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Part I Conference Schedule

Time: November 28 to 30, 2016

Location: International Asia-Pacific Convention Center Sanya, Sanya, China

(三亚亚太国际会议中心暨三亚海航度假酒店)

Date	Time	Lobby	
November 28	14:00-18:00	Registration	
Date	Time		
November 29	08:30-12:00	Invited Speech Session 1: Laser and Optoelectronics & Semiconductor Physics and Devices Prof. Xuewen Shu, Prof. Yong-gang Zhang, Prof. Jian Wang, Prof. Kun Yang&Prof. W. J. Fan Chair: Prof. Xuewen Shu Group Photo & Coffee Break :10:30-10:50	Invited Speech Session & Technical Session 1 : Economy, Management and Service Science (1) Prof. Hui-Ming Wee Chair: Prof. Hui-Ming Wee Group Photo & Coffee Break :10:30-10:50
	12:00-13:30	Lunch1st Floor, Pacific Cafe (太平洋咖啡厅)	
	13:30-18:00	Invited Speech Session 2: Artificial Intelligence& Computer Science Prof. Jixin Ma, Prof. Yizhou Yu, Prof. Chih-Min Lin, Dr. EvgenyPuchkov Chair: Prof. Jixin Ma Group Photo & Coffee Break :16:00-16:20 Technical Session 3	Technical Session 2 : Economy, Management and Service Science (2)
	18:00-19:30	Dinner1st Floor, Pacific Cafe (太平洋咖啡厅)	
Date	Time	TBD	
November 30	08:30-12:00	Technical Session 4: Technical Session 2: Computer Science and Applied Physics Chair: TBD Group Photo & Coffee Break :10:30-10:50	
	12:00-13:30	Lunch1st Floor, Pacific Cafe (太平洋咖啡厅)	

Part II Invited Speech

Invited Speech Session 1:

Laser and Optoelectronics & Semiconductor Physics and Devices

Invited Speech: Optical fiber gratings and their applications in sensors and lasers

Speaker: Prof. Xuewen Shu,
Huazhong University of Science and Technology, China

Time: 08:30-09:10, Tuesday, November 29, 2016

Location: 3rd Floor, Macau Room (澳门厅), International Asia-Pacific Convention Center Sanya, Sanya, China



Abstract

Optical fiber gratings are in-fiber periodic or quasi-periodic refractive index structures. They can be fabricated with various laser sources such as UV lasers and femtosecond lasers. Optical fiber gratings may be classified into short-period gratings (or fiber Bragg gratings, FBG) and long-period gratings (LPG). Optical fiber gratings have attracted considerable research interests in past two decades since they have important applications in wide research areas such as optical communications, lasers and sensors. In this paper, we will review our past and recent research work on fiber lasers and sensors that employ optical fiber gratings.

Invited Speech: InP-based antimony-free lasers and photodetectors in 2-3 μm band

Speaker: Prof. Yong-gang Zhang,
Shanghai Institute of Microsystem and Information Technology, Chinese
Academy of Sciences

Time: 09:10-09:50, Tuesday, November 29, 2016

Location: 3rd Floor, Macau Room (澳门厅), International Asia-Pacific
Convention Center Sanya, Sanya, China

Abstract

Semiconductor lasers and photodetectors (PDs) in 2-3 μm , part of near-infrared or short-wave infrared wavelength range, have aroused increasing interests for the applications on environmental monitoring, medical diagnostics, image sensing, lidar, and night or fog penetrate vision, etc. In addition to antimony containing materials, the mature epitaxial growth and processing technology, as well as much higher thermal conductance and better properties of InP substrate versus GaSb, makes antimony-free materials mainly the ternary $\text{In}_x\text{Ga}_{1-x}\text{As}$ a good candidate to cover this wavelength range. The quantum well lasers and PDs applying InP-lattice-matched InGaAs or related InGaAsP and InAlGaAs quaternary have been well developed for telecom lasers and PDs with wavelength shorter than 1.7 μm . For the ternary $\text{In}_x\text{Ga}_{1-x}\text{As}$ at x from 0.53 to 1, the bandgap could be varied from 0.74 to 0.36 eV at 300 K, corresponding to bandgap wavelength of 1.7 to 3.4 μm contain 2-3 μm . For the $\text{In}_x\text{Ga}_{1-x}\text{As}$ QW lasers, the emission wavelength can be tailored to 2-3 μm range by increasing the indium content in the QWs, whereas significant strain is introduced into the quantum QWs, and confinement of electrons and photons become poor. Therefore, the design of structure, control of material quality and suppression of dislocations become the main concern. To shift the response of $\text{In}_x\text{Ga}_{1-x}\text{As}$ photodetectors to longer wavelength, the indium content in the InGaAs alloy should also be increased, a quite large lattice mismatch between the InGaAs layer and InP substrate need to be relaxed through suitable buffer structure.

In this presentation, our efforts on InP-based antimony-free QW lasers and $\text{In}_x\text{Ga}_{1-x}\text{As}$ PDs will be reviewed. For the lasers, novel triangular shape QW was used to increase the lasing wavelength while restricting the strain. Digital alloy technology was used to form the triangular QW during the MBE growth. The lasers with continuous wave lasing from 2.0 to 2.4 μm at room temperature have been achieved [1-2]. To extend the emission wavelength longer, metamorphic scheme was employed. An $\text{In}_{0.8}\text{Al}_{0.2}\text{As}$ template was grown on InP substrate to produce a virtual substrate with larger lattice constant than InP, and then InAs QWs were grown. Lasers with lasing wavelength up to 2.7-2.9 μm have been demonstrated [3-4]. The cutoff wavelengths of $\text{In}_x\text{Ga}_{1-x}\text{As}$ PDs have been shifted from 1.7 μm up to 2.9 μm [5], and FPA have been developed for space sensing applications, etc. In those PDs and FPAs InAlAs buffer and cap layers with wider bandgap were adopted, and the n-on-p configuration was applied [6]. The dark current of those PDs have been suppressed effectively by using superlattice electron barriers in the absorption layer [7].

References:

- [1] Y. Y. Cao, Y. G. Zhang, Y. Gu et al. IEEE Photon. Technol. Lett., 26, 571, (2014)
- [2] Y. Gu, Y. G. Zhang, Y. Y. Cao et al. Appl. Phys. Express, 7, 032701, (2014)
- [3] Y. Y. Cao, Y. G. Zhang, Y. Gu et al. Appl. Phys. Lett., 102, 201111, (2013)
- [4] Y. Gu, Y. G. Zhang, Y. J. Ma et al. Appl. Phys. Lett., 106, 121102, (2015)
- [5] Y. G. Zhang, Y. Gu, book chapter in 《Advances in Photodiodes》, ISBN: 978-953-307-163-3, (2011).
- [6] Y. G. Zhang, Y. Gu, K. Wang et al. Semicon. Sci. Technol., 23, 125029, (2008)
- [7] Y. Gu, L. Zhou, Y. G. Zhang et al. Appl. Phys. Express., 8, 022202, (2015)



Invited Speech: On-Chip Optical Data Processing on a Silicon Platform

Speaker: Prof. Jian Wang,
Huazhong University of Science and Technology, China

Time: 09:50-10:30, Tuesday, November 29, 2016

Location: 3rd Floor, Macau Room (澳门厅), International Asia-Pacific Convention Center Sanya, Sanya, China



Abstract

In this talk, we review our recent research progress in on-chip optical data processing on a silicon platform. By exploiting the linear and nonlinear effects in the designed and fabricated silicon nanophotonic devices, we demonstrate grooming on-chip optical data processing functions such as signaling, demultiplexing, wavelength conversion, data exchange, optical computing, etc.

Invited Speech: Interplay of Topology and Geometry in Fractional Quantum Hall Liquids

Speaker: Prof. Kun Yang, Florida State University, USA

Time: 10:50-11:30, Tuesday, November 29, 2016

Location: 3rd Floor, Macau Room (澳门厅), International Asia-Pacific Convention Center Sanya, Sanya, China



Abstract

Fractional Quantum Hall Liquids (FQHL), which are realized in high quality semiconductor-based devices, are the ultimate strongly correlated electron systems, and the birth place of topological phase of matter. Early theoretical work has emphasized the universal or topological aspects of quantum Hall physics. More recently it has become increasingly clear that there is very interesting bulk dynamics in FQHL, associated with an internal geometrical degree of freedom, or metric. The appropriate quantum theory of this internal dynamics is thus expected to take the form of a “quantum gravity”, whose elementary excitations are spin-2 gravitons. After briefly reviewing the topological aspect of FQHL, I will discuss in this talk how to couple and probe the presence of this internal geometrical degree of freedom experimentally in the static limit, and detect the graviton excitation in a spectroscopic measurement.

Invited Speech:Electronic structure and optical properties of dilute nitride bismide semiconductors

Speaker:Prof. W. J. Fan,
Nanyang Technological University, Singapore

Time:11:30-12:10, Tuesday, November 29, 2016

Location: 3rd Floor, Macau Room 澳门厅), International Asia-Pacific Convention Center Sanya, Sanya, China



Abstract

In this talk, we will review our recent work on the electronic structure and optical properties of GaAsNBi semiconductor quantum wells and quantum dots. The calculation is based on the 16-band k.p method. Band anti-crossing (BAC) and valence band BAC will be applied to 8-band k.p Hamiltonian to form the 16-band k.p method. Strain effect is taken into consideration in the model. The band structure and optical gain spectra will be calculated and discussed.

Invited Speech Session 2:

Artificial Intelligence & Computer Science

Invited Speech: Temporal Aspects in Pattern Recognition

Speaker: Prof. Jixin Ma,
University of Greenwich, UK

Time: 14:00-14:40, Tuesday, November 29, 2016

Location: 3rd Floor, Macau Room (澳门厅), International Asia-Pacific Convention Center Sanya, Sanya, China



Abstract

Pattern recognition aims at the operation and design of technologies to pick up meaningful patterns in data. In conventional pattern recognition systems, various patterns are usually represented as isolated collections of data while the temporal relationships between distinct patterns are neglected in most approaches. Generally speaking, temporal representation and reasoning is essential for many computer-based systems. In particular, an appropriate representation and reasoning for temporal knowledge seems necessary for recognizing pattern histories that usually involve rich internal temporal aspects, rather than just distinct patterns. Recognizing pattern histories actually plays an important role in solving problems including explanation/diagnosis, prediction/forecast, planning/scheduling, process management, and history reconstruction, etc. For instance, in the area of medical information systems, a patient's medical history is obviously very important. In fact, to prescribe the right treatment, the doctor needs to know not only the patient's current status, but also his/her previous health records. Similarly, in the weather forecasting, without a good understanding of climate phenomena based on past observations, the weather expert cannot make good predictions of the future. The purpose of this speech is to: (a) motivate and explain a topic of emerging importance in Artificial Intelligence; (b) provide an overview on some fundamental issues with respects to temporal representation and reasoning; (c) present a framework for representing and recognizing pattern histories with rich internal temporal aspects.

Invited Speech: Visual Intelligence Based on Deep Learning

Speaker: Prof. Yizhou Yu,

The University of Hong Kong, Hong Kong (China)

Time: 14:40-15:20, Tuesday, November 29, 2016

Location: 3rd Floor, Macau Room 澳门厅), International Asia-Pacific Convention Center Sanya, Sanya, China



Abstract

Deep learning is a powerful machine learning paradigm that involves deep neural network architectures, and is capable of extracting high-level representations from multi-dimensional sensory data. Such high-level representations are essential for many intelligence related tasks, including visual recognition, speech perception, and language understanding. In this talk, I first give an overview of deep learning and its applications in computer vision and visual perception. Then I present one of the deep learning projects for visual intelligence carried out in my research group. This project addresses scene labeling, which is also known as semantic scene segmentation. It is one of the most fundamental problems in computer vision, and refers to associating every pixel in an image with a semantic object category label, such as `building`, `car`, and `table`. High-quality scene labeling can be beneficial to many intelligent tasks, including robot task planning, pose estimation, context-based image retrieval, and automatic photo adjustment. Our project focuses on semantic labeling of RGB-D scenes, and generates pixel-wise and fine-grained label maps from simultaneously sensed photometric (RGB) and depth channels. Specifically, we tackle this problem by i) developing a novel Long Short-Term Memorized Context Fusion (LSTM-CF) model that captures image contexts from a global perspective and deeply fuses contextual information from multiple sources (i.e. photometric and depth channels), and ii) incorporating this model into deep convolutional neural networks (CNNs) for end-to-end training. It has been demonstrated on the large-scale SUNRGBD benchmark and the canonical NYUDv2 benchmark that our method outperforms existing state-of-the-art methods. In addition, it has been found that our scene labeling results can be leveraged to improve the ground-truth annotations of newly captured RGB-D images in the SUNRGBD dataset.

Invited Speech: Cerebellar Model Neural Networks and their Applications on Control, Classification and Signal Processing

Speaker: Prof. Chih-Min Lin, YuanZe University, Chinese Taipei

Time: 15:20-16:00, Tuesday, November 29, 2016

Location: 3rd Floor, Macau Room (澳门厅), International Asia-Pacific Convention Center Sanya, Sanya, China



Abstract

Based on biological prototype of human brain and improved understanding of the functionality of the neurons and the pattern of their interconnections in the brain, a theoretical model used to explain the information-processing characteristics of the cerebellum was developed independently by Marr (1969) and Albus (1971). Cerebellar model neural network (CMNN) or called as cerebellar model articulation controller (CMAC) was first proposed by Albus in 1974. CMNN is a learning structure that imitates the organization and functionality of the cerebellum of the human brain. That model revealed the structure and functionality of the various cells and fibers in the cerebellum. The core of CMNN is an associative memory which has the ability to approach complex nonlinear functions. CMNN takes advantage of the input-redundancy by using distributed storage and can learn nonlinear functions extremely quickly due to the on-line adjustment of its system parameters. CMNN is classified as a non-fully connected perceptron-like associative memory network with overlapping receptive-fields. It has good generalization capability and fast learning property and is suitable for a lot of applications. This speech will introduce several new CMNN-based adaptive learning systems proposed by me; these systems combine the advantages of CMNN identification, adaptive learning, control technique, signal processing and image classification. In these systems, the on-line parameter training methodologies, using the Lyapunov theorem, are proposed to guarantee the stability and convergence of these systems. Moreover, the applications of these systems in nonlinear systems control, biped robot control, signal processing of communication system, and computer-aided diagnosis of breast nodules are demonstrated.

Invited Speech:Image analysis in microbiology

Speaker:Dr. Evgeny Puchkov, Skryabin Institute of Biochemistry and Physiology of Microorganisms, Russia

Time:16:20-17:00, Tuesday, November 29, 2016

Location: 3rd Floor, Macau Room 澳门厅), International Asia-Pacific Convention Center Sanya, Sanya, China



Abstract

This presentation is a review focused on using computer image analysis as a means of objective and quantitative characterizing optical images of the macroscopic (e.g. microbial colonies) and the microscopic (e.g. single cell) objects in the microbiological research. This is the way of making many visual inspection assays more objective and less time and labor consuming. Also, it can provide new visually inaccessible information on relation between some optical parameters and various biological features of the microbial cultures. Of special interest is application of image analysis in fluorescence microscopy as it opens new ways of using fluorescence based methodology for single microbial cell studies. Examples of using image analysis in the studies of both the macroscopic and the microscopic microbiological objects are presented and discussed.

Invited Speech Session & Technical Session 2 :

Economy, Management and Service Science

Invited Speech: Sustainable supply chains under carbon cap scheme

Speaker: Prof. Hui-Ming Wee

Chung Yuan Christian University, Chinese Taipei

Time: 08:30-09:10, Tuesday, November 29, 2016

Location: 3rd Floor, Tokyo Room (东京厅), International Asia-Pacific Convention Center Sanya, Sanya, China



Abstract

Increasing environmental concerns together with stricter legislations are forcing industries to take a fresh look at the impact of their supply chain especially its logistics on the environment. This talk discusses the trade-off between total transportation cost and total carbon emission in freight consolidation and containerization problem. The methodology used is a case based approach where we determine the types and quantities of both container and truck used to deliver the goods from origin hub (Kaohsiung, Taiwan) to destination hub (Jakarta, Indonesia) in order to balance cost and emission. We present two scenarios: original policy and carbon cap scenario. The performance of the proposed model for each scenario is evaluated and compared. Based on the results for each scenario, the shipment consolidation and containerization strategy considering carbon cap scheme gives a better result in terms of balancing total transportation cost and total carbon emission compared with the original policy.

Part III Technical Sessions

Technical Session 1: Economy, Management and Service Science (1)

Session Chair: Hui-Ming Wee

Chung Yuan Christian University, Chinese Taipei

3rd Floor, Tokyo Room(东京厅),

09:10–18:00, Tuesday, November 29, 2016

ID	Paper Title	Author	Affiliation
MIE2016_90001	User Acceptance of Personalized and Context-specific Online Advertising	SaraDeniseRu hrberg	Heinrich-Heine-University
MIE2016_90002	Facebook in Vietnam: Uses, Gratifications & Narcissism	Brian McCauley	RMIT University Vietnam
SDEE2016_90004	The proposed South African carbon tax as environmental fiscal reform measure and facilitating factor for sustainable development	Michelle Barnard	North West University
SDEE2016_90007	Bioeconomy: the challenge in the management of natural resources in the 21st century	Alexandra Leitao	Universidade Católica Portuguesa
SDEE2016_90005	Global crisis – transnational ecological management as a building block in regional and global environmental governance	Niel (Willem Daniël) Lubbe	North West University
AFM2016_90004	Mutual fund flows and seasonalities in stock returns	John Lee	University of Auckland
AFM2016_90006	The limits of Balanced Scorecard	Ivo Hristov	University Of Rome Tor Vergata Department of Management and Law
AFM2016_90002	Perception versus reality: Do Chinese firms carry elevated risk of accounting fraud?	Zhefengliu	Brock University
AFM2016_90003	Executive Compensation and Compensation Risk: Evidence from Technology Firms	Zhongzhi He	Brock University
AFM2016_90008	Who Knows What and When? The Information Production in MLU-IPOs	Richard Yiu-Ming Chung	Griffith University

Technical Session 2: Economy, Management and Service Science (2)

Session Chair:TBD 14:00–17:30, Tuesday, November 29, 2016

ID	Paper Title	Author	Affiliation
PMFS2016_90002	Improvement of the relation between existing techniques of product and food protection and drugs safety managemen	Ivan Spirydonau	Tor Vergata' University of Rome
PMFS2016_90004	Implementing Total Quality Management in Education: Compatibility and Challenges	Sohel Zaman	United International University
LSCM2016_90002	Application of Artificial Neuron Network in Analysis of Railway Delays	Jia Hu	University Duisburg-Essen
LSCM2016_09002	Multi-Objectives Productivity Improvement In Printing Industry Using Lean	Chi On Chan	Hong Kong Shue Yan University
LSCM2016_09004	Demand Forecast on Container Inventory in Shipping Lines: Focused on China Major Port	KilSoo Jung	Incheon National University
WEC2016_90002	The influence of macroeconomic environment on Australian household debt: An application of Dynamic OLS	XianmingMeng	University of New England
HREM2016_90002	Tertiary Teachers Teaching Professional for Adjust Industry 4.0	Chou Chun-Mei	National Yunlin University of Science and Technology
PQM2016_90001	Contractual governance effects on cooperation in construction projects management	QuanjiZhuojun	Tianjin university
SDEE2016_90010	Drivers of sustainable development of Russian cities in the modern economic conditions	Olga Romanchenko	PLEKHANOV Russian University of Economics
DIKM2016_90000	Performance Analysis of Cognitive Hybrid Satellite Terrestrial Relay Networks	Kang An	Nanjing Telecommunication Technology Institute

Technical Session 3: Artificial Intelligence, Robots and Automation

Session Chair: Prof. Jixin Ma

University of Greenwich, UK

3rd Floor, Macau Room (澳门厅) Tuesday, November 29, 2016

ID	Paper Title	Author	Affiliation
ARAT2016_90001	Analysis of Design Directions for Ground Control Station (GCS)	Yongjin Kwon	Ajou University
ARAT2016_90003	Technical Analysis of VTOL UAV	Seunghee Yu	Ajou University
AIR2016_10006	Intelligent diagnostics of the responsible units of the vehicles in the conditions of Arctic and the Far North	Yuri Kabaldin	Nizhny Novgorod State Technical University
AIDM2016_90000	Measuring Musical Rhythm Similarity: Further Experiments with the Many-to-Many Minimum-Weight Matching Distance	Godfried Toussaint	New York University Abu Dhabi

Technical Session 4: Computer Science and Applied Physics

Session Chair: TBD

TBD

澳门厅, 08:30-12:00, Wednesday, November 30, 2016

ID	Paper Title	Author	Affiliation
CIACV2016_90001	An Interactive Learning Platform of Geographic Information using Automatic Motion Detection and Localization	Chen, Chun-Chi	Chung-Yuan Christian University
CIACV2016_90005	Integrated Fire Detection and Alarm System Using Raspberry Pi	Lin, Cheng-Yu	Chung-Yuan Christian University
ICRSTA2016_90001	Features of behavior and use of Total Electron Content according to Hainan station data	Olga Maltseva	Institute for Physics Southern Federal University
ICRSTA2016_90006	Aerosol decreases in recent years over the Sichuan Basin, Southwest China: A perspective from MODIS observations	Yao Liao	Institute of Guizhou mountain environment and climate research
ICRSTA2016_90005	UAV remote sensing for estimating the growth parameters of white radish and napa cabbage using multi-temporal aerial images and crop surface model	Heesup Yun	Seoul National University
ICRSTA2016_90004	Color-based crop image Segmentation for monitoring the growth status of garlic (<i>Allium sativum</i>) in UAV remote sensing	Sangjin Jeong	Seoul National University

CSGAD2016_90004	Thermal Simulation for Two-Phase Liquid Cooling 3D-ICs	Yu-Min Lee	National Chiao Tung University
CSGAD2016_90004	Thermal Simulation for Two-Phase Liquid Cooling 3D-ICs	Hong-Wen Chiou	National Chiao Tung University & Industrial Technology Research Institute
CSGAD2016_90005	Cooling circuit design and analytical comparisons to maximize cooling efficiency of the injection mold for the drip chamber having multi-cavities	JeongYeon Park	KITECH
ICSPD2016_90008	Simple Spin-Orbit based device for electron polarization	YshaiAvishai	Department of Physics, and the Ilse Katz Center for Nano-Science
ECC2016_90002	Design of Polymorphic Operators for Efficient Synthesis of Multifunctional Circuits	RadekTesar	Brno University of Technology
MLPRIS2016_90004	Blur Image Edge to Enhance Zernike Moments for Object Recognition	Chih-Ying Gwo	ChienHsin University of Science and Technology

Part IV Abstract

Technical Session 1

Paper ID: MIE2016_90001

Title: User Acceptance of Personalized and Context-specific Online Advertising.

Name: Sara Denise Ruhrberg

Affiliation: Heinrich-Heine-University, Düsseldorf, Germany

Email: denise.ruhrberg@hhu.de

Abstract

Over the years, society's character has changed from a pure attention to a contributing model. Due to the internet's evolution over the past decades, the users' role has changed from a passive spectator to an active part of the information process. This can be observed by an increasing demand on interaction possibilities by users. Advertisements which offer user participation for example achieve higher attention rates than static banners. Within this study, user acceptance of personalized and context-specific online advertising has been investigated. For this purpose, users' reactions on personalized advertisements on the Social Network Service (SNS) Facebook in relation to context-specific placed advertisements by Google have been evaluated. Using an online questionnaire, an anonymous survey was conducted, which was aimed at the broad mass of internet users. Key issues were the general perception of online advertisings and the interaction with these. This paper provides insights for advertisers on different generational cohorts' and genders' attitudes towards personalized and context-specific advertising.

Paper ID: MIE2016_90002

Title: Facebook in Vietnam: Uses, Gratifications & Narcissism

Name: Brian McCauley

Affiliation: RMIT University Vietnam

Email: brian.mccauley@rmit.edu.vn

Abstract

The purpose of this study was to create a conceptual framework and to collect some pilot data in order to underpin future research on how the Vietnamese use Facebook in their day-to-day lives. A number of key points were observed in this study, which informed the framework. Firstly, there is a paucity of research on this topic, that Facebook users in Vietnam (population 90 million) rank as some of the heaviest consumers in the world, and Vietnamese cultural traditions and values need to be acknowledged given these differences when compared to other nations and how this might influence Facebook use. Given the studies focus on users, the theory on 'uses and gratifications' was employed in order to understand how Facebook satisfies the needs of its Vietnamese users. An important component in this theory is the way in which Facebook allows posting of material related to the enhancement of the 'self', which has the potential to satisfy ego driven needs in the form of narcissism. However, narcissism and its links with Facebook have only recently been systematically studied in Asian countries, predominately in China. In conclusion, the conceptual framework and analysis of the pilot data produced a number of interrelated constructs (e.g. socializing, social enhancement, entertainment) that provide a baseline or foundation from which a longer-term program of empirical research can be conducted on Facebook use in Vietnam.

Paper ID: SDEE2016_90004

Title: The proposed South African carbon tax as environmental fiscal reform measure and facilitating factor for sustainable development

Name: Michelle Barnard
Affiliation: Potchefstroom
Email: Michelle.Barnard@nwu.ac.za

Abstract

The Constitution of the Republic of the South Africa, 1996 in section 24 enshrines the right to a healthy environment and also places a duty on government to enact legislation aimed at protecting the environment and promote sustainable development. In recent years, the South African Treasury has identified environmental fiscal reform as measure by which both objectives of environmental protection and the promotion of sustainable development can be achieved via economic activities. More specifically, the National Treasury has decided to focus its attention on the implementation of a Carbon Tax as environmental fiscal reform measure. The details of the proposed Carbon Tax are contained in the Draft Bill on Carbon Tax which was published for public comment in 2015. The main aim of the carbon tax is to facilitate environmental protection and sustainable development by altering those economic activities responsible for GHG emissions and climate change. This presentation will introduce carbon tax as an environmental fiscal reform measure and to provide the audience with an overview of the content of the proposed South African carbon tax.

Paper ID: SDEE2016_90007

Title: Bioeconomy: the challenge in the management of natural resources in the 21st century
Name: Alexandra Leitao
Affiliation: Universidade Católica Portuguesa, Católica Porto Business School
Email: apleitao@porto.ucp.pt

Abstract

Countries and regions around the world face a number of economic, environmental and social challenges. Increased demand for energy, primary resources (agricultural, forestry and fishing),

industrial products and services (healthcare in particular) put significant pressure on the sustainability of the ecosystems that support our society.

One option to provide a more sustainable base for the economy would be the transition towards bioeconomy in which the importance of biotechnology and biomass-based production to generate economic output is significantly greater than today. Bioeconomy is considered to encompass all economic activity connected with the utilization of renewable biological resources.

The aim of this paper is to draw attention to the importance of bioeconomy in the management of natural resources in the 21st century, providing many answers to resolve the previous challenges together with environmental preservation. The concept has gained scientific and political attention during the recent years, especially in Europe but also globally.

From the review and analysis of the literature, this paper addresses the emerging bioeconomy, definitions and conceptual bases, and its great potential in different sectors of economic activity and development of new products.

Special emphasis is placed on the case of the European Union. We present the concerns of European authorities at this level and best practices already in force in two Nordic countries that can be regarded as the beginning of a general transition to bioeconomy.

Paper ID: SDEE2016_90005

Title: Global crisis – transnational ecological management as a building block in regional and global environmental governance
Name: Niel (Willem Daniël) Lubbe
Affiliation: North West University
Email: niel.lubbe@nwu.ac.za

Abstract

The Millennium Ecosystem Assessment of 2005 concluded that changes to ecosystems due to human

activities were more rapid in the past 50 years than any other time in history. These changes increase the risk of abrupt and irreversible change to the environment. Globally, and in underdeveloped regions like southern Africa, the main drivers of change are the demand for food, water, and natural resources, causing severe biodiversity loss and leading to changes in ecosystem services. One of the methods that can be employed to combat this rapid decline of biodiversity is to establish and improve connectivity between ecosystems. Addressing this global crisis of biodiversity loss requires a global and holistic solution. Such a holistic solution is however not easy since substantial differences in environmental needs, developmental needs, and political aspirations makes common consensus unlikely – if not impossible. Finding a way forward requires a more geo-specific and focused effort. This submission is based on the fact that smaller regions or sub-regions usually share common developmental and environmental challenges. In such areas, it is thus easier to reach common consensus since there are common denominators to facilitate said consensus.

This paper aims to discuss specific mechanisms that facilitate transnational environmental governance in the Southern African Development Community. These mechanisms are called Transfrontier Conservation Areas (TFCAs). TFCAs are mechanisms through which biodiversity are conserved across sovereign borders. The way in which TFCAs uniquely aim to govern biodiversity influences regional approaches towards biodiversity conservation and in so doing, harmonizes regional approaches to environmental governance. By discussing TFCAs, this paper aims to propose how TFCAs and mechanisms similar to TFCAs can contribute as “building blocks” in constituting harmonized regional environmental governance. The paper will argue that such an approach is required to address the global crises of biodiversity loss.

Paper ID: AFM2016_90004

Title: Mutual fund flows and seasonalities in stock returns

Name: John Lee

Affiliation: University of Auckland

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Abstract

We propose a flow-based explanation for long-standing anomalies in empirical finance – the Sell in May effect and the January effect. We find that the aggregate mutual fund flows exhibit similar seasonal patterns as stock returns. The Sell in May effect becomes insignificant in standard statistical tests after controlling for the impact of mutual fund flows on returns. Flow explains about 54% of the variation in excess returns over the winter months. We also find that flow helps to explain the abnormally high returns of small-cap stocks in January. The Sell in May and the January effect appear to be primarily a retail money effect. Similarly, the well-known co-movement between flow and market return is only present in retail fund flow.

Paper ID: AFM2016_90006

Title: The limits of Balanced Scorecard

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Abstract

Our research focuses on the limits of the Balanced Scorecard. The aim of the work is to provide a basis for in-depth study on the limits of the balanced scorecard. According to Tranfield et al. (2003) we are tackling the topic through a systematic review of the literature. (Denyer & Tranfield, 2009; Lueg & Schäffer, 2010; Rousseau, Manning, & Denyer, 2008; Tranfield, Denyer, & Smart, 2003).

We reviewed articles published in 48 journals, in 3 different subject area of Academic Journal Guide

(ABS) -2015: 27 Accounting journals, 17 General Management and Employment Study journals and 4 Strategy journals. This ensured an academic quality of these articles and for each subject area we chose amongst some of the 3, 4 and 4* journals. The contributions of research to the field and the lessons learned from these studies are discussed. Knowledge gaps in existing balanced scorecard research are identified, leading to consideration of several ideas for future research.

Paper ID: AFM2016_90002

Title: Perception versus reality: Do Chinese firms carry elevated risk of accounting fraud?

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Abstract

This paper investigates whether recent U.S. regulatory actions around reverse mergers exert any spillover effect on Chinese firms listed in China and whether Chinese firms carry elevated risks of accounting fraud compared to U.S. firms. To test possible spillover effect, this paper calculates three-day cumulative average abnormal returns (CAR) for Chinese stocks following each U.S. regulatory action and the aggregate CAR for a series of U.S. regulatory actions in 2000 and 2011. Then the study compares the accrual quality, conditional conservatism, and information content of accruals of Chinese firms versus U.S. firms for 2001-2011. This paper documents spillover effects on Chinese stocks but the spillover effect is not justified as empirical evidence indicates that Chinese firms do not carry any unique or elevated risk of accounting fraud. This study puts the financial reporting quality of Chinese firms into perspective. This study is important to academics, regulators and investors because of the increasing prominence of Chinese firms on the global capital markets and the concerns about the financial reporting quality of Chinese firms.

Paper ID: AFM2016_90003

Title: Executive Compensation and Compensation Risk: Evidence from Technology Firms

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Abstract

The purpose of this research is to investigate factors that contribute to technology firms paying higher compensation than non-technology firms, and why the mix of compensation at technology firms is different than the compensation packages at non-technology firms. Using a sample of 1,009 firm-year observations for the five-year period from 2001 to 2005, we find that the total compensation paid to the CEOs of technology firms is higher than the total compensation paid to the CEOs of non-technology firms, and that the value of the stock options granted to the former is greater than the value of the stock options granted to the latter. This difference can be explained by the risk premium that technology CEOs have in their compensation packages. The implications of this finding are discussed in the conclusion of the paper.

Paper ID: AFM2016_90008

Title: Who Knows What and When? The Information Production in MLU-IPOs

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Abstract

Using textual analysis techniques, we empirically analyse how the size of the IPO lead underwriting syndicate influences the information aggregation decision of the underwriters. We find that IPOs managed by multiple lead underwriters (MLUs) contain more informative content in the IPO prospectus. Informative content, which is a proxy for the pre-filing due diligence, suggest that MLUs produce more pricing information during the

pre-filing period. Further, we find that MLUs use more readable writing style in the IPO prospectus, which improves the information dissemination process. Lastly, we find that MLUs can substitute the costly bookbuilding process through the pre-filing information services they provide.

Technical Session 2

Paper ID: PMFS2016_90002

Title: Improvement of the relation between existing techniques of product and food protection and drugs safety management

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Abstract

The goal of this paper is to assess the existing methods of food and drugs safety management from the standpoint of product packaging and labelling. Several methods of safety management have been introduced in order to protect both supply chains and consumers from fake commodities, yet their effectiveness is a relevant question since counterfeiters keep up with the development and implementation of advanced protective means. Since verifying drugs' authenticity is a crucial issue nowadays and fake commodities represent significant economic and societal challenges, a new set of counter-measures must be put in place to address the advancing growth of the counterfeit threat. A conceptual model will be used to assess the existing problems of food and drug safety, and practical implications will be derived out of the real life situations that occurred with pharmaceutical manufactures. Analysis of the existing ways of how essential commodities are protected and propositions on how these ways could be upgraded will improve the understanding of food and drugs safety management. The improved system of food and drug safety management implies a set of actions that have to be undertaken in order to form a solid,

unified system and thus provide complete assurances of a product's safety. Not only does the security of supply chains and product traceability systems need improvement, but also existing public policies regarding compulsory food and pharmaceutical certifications need to be reviewed.

Paper ID: PMFS2016_90004

Title: Implementing Total Quality Management in Education: Compatibility and Challenges

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Abstract

Quality education is a great concern in many societies across the world. In a highly competitive education sector, the success of academic institutions depends on the quality of education. Educationalists, policy makers, scholars, and researchers are showing their sincere interest towards the total quality management (TQM) as it is recognized as an effective management philosophy for continuous improvement, customer satisfaction, and organizational excellence. Since this concept was initially developed in the manufacturing sector, therefore, there is a great deal of suspicion whether this philosophy is applicable in education. In this connection, the main objective of this study is to investigate the compatibility of TQM with education. At the same time, this study would try to identify key challenges in implementing TQM in education. It is assumed that this study would be able to draw a meaningful conclusion regarding the applicability of TQM in education as well as to create an awareness regarding those challenges which may create obstacles in implementing TQM in education.

Paper ID: LSCM2016_90002

Title: Application of Artificial Neuron Network in Analysis of Railway Delays

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Abstract

Punctuality is a key performance indicator of train freight transport. However, train delay arises often in the practice. To improve the efficiency of cargo train, prediction of train-delay is always an important research area. In this paper, a prediction model is established on the base of artificial neural network (ANN). Due the endogen drawback of ANN, several possible improvements are adopted. Consequently, an experiment is design to train and test the ANN-based model by a set of data from the practice. The results of the experiment demonstrate the significant propagation ability of the model.

Paper ID: LSCM2016_09002

Title: Multi-Objectives Productivity Improvement In Printing Industry Using Lean

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Abstract

The purpose of this paper is to formulate and identify the combined usage of the lean tools and the application of lean principles in printing industry. The paper suggests how to maximize the productivity with focus on improving material flow in a handicraft department.

Design/methodology/approach – This paper is based on a qualitative case study involving participant observations. The relationships among the three specific techniques; line balancing, standardized work and layout that are used in a Kaizen project of a printing factory are examined.

Findings – Application of a mix of lean improvement techniques resulted in significant productivity improvements of 10 to 35 per cent in the assembly area of the printing company. Based on

the outcomes of the improvement techniques applied in various work areas and observation of participants, the best combinations of lean techniques that can be applied for the company are identified.

Practical implications – This paper shows that a set of combined lean tools such as line balancing, standardized work and layout are suitable for improving productivity in printing operations, which is a labor-intensive and equipment-flexible process.

Originality/value – The findings from this study are expected to serve as guidelines for lean techniques that can be applied in the assembly area of the printing industry to improve productivity. It is expected that the findings from this research can potentially be applied to other assembly systems that are similar to the printing industry.

Paper ID: LSCM2016_09004

Title: Demand Forecast on Container Inventory in Shipping Lines: Focused on China Major Port

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Abstract

By the reason of import and export cargo volume imbalance in international trade, empty container which cargo is not stuffed into a container should return back to container deficit location.

The container imbalance ratio is around 49% out of total export volume and this means almost one of two export containers should move back to origin location to cover demand volume and overall worldwide reposition volume reaches 18 million teu(Seabury data in 2014)

The 18 million teu in 2014 is around 12.5% increase comparing to 16 million teu in 2012 and this shows trade imbalance become worse year by year along with trade volume increase. (See below trade volume table)

Around USD270 per teu is supposed to spend on

empty container returning back and total 4.9billion dollars is estimated for empty container reposition and the cost is considered as one of important item because it is one of controllable item inside company comparing to uncontrollable cost like ship's bunker or terminal cost and also the cost portion among total operation cost is very high.

*** Trade volume (Origin/Asia) (Unit : TEU)

Destination	Year	Export	Import	Imbalance	Ratio
N.America	2012	11,770,401	7,251,914	4,518,487	38%
	2013	12,064,925	7,391,153	4,673,772	39%
	2014	12,694,489	7,481,361	5,213,128	41%
Europe	2012	9,606,653	6,082,620	3,524,033	37%
	2013	9,569,421	6,041,104	3,528,317	37%
	2014	10,440,770	6,496,838	3,943,932	38%
M.East & South Asia	2012	7,317,017	2,992,195	4,324,822	59%
	2013	7,661,760	3,229,235	4,432,525	58%
	2014	8,385,877	3,183,794	5,202,083	62%
Latin America	2012	3,332,250	1,586,669	1,745,581	52%
	2013	3,293,062	1,626,468	1,666,594	51%
	2014	3,324,874	1,718,633	1,606,241	48%
Africa	2012	2,785,014	373,252	2,411,763	87%
	2013	2,897,441	579,792	2,317,650	80%
	2014	3,101,869	603,037	2,498,832	81%
Total	2012	4,811,336	18,286,649	16,524,687	47%
	2013	35,486,610	18,867,751	16,618,859	47%
	2014	37,947,879	19,483,663	18,464,216	49%

(Sourced from Seabury)

Like described above, world trade especially in containerized market is always causing export and import volume imbalance and the trade imbalance result in empty container reposition to container inventory deficit location from surplus location and containerized shipping line have to pay the empty reposition cost.

The containerized shipping lines always want to reduce the cost to maximize the profit and container demand forecast is essential to calculate accurate empty reposition volume and key to reduce the cost. If shipping line use wrong demand forecast data, the wrong volume could make wrong indication like wrong volume shipping on wrong vessel and wrong discharging location and so additional cost could be occur during divert or change the vessel and discharging location and urgent reposition could be occur in addition.

And also extra inventory is necessary to cope with the discrepancy of the differences between actual demand and forecast and this is causing additional capital and financing cost and so both direct and indirect cost could be involved in container demand.

So empty container demand forecast is important factor of cost saving and most of shipping line is using their own way to get accurate forecast data like using history data as well as estimate data from sales and operation team but there is many obstacles to improve the accuracy.

The obstacles of forecast accuracy improvement are

1. 4~5week Longterm forecast is necessary because motor vessel loading and discharging period is very long
2. Detailed forecast is necessary like by container type/size and by location and by weekly basis
3. Forecast by location could fluctuate along with vessel calling port change and service contract and product volume change
4. Forecast could be impacted also according to freight rate competition and allocation change and freight rate policy change and additional vessel capacity change.

And so the purpose of this study is to get what kind of stochastic method is most effective way by using history data for more accurate demand forecast and by calculation of forecast accuracy and compare with actual forecast accuracy and find out the produced forecast data could be usable or not

Final aim is to use the result produced by the effective stochastic method in empty reposition and for longterm plan of inventory size in corporate level.

Paper ID: WEC2016_90002

Title: The influence of macroeconomic environment on Australian household debt: An application of Dynamic OLS

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Abstract

Concerns about household debt increase with the escalating debt level in developed countries. Australia is a good example of this. This paper applies the dynamic ordinary least square (DOLS) method to explore the determinants and influences of Australian household debt. The results show that the rising Australian household debt results from the increased size of the economy, a booming housing market, a favourable macroeconomic environment and favourable government policies. Although the rising household debt stimulates economic growth in the short run, it may induce economic instability in the long run.

Paper ID: HREM2016_90002

Title: Tertiary Teachers Teaching Professional for Adjust Industry 4.0

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Abstract

This study examines 338 tertiary teachers' teaching professional and its influencing factors to serve as a school reference for adjust industry 4.0. The results show that teachers' teaching self-regulated has a significant direct effect on tertiary teachers' teaching professional, and teaching self-efficacy has a significant effect on teaching professional through self-regulated. The influence pattern and empirical data of teaching self-efficacy and teaching self-regulated on teaching professional has a good fit. This will serve as a reference for tertiary schools' encouragement of teacher professional development and Industry need.

Paper ID: PQM2016_90001

Title: Contractual governance effects on cooperation in construction projects management

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Abstract

Contractual governance is one of the most powerful mechanisms for stimulating cooperation between participants in construction projects. The authors, based on a functional perspective of contractual governance, divide contractual governance into control, coordination, and adaptation and distinguish between obligatory cooperation and voluntary cooperation of contractors. The objective of this study is to investigate the effects of the multiple functions of contract on contractors' cooperation in construction projects based on samples from the Chinese construction industry. The empirical results show that (1) contractual control has a positive influence on obligatory cooperation and a negative influence on voluntary cooperation; (2) contractual coordination positively influences both obligatory and voluntary cooperation; and (3) contractual adaptation positively influences voluntary cooperation while having no significant impact on obligatory cooperation. Moreover, the severity of contract enforcement is found to moderate the relationship between contractual governance and contractors' cooperation. These findings provide some implications for project managers regarding how to use contractual governance mechanism effectively to promote cooperation in construction projects.

Paper ID: SDEE2016_90010

Title: Drivers of sustainable development of Russian cities in the modern economic conditions

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Abstract

This article is devoted to a problem of the correct management of city economy, its capability to

training and encouragement of innovations, and also adjustment of social and economic parameters of infrastructure.

Paper ID:

Title:

Name:

Affiliation:

Email:

Abstract

Technical Session 3

Paper ID: ARAT2016_90001

Title: Analysis of Design Directions for Ground Control Station (GCS)

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Abstract

This study is a preparation phase for integrated visualization of battlefield situation. To develop the ground control station for unmanned systems, many factors have to be considered from the design stages, such as layout, information component, representation scheme, and human operation methods.

Considering such many factors can be very difficult, hence we conducted an in-depth investigation of design factors from major UAV stations around the world. We analyzed the design characteristics and the specifics. In conclusion, we were able to derive some common aspects of design characteristics, which lead to the successful design approach.

Paper ID: ARAT2016_90003

Title: Technical Analysis of VTOL UAV

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Abstract

Overall, this paper explains the related information about VTOL and trend of this technology worldwide. Also, it comes up with the distinction among VTOL and helicopter and fixed wing aircraft. This paper concentrates on domestic and international drones that utilize VTOL technology. Also, this paper gives the explanation about VTOL's performance and object. Furthermore, this paper predicts the future of VTOL and which area this technology going to be used.

Paper ID: AIR2016_10006

Title: Intelligent diagnostics of the responsible units of the vehicles in the conditions of Arctic and the Far North

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Abstract

The intellectual system diagnostics of vehicles at low temperatures. The system allows you to evaluate the current state of the components of vehicles, and the remaining service life. The system is formed convolution neural network using parallel computing technology Nvidia CUDA. This makes it possible to substantially increase the accuracy and performance of the system. The data is used as input signal of acoustic emission, ambient temperature and the amount of power load.

Paper ID: AIDM2016_90000

Title: Measuring Musical Rhythm Similarity: Further Experiments with the Many-to-Many Minimum-Weight Matching Distance

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Abstract

Musical rhythms are represented as sequences of symbols. The sequences may be composed of binary symbols denoting either silent or monophonic sounded pulses, or ternary symbols denoting silent pulses and two types of sounded pulses made up of low-pitched (dum) and high-pitched (tak) sounds. Experiments are described that compare the effectiveness of the many-to-many minimum-weight matching between two sequences to serve as a measure of similarity that correlates well with human judgements of rhythm similarity. This measure is also compared to the often used edit distance and to the one-to-one minimum-weight matching. New results are reported from experiments performed with three widely different datasets of real-world and artificially generated musical rhythms (including Afro-Cuban rhythms), and compared with results previously reported with a dataset of Middle Eastern dum-tak rhythms.

Technical Session 4

Paper ID: CIACV2016_90001

Title: An Interactive Learning Platform of Geographic Information using Automatic Motion Detection and Localization

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Abstract

Interactivity plays a crucial role in teaching and/or learning environment. In this study, we present a novel interactive learning platform of geographic information using automatic motion detection and localization. The platform is designed for children learners and integrates techniques of remote controlled robotics, image/video processing, and digital multimedia to provide immersive learning

experience. For system implementation, an improved Gaussian mixture model for adaptive back-ground subtraction and image processing techniques, were applied and shown to prove effectiveness in detecting and localizing the moving object, i.e., a Lego Mindstorms robot, even with dynamic background. Through interactive learning by hundreds of users (learners), our system has been shown to pose potentials and feasibility in providing immersive and pleasant learning environment of geographic information for children (or all ages) participants.

Paper ID: CIACV2016_90005

Title: Integrated Fire Detection and Alarm System Using Raspberry Pi

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Abstract

Early detection of fire is the key to prevent loss of life and property caused by fire disasters. An integrated fire detection and alarm system using Raspberry Pi is presented and can be incorporated in the Internet of Things (IOT) applications. Our system integrates technology of embedded systems, sensors, and vision-based fire detection method using webcam. In our system, gas sensors and flame sensors that are sensitive to gas leakage and little flame are used. In addition, our vision-based fire detection method is sensitive to bursting fire scenarios and can be described in the following steps, namely preprocessing, foreground region analysis, fire dynamic behavior analysis, and fire flow energy analysis. The experimental studies demonstrate that our system has achieved the sensitivity of 91% and the specificity of 84%, respectively. In summary, we have presented an alternative strategy to fire detection and alarm that has potential advantages over conventional fire (or

smoke) detectors, e.g., improved and early detection of fire, cost-effective, etc., for home or industrial usage.

Paper ID: ICRSTA2016_90001

Title: Features of behavior and use of Total Electron Content according to Hainan station data

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Abstract

Total electron content TEC of the ionosphere is irreplaceable parameter at an estimation of accuracy of positioning, causing requirement for developing a model of this parameter. It is shown that modern global and local models in the given region correspond well enough to observational values. Attraction of TEC for calculation of critical frequencies foF2 with the help of a median of an experimental equivalent slab thickness $\tau(\text{med})$ provides conformity with experimental data at level of 0.9 MHz in a concrete example of 2004 that is better than value of 1.42 MHz for the IRI model. The usage of $\tau(\text{med})$ of one station within radius of spatial correlation provides conformity at level of 1.05 MHz. Morphological features of TEC behavior in the given region in the quiet and disturbed conditions are described.

Paper ID: ICRSTA2016_90006

Title: Aerosol decreases in recent years over the Sichuan Basin, Southwest China: A perspective from MODIS observations

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Abstract

Environment problems especially air quality

degeneration gained more and more attraction from the public and influence our lives nowadays. In order to evaluate the role of aerosols on regional air quality, we discuss the spatial-temporal distribution and variations of the total aerosols and the fine mode aerosols, by using aerosol optical depth (AOD) and fine mode fraction (FMF) of AOD. The Moderate Resolution Imaging Spectroradiometer (MODIS) fine resolution aerosol products, which can be used in air quality monitor and resolving aerosol loading in complex terrain from 2001 to 2015 was used. On annual average, the AOD reveals two high value zones locate along Chengdu Plane cities group from north to south and Yibin cities group separately. In seasonal distribution, another high value zone in the eastern part of the basin emerges in cool seasons (spring and winter). The high FMF are mostly distributed in the rim of the basin that closed to the mountains, and the lower FMF values lies in middle and northern parts of the basin. The FMF value varied with seasons, which shows higher in warm seasons than cool seasons. During the 15 years, the AOD shows a decreasing trend and the FMF an increasing trend in the basin, but AOD and FMF both increase from 2001 to 2006 and decrease from 2006 to 2015 in most part of the basin. The topography influence the distribution of AOD and FMF profoundly especially the high AOD centers in the basin.

Paper ID: ICRSTA2016_90005

Title: UAV remote sensing for estimating the growth parameters of white radish and napa cabbage using multi-temporal aerial images and crop surface model.

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Abstract

Estimating overall yield of vegetable in the agricultural field is important for farmers to

establish farm management strategies suitable for the optimum production of vegetable. The yield or fresh weight of vegetable is related to biophysical parameters such as leaf length, leaf width, leaf count, leaf area. As a total amount of vegetable yield is subject to the summation of individual vegetable yield, estimation of the biophysical parameters of the individual vegetable within a field is important to develop a more accurate vegetable yield estimation model. UAV (Unmanned Aerial Vehicle) based remote sensing could allow more accurate mapping of crop growth status than is currently feasible with satellite images and manned aerial images. Therefore, UAV remote sensing technique enables canopy level observation which has been difficult for high altitude remote sensing platforms and provides more precise data for development of more accurate yield estimation model of vegetables. In this study, a UAV and low-cost cameras were used to measure the biophysical parameters of white radish and Napa cabbage. Multi-temporal images were obtained with RGB and NIR cameras being attached with UAV. The UAV images were acquired based on an automated flight mission that could maintain a height of 60 m relative from the take-off position while automatically follow the predefined path. UTM coordinates position of ground control points (GCPs) were collected using a DGPS (OEM615, Novatel, Canada) with a horizontal, vertical accuracy of < 0.02 m. Reflectance spectrums of radiometric calibration targets were measured with passive field spectrometer. Red and NIR light reflectances were also collected using an active sensor (Crop Circle, Holland Scientific, USA) scanning at 50 cm above the canopy. Acquired images were initially geo-located based on the log data of the low-cost GPS (LEA-6H, Ublox, Switzerland) mounted on top of the UAV and then mosaicked using a SfM (Structure from Motion) image mosaicking program (Pix4D, Switzerland). The mosaicked images were converted into vegetation index maps including excess green (ExG), normalized difference vegetation Index (NDVI). Digital surface models (DSMs) were also exported,

and height changes of the digital surface model were calculated by subtracting 1-st date DSM from n-th date DSM. The accuracy assessment results between the UAV vegetation index and the ground truth values showed the coefficient of determinations ~ 0.9 . The DSM height map showed a coefficient of determination 0.99 with RMSE of < 0.1 m when compared with manually measured heights. Two different models for estimating the biophysical parameters of vegetables, i.e., a vegetation index model and a DSM height model were developed showing a coefficient of determination > 0.7 when compared with the three different growth parameters, i.e., leaf length, leaf area, and fresh weight of white radish and Napa cabbage. And multi-linear regression model was used to improve estimation accuracy, showing a coefficient of determination > 0.8 . In future study, total yield of vegetable will be calculated from summation of individual vegetable and compared with actual total yield of vegetable.

Paper ID: ICRSTA2016_90004

Title: UAV remote sensing for estimating the growth parameters of white radish and Napa cabbage using multi-temporal aerial images and crop surface model

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Abstract

Monitoring the biophysical parameters of vegetables in a field during the growing season would allow the pre-estimation of vegetable yield before the harvest time. UAV (Unmanned Aerial Vehicle) based remote sensing could allow more accurate mapping of crop growth status than is currently feasible with satellite images and manned aerial images due to the ability to obtain images on a finer resolution. In this study, a multirotor-based UAV equipped with low-cost cameras was used to acquire the multi-temporal

images of white radish and Napa cabbage grown under different cropping treatments on an almost two-week-interval for three months. The flight mission of the UAV was programmed to maintain a flight height of 60 m from the ground while automatically following the predefined path. The acquired images were initially geo-located based on the log data of the low-cost GPS mounted on top of the UAV and then mosaicked using a SfM (Structure from Motion) image mosaicking program. The mosaicked images were converted into vegetation index maps based on excess green (ExG). In addition, digital surface models (DSMs) were exported to calculate the height changes of the surface images. Multiple linear regression models for estimating the biophysical parameters of white radish and Napa cabbage using both vegetation index and vegetable height as independent variables were developed showing coefficients of determination > 0.8 . The developed model were also validated with validation set showing coefficients of determination 0.7~0.9. In ongoing study, yield estimation model is being developed using estimated biophysical parameters.

Paper ID: CSGAD2016_90004

Title: Thermal Simulation for Two-Phase Liquid Cooling 3D-ICs

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Abstract

This work presents an algorithm for simulating more accurate temperature distribution in two-phase liquid cooling for three-dimensional integrated circuits than the state-of-the-art methods by utilizing local multi-linear interpolation techniques on heat transfer coefficients between the microchannel and silicon substrate, and considering the interdependence between the thermal conductivity of silicon and temperature values. The

experimental results show that the maximum and average errors are only 9.7% and 6.7% compared with the measurements, respectively.

Paper ID: CSGAD2016_90005

Title: Cooling circuit design and analytical comparisons to maximize cooling efficiency of the injection mold for the drip chamber having multi-cavities

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Abstract

Recently it prohibits to use PVC resin containing a plasticizer such as phthalates to the insertion or contact-type medical device(IV-set, etc). Therefore, there is a trend that demand for the IV-set made of non-phthalate PVC, thermoplastic polyurethane (TPU), or polyolefin elastomer (TPO) that a plasticizer is not added, but having an excellent flowability. The length and area of the cooling channel of the injection mold for the drip chamber having multi-cavities may be limited because the mold space and cooling pump capacity are finite. It is necessary to design the cooling system having the uniform mold temperature distribution, since the mold temperature distribution deviation is larger the quality difference of the drip chamber (transparency, elasticity, etc) occurs by the cavity number. This study was carried out to design the cooling channels of the injection mold for the drip chamber with the 48 cavities and CAE analyze in order to achieve the uniform mold temperature distribution. First, two cases of the cooling circuit design (serial, parallel) are proposed can be cooled the outside and inside of the drip chamber. Then injection molding analysis was performed by the same cooling, filling, and packing condition. The plastic for drip chamber was applied to TPO resin, and it was assumed that the coolant inlet shows turbulent flow ($Re = 10,000$). The cooling system design can be minimize the mold temperature distribution variation was determined

through the analysis results of mold temperature and part temperature by the cavity number. In addition, it was compared the mold temperature and part temperature by cavity number when the designs of cooling circuit are same but connection method of the cooling channel are different (individual connection, 2 zone block connection, 3 zone block connection). In case of the average mold and part temperature, parallel cooling circuit are lower than series circuit (mold temperature=5 °C, part temperature=14 °C). So cooling efficiency of the parallel channel is better than the cooling efficiency of the series channel. However, temperature variation of the mold and part for the series circuit is lower than its parallel circuit (mold temperature=1 °C, part temperature=10 °C). As a result, The cooling system to achieve a uniform temperature distribution in the mold and the part quality is serial circuit design. On the other hand, the average mold temperature and part temperature variation was reduced when it is connected the serial cooling channels 2 zone block → 3 zone block. But the average mold temperature and part temperature variation was increased when it is connected the parallel cooling channels 2 zone block → 3 zone block. Above the analysis result, it can be suggested the outline of the cooling system design that can be maintain the uniform mold temperature for the injection molding of the cylindrical shape similar to the drip chamber. Also, it is expected to be helpful to minimize mold temperature variation when the cooling channel are connected in the injection molding field considering the cooling pump capacity.

Paper ID: ICSPD2016_90008

Title: Simple Spin-Orbit based device for electron polarization

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Abstract

A central goal in quantum spintronics is to construct a device that polarizes electrons without the use of magnetic fields [1-3]. Spin-selective transmission of electrons through double-stranded DNA with spin polarizations exceeding 60% at room temperature [4] opens the possibility of using chiral molecules in spintronics, i.e., the generalization of electronics to include charge carrier spin effects in addition to charge carrier current effects. In this work we suggest a model for such a device in which electron polarization is due solely to spin orbit (SO) scattering. The device, displayed schematically in Fig. 1, is composed of two parallel metallic or semiconducting wires that are connected to each other by two links. Along these two links the electrons are subject to SO interactions, which are modeled by 2×2 unitary matrices e_{ix} on the first link and e_{iy} on the second link, where x, y, z are the 2×2 Pauli matrices, and the strength of the spin-orbit interaction is tunable by the strength of the external electric fields. The system is integrated into a DC electric circuit wherein the wires are connected to source (left) and drain (right) electrodes such that electrons can be transmitted from source to drain. In some sense, it is a minimal structure that reminds one of the DNA molecule, at least topologically, which has recently been considered as a central ingredient in modern spintronics [5-9].

1 2 V left electrode right electrode
 e_{ix} e_{iy} incoming outgoing outgoing
 FIG. 1: Schematic view of the two-link polarizer with spin-orbit coupling along the links. Incoming unpolarized electrons enter from the left and outgoing polarized electrons exit to the right and left. Quantum mechanically, calculation of experimental observables requires the solution of the following scattering problem: An electron at Fermi energy ϵ_F leaves the left electrode along wire $i = 1$ or $i = 2$ with its spin projection along the z direction being $\mu = \uparrow$ or $\mu = \downarrow$. After being scattered by the two link region it is either transmitted or reflected to wire $j = 1$ or $j = 2$ with its spin projection along the z direction being $\mu = \uparrow$ or $\mu = \downarrow$. The transmission and

reflection amplitudes for these processes are $t_{j;\mu}$ and $r_{j;\mu}$ respectively. Since there are four possible initial states (i, μ) and four possible final states (j, ν) , the transmission and reflection amplitudes can be arranged as 4×4 complex matrices denoted as $t(F, \mu, \nu)$ and $r(F, \mu, \nu)$. These matrices depend on the Fermi energy F and the spin-orbit strength λ . Knowledge of the transmission and reflection matrices enables computation of the most important experimental observables, namely the (dimensionless conductance) $g(F, \mu, \nu)$, the spin density on the right and left sides, $SR(F, \mu, \nu)$ and $SL(F, \mu, \nu)$, and the spin currents on the right and left sides, $JR(F, \mu, \nu)$ and $JL(F, \mu, \nu)$. Explicitly, let us define the three 4×4 spin matrices $S = (x, y, z) = \frac{1}{2} I_2 \otimes \sigma = \frac{1}{2} I_2 \otimes (x, y, z)$, where I_2 is the 2×2 unit matrix and \otimes means outer product of matrices. Each spin density has three spin components x, y and z , and the spin polarization on the left and on the right are just the z components of SL and SR respectively. The spin current is directed along x and has three spin components as well. The pertinent expressions are: $g = \text{Tr} t^\dagger t$, $SR = \text{Tr} t^\dagger S t$, $SL = \text{Tr} r^\dagger S r$, $JR = v_L SR$, $JL = v_L SL$. (1) Here v_L, v_R are the corresponding electron velocities. We have solved the quantum mechanical scattering problem analytically within a tight-binding model and obtained closed form expressions for all the observables defined in Eq. (1). In this model the Fermi energy is located within a band $-2 \leq F = -2 \cos k \leq 2$, where $0 \leq k \leq \pi$ is the crystal momentum, so that the observables are displayed as functions of k and λ . It is found that $S_x L = S_y L = S_x R = S_y R = 0$, $S_z L = S_z R \neq 0$, $J_x R = \sin k S_z R = -J_x L$. (2) Sample results are displayed in Figure 2. These results show that the spin polarization is highly correlated with the charge conductance g . Namely, the charge conductance reflects the underlying spin physics. Another thing to note is that the spin current is not conserved (it is different on the left and right sides of the sample). This means that the flux of the spin current outside (or inward) the central region does not vanish. This

is because of the presence of SO in the Hamiltonian H of the system, hence the Hamiltonian does not commute with the spin operator \hat{s} , $[\hat{s}, H] \neq 0$. (a) (b) (c) (d) FIG. 2: (a) and (b): For electron momentum $k_0 = 2/7$, the following quantities are plotted as function of the SO strength λ . (a) The transmitted polarization $SR_z(k_0, \lambda)$, (b) The conductance $g(k_0, \lambda)$. (c) and (d): For SO strength $\lambda = 2/5$, the following quantities are plotted as function of electron momentum k : (c) The transmitted polarization $SR_z(k, 0)$, (d) The conductance $g(k, 0)$. In both cases $SR_x = SR_y = SL_x = SL_y = 0$ and $SL_z = SR_z$, and $PR_x = PR_y = 0$. Thus, there is a non-zero polarization (spin density) that is equal on both sides. However, the spin currents on the left and right sides are oppositely directed, so there is a net spin flux from the central region outward (or inward). This is schematically shown in Figure 1. Quantitatively, this is expressed by a vector field, $T(r) = \nabla \cdot \psi(r) \psi^\dagger(r) [\hat{s}, H] \psi(r)$, referred to as the spin torque, where $\psi(r)$ is a (spinor) eigenfunction of H . We have shown that the continuity equation for the spin current implies that the flux is proportional to the volume average of the spin torque. In summary, we obtained spin density and spin current on both sides of the sample and established that the volume averaged spin torque \bar{T} is qualitatively related to the flux of the spin current. These results are remarkable from the point of view of quantum spintronics. A simple quasi-1D device whose Hamiltonian is invariant under time reversal is fed from one side by a beam of unpolarized electrons and yields non-zero spin currents of equal magnitudes in opposite directions. The device is schematically displayed in Fig. 1. References 1. David Awschalom and Nitin Samarth, Trend: Spintronics without magnetism, <https://physics.aps.org/articles/v2/50> and references therein. 2. Jaroslav Fabian, Alex Matos-Abiague, Christian Ertler, Peter Stano, and Igor Zutic, Semiconductor Spintronics, arXiv:0711.1461. 3. Roland Winkler, SpinOrbit Coupling Effects in Two-Dimensional Electron and Hole Systems, (Springer, 2003). 4. B. Gohler, V. Hamelbeck, T. Z. Markus, M. Kettner, G. F. Hanne, Z. Vager, R.

Naaman, H. Zacharias, Spin Selectivity in Electron Transmission Through Self-Assembled Monolayers of Double-Stranded DNA, *Science* 331, 894-897 (2011). 5. A.-M. Guo and Q.-F.Sun, Sequence-dependent spin-selective tunneling along double-stranded DNA, *Phys. Rev. B* 86, 115441 (2012). 6. R. Naaman and D. H. Waldeck, Chiral-Induced Spin Selectivity Effect, *J. Phys. Chem. Lett.* 3, 2178-2187 (2012). 7. D. Mishra, T. Z. Markus, R. Naaman, M. Kettner, B. Gohler, H. Zacharias, N. Friedman, M. Sheves, and C. Fontanesi, *PNAS* 110, 14872 (2013). 8. H. Einati, D. Mishra, N. Friedman, M. Sheves, and R. Naaman, *Nano. Lett.* 15, 1052 (2015). 9. A-M. Guo and Q-F.Sun, Spin-dependent electron transport in protein-like single-helical molecules, *PNAS* 111, 11658 (2014). Authors background Name Title Research Field Personal website Yshai Avishai Professor Theoretical Condensed Matter Physics <http://physweb.bgu.ac.il/~yshai/> Yehuda Band Professor Quantum Optics <http://www.bgu.ac.il/~band>

Paper ID: ECC2016_90002

Title: Design of Polymorphic Operators for Efficient Synthesis of Multifunctional Circuits

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Abstract

Systematic effort dedicated to the exploration of feasible ways how to permanently come up with even more space-efficient implementation of digital circuits based on conventional CMOS technology node may soon reach the ultimate point, which is mostly given by the constraints associated with physical scaling of fundamental electronic components. One of the possible ways how to mitigate this problem can be recognized in deployment of multifunctional circuit elements. In

addition, the polymorphic electronics paradigm, with its considerable independence on a particular technology, opens a way how to fulfil this objective through the adoption of emerging semiconductor materials and advanced synthesis methods. In this paper, main attention is focused on the introduction of polymorphic operators (i.e. digital logic gates) that would allow to further increase the efficiency of multifunctional circuit synthesis techniques. Key aspect depicting the novelty of the proposed approach is primarily based on the intrinsic exploitation of components with ambipolar conduction property. Finally, relevant models of the polymorphic operators are presented in conjunction with the experimental results.

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Title: Blur Image Edge to Enhance Zernike Moments for Object Recognition

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Abstract

Zernike moments (ZMs) are a set of orthogonal moments which have been successfully used in the fields of image processing and pattern recognition. A combination of edge blurring with ZMs computation was introduced. In this study, several kinds of artificial binary stripe images were used to investigate the effects of edge blurring on the absolute mean error of reconstructed image from high-order ZMs. After the blurring process, the reconstruction errors were increased dramatically at edge pixels, but decreased on non-edge pixels. The experimental results demonstrated that 2-pixel blurring approach provided better performance for reducing reconstruction error. Finally, a template matching between two real images was simulated to illustrate the effectiveness of the proposed method.

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