% in 14 days. Most importantly, our predictions indicate that the price of Bitcoin will gradually decrease in the future.

Residential versus Organizational Preferences toward Logo of Property Developer in Thailand

*Mittheera Leelayudthyothin

King Mongkuts Institute of Technology Ladkrabang, Thailand

Corresponding Email: chihcheng@saturn.yzu.edu.tw

Keywords: Logo Design, Logo Preference, Brand Personality, Property Developer.

One basic strategy that most organizations use in differentiating itself from others is brand identification which normally expresses in the form of logo. It is predominantly required in all kinds of business, especially the corporation that pays high attention on its identity and image particularly real-estate developer. The main objective of this research was to compare the preferences between residents and staff members of the company toward logo design elements consisting of type font, graphic, and color. The most recent annual sales of property development business in Thailand were reviewed, and Pruksa brand was selected as our case study due to its top selling margin. Through questionnaire interview, samples of two groups including: 1) 150 residents of Pruksas low-rise and high-rise residential properties in Bangkok and 2) 40 Pruksas staff members were randomly selected to rate three types of logo preference in terms of uniqueness, recognition, and aesthetics. The preferences concerning logos main elements and the attitudes toward brand personality between the aforementioned two groups were analyzed by T-Test and Chi-square statistics, respectively. Guidelines for real-estate logo design aiming to represent brand personalities sophistication, excitement, security, and simplicity while meets their clients preferences at the same time will be proposed.

The Study of Business Model for Cross-border E-commerce

*Chen-I Huanag

Yuda University, Taiwan

Corresponding Email: cih@ydu.edu.tw

Keywords: Business Model, Cross-border, E-commerce, Community Marketing.

The purpose of this study is to explore the business model for a cross-border watch company in the virtual market. The virtual market in this research focuses on mobile App devices and social communities. In the e-commerce market, the company uses community marketing and cross-border e-commerce to enhance its merchandise sales. In-depth interviews are applied to ecommerce platform experts. The findings suggest that the successful business model include a clear brand positioning, exposure to social media channels, enhance of the webpage experience and optimization of global cross-border e-commerce purchasing platform.

Relationships among Expectation, Satisfaction and Revisit intention of Tourist: A Case Study of Outbound Vietnam Tourism

*LUONG THE BAO

I-Shou University, Taiwan

Corresponding Email: luongthebao93@gmail.com

Keywords: Expectation, Satisfaction, Revisit intention, Outbound Vietnamese tourists

This research focuses on the relationship among expectation, satisfaction and revisit intention of outbound Vietnamese tourists. The research study sets with the individual unit of analysis. Data was collected from 256 outbound Vietnamese tourists who are living and working at Ho Chi Minh City, Vietnam. Tourist guides and agency staffs have helped in the implementation of surveys. The survey questions are composed of 4 parts, which are demographic, tourist behavior, expectation, satisfaction and revisit intention. The research instrument is a questionnaire to measure the perception of respondents through 5 Likert Scale, as well as testing the research model by using the software of SPSS. Study results revealed that the outbound Vietnamese tourists expectation is significantly predicted their satisfaction. The outbound Vietnamese tourists satisfaction is significantly predicted their revisit intention. The outbound Vietnamese tourists expectation is also significantly predicted their revisit intention. Based on findings, some suggestions for tour operators, travel agencies, the Vietnamese Government and local Governments were made.

Design and Pre-implementation Assessment Survey of an Online-based Information System for Abdou Moumouni University of Niger

* Assao Neino Alu

Graduate School of Engineering and Science, University of the Ryukyus, Okinawa
Japan

Corresponding Email: alouassao@gmail.com

Keywords: Niger, Abdou Moumouni University, Information System, Mobile Banking System, Online Registration System.

This work proposes to digitize the Abdou Moumouni University of Niger information system based on the socioeconomical situation of students and the challenges they face each time during the manual registration process as well as to enable the University in manipulating data records easily. The project targets to develop a complete web-based Information system with students e-registration process. It also uses the latest local available transaction systems which is the Mobile Banking system through mobile network operators in parallel with the banking system to enable students do their registration exercise from their resident, town or country at appropriate time without spending lot of time and resources. Furthermore, the work was based and followed by a survey which evaluate and appreciate the impact by the students for its implementation. The results obtain from the survey show that if implemented, the system will positively impact in time and resources management also will creates a business environment opportunity in which all involved actors (University, students & corporates) will be benefiting from.

International Tourists Decision Making of Choosing Vietnam as a Travel Destination

*Jiin Ling Lin

I-Shou University, Taiwan

Corresponding Email: jinlingl@isu.edu.tw

Keywords: Destination Image, Overall Satisfaction, Revisit intention, Perceived risks.

Tourism in Vietnam shows the fastest growth record in overseas arrivals by a rise of 29.1% from 2016 to 2017 in South-East regions. Such sharp growth may derive from its tourism policies such as Decision 1861. In 2017, the industries of Travel and Tourism have contributions to employment, including direct and indirect tourism jobs (World Travel and Tourism Council, 2019). This brought attention to investigate the international tourists travel decision making while choosing Southeast Asia as travel destination. Previous studies have shown that images of a destination have an influence on tourists satisfaction and their after-sales behavior (Hui, Wan & Ho, 2007). Besides image of destination, tourist decision making can be affected by perceived risks (Kim & Seo, 2018; Lepp, & Gibson, 2003). According to Saechau and Yu (2015), perceived risks of tourists differed among destination selection. Hence, this study is to examine the relationships among destination image, tourists overall satisfaction and their revisit intention, and the mediating effect of perceived risks on the relationship between destination image and revisit intention. Data was collected onsite from 293 international tourists leaving Hanoi at Department Hall of Noi Bai International Airport. The results revealed that destination image and satisfaction significantly predict tourists revisit intention. In addition, tourists perceived risks significantly mediate destination image on their revisit intention. The findings also verified there is a difference among segments in each demographic group (gender, marital statuses, age groups, education levels, occupations and geographic origins). Discussion and recommendation were presented in the end.

Impact of Learning Method on Entrepreneurial Intention and Entrepreneurial Education of Undergraduate Students: A Case Study of a Private University in Thailand

*Chanita Jiratchot

Assumption University, Thailand

Corresponding Email: chanitasry@msme.au.edu

Keywords: Entrepreneurial intention, Entrepreneurial education, Learning method

Entrepreneurial intention has gained more attention from researchers due to its impact on economic growth, economic development and unemployment rate of the country. Entrepreneur in Thailand increases continuously by the influence of environmental factors that foster and cultivate people to become entrepreneurs. One of the environmental factors is entrepreneurial education. Undergraduate students are the new generations of workforce who choose their career paths in the future and their decisions are essential to entrepreneurship in Thailand. The objectives of this study were to investigate the relationship between entrepreneurial education and entrepreneurial intention of undergraduate students. Moreover, the impact of learning method was examined in this study. Questionnaire survey was conducted and survey data were obtained from 420 undergraduate students of a private university in Thailand. The measurement of entrepreneurial education and entrepreneurial intention were adopted from the previous researches and questions of different learning methods together with demographic profiles were included in the questionnaire survey. Data were analyzed by using Statistical Analysis Software or SAS program with the employment of simple regression analysis and independent sample t-test to test the proposed hypotheses. The result indicated that entrepreneurial intention of undergraduate students was significantly affected by entrepreneurial education. Additionally, impact of learning method and demographic profiles on entrepreneurial education were found but the impact on entrepreneurial intention were not found in this study.



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TRACK C

ENGINEERING, TECHNOLOGY & APPLIED SCIENCES

Metal Sheets Scratch Detection System Based On FPGA Image Processing

¹Ruei-Chang Lu , ²Rui-Tang Huang, ³ Miao Ou Yang

^{1,2,3}Dept. of Electronic Engineering, National I-Lan University, I-Lan, 260, Taiwan,
R.O.C.

Corresponding Email: rclu@ems.niu.edu.tw

Keywords: FPGA, Sobel, Morphology, Image processing

The history of human industrial development, from the beginning of the industrial revolution's steam to replace human and animal power, then to the power-driven modern industry and then to the future of the unmanned factories, is basically a process of continuously improving the degree of automation. In the automation industry, automated product testing is also an important part of it. The high difficulty of automated product testing lies in the need to address the many possible defects in production. Therefore, the algorithm for automated detection is more complicated, resulting in higher hardware requirements for the device and higher cost. This paper proposes a scratch detection system based on field programmable gate array (FPGA) for metal sheets. This system first photographing the image of the metal sheet under different light source intensity and incident angle conditions. Then the image is gray-scaled and is performed by Sobel edge detection image processing. The processed image is then partitioned to define effective and ineffective areas. Base on the light conditions of the picture, the system will assign various filter and binarization thresholds to differentiate noise and shading. Whether there are abnormal lines or spots in the effective area is used to achieve the purpose of automatic detection. In the back of the paper is the result of experimental tests on several types of scratches, as well as statistics on experimental data such as correctness and processing time. We present a low-cost and fast processing detection system based on its pure hardware architecture and simple algorithms.

An Automatic Tree Rings Detection Platform based on FPGA

^{1*}Miao Ou Yang, ²Ruei-Chang Lu ³Rui-Tang Huang

^{1,2,3}Dept. of Electronic Engineering-National I-Lan University I-Lan, 260, Taiwan,
R.O.C

Corresponding Email: benson50217@gmail.com

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In recent years, protection of trees has received great attention everywhere. The government has set a number of bills to conserve trees. Trees can regulate climate, clean air, soil, and water conservation, and alleviate the greenhouse effect. In addition, information about the surrounding environment is obtained by observing trees. Many researchers analyze the growth status, climate and ecological changes of forests in the region by observing the tree rings. Although the tree rings can provide a lot of information, the number of tree rings are huge, and the density of tree rings is various. Hence the researchers are not easy to get the information they need. This paper designs and proposes an Automatic Tree Rings Detection Platform based on FPGA. The FPGA have the advantages of flexibility and integration. Using the advantages of FPGA integration, the charge-coupled device camera and image processing module are integrated to design an automatic detection platform. Researchers in forestry, ecology, and botany can use pre-processed cross-sections of trees as test samples and place them on the automated detection platforms. The charge-coupled device camera captures the image of the test sample and converts the image into an RGB color image, allowing researchers to view the cross-section of the tree over the screen. In addition, the image processing module includes the functions of low-pass filtering, edge detection, binarization and mathematical morphology. The image processing module converts RGB into a grayscale image. Grayscale images will be analyzed. Calculate the number of tree rings based on the analysis results and show the distribution of the tree rings. Researchers can observe the color change, shape, density and quantity of the tree rings based on the analysis results, and evaluation the age of trees and the climate change in the region.

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