



IWGRS 2018

31 October 2018

UiTM, Malaysia

IEEE Workshop on Geoscience and Remote Sensing 2018

Date :

31 October 2018

Venue:

Office Of International Affairs
Jalan Graduan 1/23B, Persiaran Lingua
Shah Alam, Selangor, Malaysia

Organizers:



Institute of Research Management and Innovation (IRMI)
Universiti Teknologi MARA
40450 Shah Alam
MALAYSIA

COASTAL VULNERABILITY INDEX (CVI) MAPPING IN THE WEST COAST OF LANGKAWI

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ABSTRACT:

This is a study which implement Remote Sensing and GIS technologies to depict the coastal vulnerability index (CVI) of the West Coast of Langkawi stretching from Marina Harbour Park in Kampung Kok up until Tanjung Malai. The aim of this thesis is to frame an adaptable coastal vulnerability model for Langkawi in order to depict the vulnerability levels of several coastal zones located in its west coast. The manifestation of the study area's vulnerability requires six types of physical variables namely, geomorphology of the landform (procured from the Integrated Shoreline Management Plan of Langkawi), shoreline change between the year 2003 and 2013 (period of 10.6 years), coastal slope, sea level data interpolated across the study area, the island's incoming wave heights and local tidal range. In this study, Landsat 7 and Landsat 8 images with 30 m multispectral and 15 m panchromatic resolutions were utilized to depict temporal shoreline changes. High-resolution DEM data was processed for the depiction and modelling of the study area's coastal slope. The areas found with the highest vulnerability are Kampung Kuala Muda (MU4) and the northern part of Pantai Cenang that covers the stretch between Delima Resort and Langkawi Airport (MU6). Being the area with the predominant transportation facility in Langkawi, MU4 and MU6 must be on the top of the priority list in regards to mitigation measures for sea level rise risks. The techniques and information derived from this study can be used as an example for future CVI assessments in other regions of the Malaysian coast with either semi-diurnal or diurnal tides.

KEYWORDS: remote sensing, coastal erosion, sea level rise, coastal vulnerability index

ORGANIZER



CO-ORGANIZERS



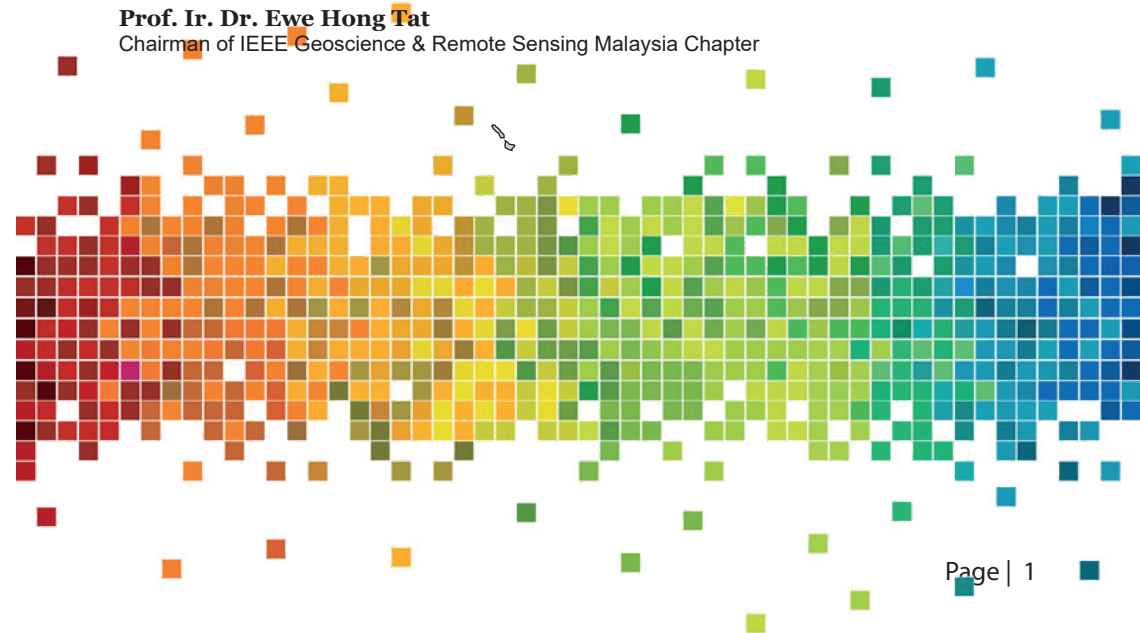
MESSAGE BY CHAIRMAN OF IEEE GEOSCIENCE & REMOTE SENSING MALAYSIA CHAPTER

A warm welcome to all of you to the IEEE Workshop on Geoscience and Remote Sensing (IWGRS) 2018. Also, we hope that our international participants will have some time to enjoy Malaysian diverse culture and visit many scenic places in Malaysia. Thank you very much for all your support, attendance and participation.

In recent years, there has been a tremendous increase of earth observation (EO) research activities and applications stemming from recent developments in advanced remote sensing technologies. This workshop is aimed at providing a forum for research community in geoscience and remote sensing to share knowledge and experience on recent developments and advancement in geoscience and remote sensing technologies, particularly in the context of Remote Sensing for Sustainable Environment.

Special thanks and appreciation to our three (3) Keynote Speakers Prof. Dr. Yoshihide Yamada, Assoc. Prof. Dr Zulkiflee Abd Latif and Dr Bryan Chu who would share with you their latest research outcomes and activities. My gratitude to fellow IWGRS members in the Organising Committee who worked and contributed their time relentlessly in making this workshop a success. Thank you.

Prof. Ir. Dr. Ewe Hong Tat
Chairman of IEEE Geoscience & Remote Sensing Malaysia Chapter





MESSAGE BY CHAIRMAN OF LOCAL ORGANISING COMMITTEE

On behalf of the organising committee, I would like to welcome all distinguished guests and participants to the International Workshop on Geoscience & Remote Sensing (IWGRS 2018). I would like to thank IEEE Geoscience and Remote Sensing Society Malaysia, for entrusting Universiti Teknologi MARA to organise this conference for year 2018.

his conference is attended by more than 50 participants from abroad as well as local. The secretariat has received an overwhelming response of technical papers which totaled more than 30, out of which, only 22 were able to be accommodated for both the Oral (18) and Poster (4) sessions.

I would like to take this opportunity to express my heartfelt gratitude to all organising committee members, both steering IEEE GRSS Malaysia and from UiTM, and those who are involved directly or indirectly, in ensuring the success of this workshop. Last but not least, on behalf of the Organizing Committee, I would like to wish all participants a successful workshop with fruitful deliberations, and networking.

Thank you.

ASSOCIATE PROFESSOR SR DR. ZULKIFLEE ABD LATIF, MIEEE
Chairman of Local Organising Committee

CRIME PATTERN-BASED RISK POPULATION USING EMERGING HOT SPOT ANALYSIS AND 80-20 RULE ANALYSIS FOR CRIME PREVENTION POLICING

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ABSTRACT:

Introduction. Crime and population are about a nature spatial pattern of risk. Crime pattern-based population is about to understand the effect population urbanism of crime event nature as an everyday life phenomenon. The term urbanism, according to Louis Wirth (1938) is refer population size, density of settlement and degree of heterogeneity of the urban population. Problem statement. It stressed the importance of living outcomes in the city for residents and the adverse effects like crime as a result of the city crisis which all authorities and residents of the city need to address immediately. Therefore, urbanism is an adverse effect that arises as a result of living in the city and includes creating crime in every day. This issue has attracted the attention of the United Nations (UN) through resolution 1995/9 the year released dated 24 July 1995 issued a white paper entitled "Guidelines for Urban crime prevention" that emphasis on urbanism as one contributory factor to the urban crime in the world. The common criminal measurements index of a world country is population-based. In Malaysia, measurement common using the rate of change by year for index-based crime before this has begun to adopt the measurement crime index based on population in 2017 (National Transformation Programme Report, 2017). The importance of identifying a risk population is based on the size, intensity and heterogeneity based on the Louis Wirth model will allow the target population at risk vulnerable to crime to be identified and that crime prevention policing can be carried out in a comprehensive manner more effectively. There also a lack of local study in this research area to provide using this model. The MURNInets indicators from Federal Department of Town and Country Planning Peninsular Malaysia for determine the sustainable city also limited the hot spot crime base on size population only and did not include density and heterogeneous of population. Research Question. The main question of the study is where and what condition size, density and heterogeneity of the urban population as a cause of crime phenomena every day and are they crime is pattern in population settlement which can describe as hot spot and cold spot place. Hypothesis. The study hypothesis is the larger size, the more densely populated, and the more heterogeneous the population of an area, the more accentuated the distribution of crime associated with urbanism pattern will occur in community settlement. Objectif. In this regard, the objective of this study is to identify risk size, density and heterogeneous of population that correlation to hot spot and cold spot crime pattern in the community settlement. Aim. The aim of study to produce a spatial crime mapping of population. Methodology. Common use tool for crime mapping is Geographic Information Systems (GIS) analysis and tool use for analysis is Emerging Hot Spot Analysis and 80-20 Rule Analysis to cluster a crime location and population based. Pearson's Correlation Coefficient also use to determine correlation between variables. To cover the shortcomings, the sustainable city indicator adopted by MURNInets for standard measuring crime hotspots has been adopted in this study. This study using 13 type of crime index from 2011, 2014 and 2017 year. The base maps of population using data population provided by Malaysia Department of Statistics and Malaysian Centre for Geospatial Data Infrastructure (MaCGDI) based on Population and Housing Census of Malaysia 2010 and projection population in year 2011, 2014 and 2017. Study Area. The study area is in Petaling and Klang District, Selangor. This area was chosen due to the most densely populated area of population and housing community in Selangor and is in the Greater Kuala Lumpur National Conurbation. Result. The result shows that several locations in the study area are identified as the hot spot and cold spots community settlement and meet the indicator set out in government guidelines. The importance of this study enables policy makers to implement an immediate action plan by providing a crime prevention policy in the identified location such as Safe City Initiative Programme. The study also provides a standardized model using GIS-based decision-making in identifying the risk population-based crime mapping to make the government's policing policy regarding to the Sustainable City.

**MODERNISING UNIVERSITY STUDENT RENTAL HOUSING SYSTEM
WITH GEOSPATIAL WEB AND MOBILE APPLICATIONS**

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ABSTRACT:

Housing has an essential element to quantify life with considerable economic, social, cultural and personal significance. Searching for house rentals may be painful, but it is worth holding out until student can find an ideal place to stay. Currently, the existing rental housing system provided in most of local universities are not only integrated with geospatial or mapping elements, but also have not specific rental housing choices of the students. Therefore, the aim of this study was to creatively develop a geoApps system for assisting university students and officers to find a right place to stay in. The user requirement revealed that most of the respondents need this Apps that help them to easily-find a house especially during in urgent situations. This Apps could also fulfill the elements needed by the respondents in looking for preferred housing characteristics. With the embedded of geospatial functions, it can be easy provided for student to make research, comparison tenancy prices and make better decisions of rental housing. This proposed Apps has demonstrated its essential tool to support spatial housing data management, access, analysis, sharing, and synthesis via the internet.

KEYWORDS: Geospatial, Mobile Apps, Web GIS-Based System, University Student, Rental Housing

**REMOTE SENSING AND GIS APPROACH FOR THE WATER POLLUTION WITH THE AID OF
MATHEMATICAL MODELLING IN AREA SURROUNDING UNIKL MIMET, LUMUT, MALAYSIA**

Fauziah Ab Rahman, Rarvin Pharasad Nalluswamy Azman Ismail, Universiti Kuala Lumpur, Malaysian Institute of Marine Engineering Technology, fauziahabra@unikl.edu.my

ABSTRACT:

Unikl MIMET is strategically located in Lumut, Perak, relatively known as the home-base of the Royal Malaysian Navy, it has acquired a tremendous response from the public and industries to produce graduates who are highly skilled and knowledgeable in the maritime industry. Shielding the surface water assets from wastewater contamination assumes a key part of the improvement. The transfer of wastewater into the surface water bodies prompts major issues and influences the general population in well-being perspectives. Particularly in the public ranges, the contamination of residential emanating releases into the adjacent surface water bodies made issues for people in general. This study is mainly to prepare base map from SOI Toposheets, to set a boundary layer to the administrative division in the study area with prepare various thematic layers in the block and remote sensing study through Landsat 8 and satellite imagery for the water pollution in the environment. The mathematical model used for valuation of each potential shelter according to the relevant criteria with a direct interface towards GIS application. From the results, the coordinates of 4 ° 16 '25.002' 'N 100 ° 40' 12.515 " E have very low water quality indexes of 55 and prove that the area is contaminated. The coordinates of 4 ° 16 '28.627' 'N 100 ° 40' 4.083 " E has the highest water quality index of 86 and show that the area is the cleanest area of all areas. Other areas showed a slightly polluted water quality index.

KEYWORDS: Wastewater contamination, GIS approach, Water quality.

**TECHNICAL PROGRAM COMMITTEE
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Zaharah Mohd. Yusoff
Ainon Nisa Othman
Saharuddin Lin

KEYNOTE SPEAKERS

		
<p>Prof. Yoshihide Yamada Radar Cross Section Measurement Facility at MJIT</p>	<p>Assoc. Prof. Dr. Zulkiflee Abd Latif Forestry Remote Sensing Technology: Development and Challenges</p>	<p>Dr. Bryan Chu Polarimetric Radar Scattering</p>

PROGRAMME

Venue:

Office Of International Affairs
Jalan Graduan 1/23B, Persiaran Lingua
Shah Alam, Selangor, Malaysia

OPENING CEREMONY

- 8.45 am **Arrival of Guest-of-Honour**
Assoc.Prof. Dr. Masran Saruwono
Dean of Faculty of Architecture, Planning & Surveying
- 9.00 am **Welcome Address by Organising Committee Chairperson**
Assoc. Prof. Sr Dr. Zulkiflee Abd Latif
- 9.05 am **Opening address by IEEE GRSS Malaysia Chairman**
Prof. Ir Dr. Ewe Hong Tat
- 9.15 am **Address and Opening Ceremony by**
Assoc.Prof. Dr. Masran Saruwono
- 9.30 am Refreshment / Networking / Poster Session

LANDSLIDE SUSCEPTIBILITY HAZARD STUDY IN ULU KELANG BY METHOD: PROBABILISTIC & ARTIFICIAL NEURAL NETWORK

Mardalina Yahaya, Dr. Ainon Nisa Othman, Syed Abdullah, Syarina Md Sah,
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ABSTRACT:

There are many different approaches to produce result of landslide susceptibility hazard map. This study focused on the methods of probabilistic and Artificial Neural Network (ANN) to produce the landslide susceptibility hazard map in Ulu Kelang, Selangor. The results of map were classified into three different classification techniques such as Natural Breaks, Equal Interval and Quantile. The results from the three classification techniques show different result of landslide susceptibility hazard zoning area. Those zoning areas must be validate by accuracy assessment process by comparing results of historical location of landslide occurrences with the result of landslide susceptibility hazard location. It proofs that ANN result provides more reliable result than probabilistic method as the accuracy for ANN were 50%, 43.75% and 62.5% for Natural Breaks, Equal Interval and Quantile respectively which are more higher than probabilistic method.

KEYWORDS: Probabilistic, ANN, Classification techniques, Accuracy assessment

DENSE FEATURE-BASED IMAGE MATCHING TECHNIQUE FOR SATELLITE IMAGES

Wei Yong Eng, V. C. Koo, Tien Sze Lim, Multimedia University
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ABSTRACT:

Image registration is well-studied area in computer vision research community. It is applied in various application ranges from medical imaging, robotics, and artificial intelligence. Recently, there is increase efforts to apply this advanced computer vision techniques into remote sensing field. It is to acquire the respective radar images and satellite images that are differ in time, viewpoint, and sensors for change detection and disaster warning. Two different image registration techniques: feature-based and image-based registration, are typically employed. Feature-based method is designed to register the images that are differ geometrically with respect to scale and orientation, by extracting the scale-invariant descriptors. Most registration techniques compare respective image gradients for robust image matching as images are tend to differ photometrically by various lighting conditions as well as various sensors. In this paper, it is to apply this advanced registration technique into remote sensing field, in matching the satellite images. The challenge is to identify the quantitative evaluation method as the ground truth is often absent in those remote sensing images. In literature, some researchers manually identify a few matching control points in image pairs or mosaiced the registered image on a checkerboard.

KEYWORDS: Image matching, Remote sensing images, Satellite images, Feature Matching

COMPLEMENTARY USE OF AIRBORNE LIDAR AND TERRESTRIAL LASER SCANNER TO ASSESS ABOVE GROUND BIOMASS/CARBON IN AYER HITAM TROPICAL RAIN FOREST

Cora Jane Lawas, Yousif Ali Hussin, Syed Abdullah, Evert Henk Kloosterman, Central Visayas Studies Center-University of the Philippines Cebu
cclawas1@up.edu.ph

ABSTRACT:

This study aimed to develop a method of assessing the AGB/carbon stock of a tropical lowland rainforest with a vertically complex structure. The method utilizes the complementary strengths of airborne LiDAR and terrestrial laser scanning system to assess the upper and lower canopies of the forest to achieve reasonable and robust results. The method was implemented in Ayer Hitam Forest Reserve in Malaysia. The upper canopy layer was assessed by generating tree parameters using airborne LiDAR to obtain height from CHM and segmenting the Ortho-photo to obtain CPA. DBH was modelled through multiple regression using the derived parameters as independent variables and the field DBH as the dependent variable. The modelled DBH achieved an R2 value of 0.90 and RMSE of 0.02 cm for the 16 plots. To estimate the AGB an allometric equation was applied to the modelled DBH together with LIDAR derived height. The modelled AGB was validated using the field DBH and LiDAR derived height. A robust model with an R2 of 0.98 and RMSE of 69.44 Kg was achieved for the 16 plots. The lower canopy layer was assessed using the registered scene from the TLS. This is to complement the trees that were not identified from the upper canopy layer. Scanned trees in the plot were extracted. Then DBH and height parameters were measured using RISCAN Pro software interface. These parameters were then used for the allometric equation to estimate the AGB for the lower canopy. The correlation of the TLS measured DBH and field measured DBH was established and achieved an R2 value of 0.99 and RMSE of 1.03 cm. The modelled AGB was estimated using the TLS measured height and DBH by applying the allometric equation. The model was validated using the field measured DBH and TLS derived height. The result was a robust model with an average R2 value of 0.99 and RMSE of 19.23 Kg for the 16 plots. The derived AGB from the upper and lower canopies were combined. The accuracy of the complementary method of deriving the estimated AGB from the two sensors was assessed by obtaining the R2 and RMSE of the two sensors. The achieved R2 and RMSE is 0.98 and 188.35 kg respectively for the 16 plots. The robust results in this study presented a potential method of addressing the need to provide accurate AGB/carbon assessment for a complex multi-layered tropical rain forest.

KEYWORDS: Airborne LiDAR, Terrestrial laser scanner, AGB, allometric equation

PLENARY SESSION 1

Chairperson: Prof Koo Voon Chet(MMU, Malaysia)

- 10.00 am **Keynote Address 1**
Professor Yoshihide Yamada
Malaysian - Japan International Institute of Technology (MJIT)
Topic: Radar Cross Section Measurement Facility at MJIT
- 10.30 am **Keynote Address 2**
Assoc. Prof. Sr Dr. Zulkiflee Abd Latif
Universiti Teknologi MARA (UiTM), Malaysia
Topic: Forestry Remote Sensing Technology: Development and Challenges
- 11.00 am **Keynote Address 3**
Dr. Bryan Chu
National Taipei University of Technology, Taipei, Taiwan
Topic: Polarimetric Radar Scattering, Fundamental and Applications

PLENARY SESSION 2

Chairperson: Dr. Zafri Baharuddin (UNITEN, Malaysia)

- 11.30 am **Paper 4: Optimization Of Total Number Of Scanning Stations For Terrestrial Laser Scanner (TLS) Survey**
S.K.P. Kushwaha, Photogrammetry and Remote Sensing Division, Indian Institute of Remote Sensing, ISRO, Dehradun, India
- 11.45 am **Paper 5: Fine Tuning an NWP Blended Radar Nowcasting System Using Two Severe Rainstorm Events**
Yip Weng Sang, Malaysian Meteorological Department
- 12.15 pm **Paper 6: 3D mapping concept and field evaluation result of the latest Mobile Mapping System**
Junichi Takiguchi, Mitsubishi Electric Corporation, Japan
- 12.30 pm **Paper 7: A Study of Scattering Pattern of Vegetation Medium using Computational Electromagnetics**
Syabeela Syahali, Multimedia University, Malaysia
- 12.45 pm **Paper 8: Application of UAV in agriculture for crop assessment: A review**
Ang Yuhao, Department of Civil Engineering, Faculty of Engineering, Universiti Putra Malaysia, 43400 Selangor, Malaysia.
- 1.00 pm Lunch

PLENARY SESSION 3

Chairperson: Dr. Lim Tien Sze (Multimedia University,

- 2.30 pm **Paper 9: A Study on Basal Stem Rot in Oil Palm with L band Synthetic Apecture Radar (SAR)**
Chia Ming Toh, Universiti Tunku Abdul Rahman (UTAR), Malaysia
- 2.45 pm **Paper 10: Landspout and Hail Detection Utilizing Radar Products**
Fauziana Ahmad, Malaysian Meteorological Department, Malaysia
- 3.00 pm **Paper 11: Multispectral sensor for Precision Agriculture Mapping**
Siti Nur Alia Roslan, Department of Geomatic Engineering, Faculty of Engineering & Technology Infrastructure, Infrastructure University Kuala Lumpur, Kajang, Selangor
- 3.15 pm **Paper 12: Assessing Quality of Derived Terrain and Tree Height Model using Full-waveform LiDAR Remote Sensing and UAV-based Aerial Imagery in Tropical Rainforest**
Syaza Rozali, Applied Remote Sensing and Geospatial Research Group, Faculty of Architecture, Planning and Surveying,

PLENARY SESSION 4

Chairperson: Dr. Gobi Vetharatnam (UTAR, Malaysia)

- 3.30 pm **Paper 13: Classification Of Urban Vegetation Using Ndvi Threshold Method With Very High Resolution (VHR) Pleiades Imagery**
Haslina Hashim, Applied Remote Sensing and Geospatial Research Group, Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA, Malaysia
- 3.45 pm **Paper 14: Identification of Degradation Areas in the Central Forest Spine of Perak and Kedah Through Geospatial Imagery Database**
Khairul Nizam Abdul Maulud, Universiti Kebangsaan Malaysia (UKM)
- 4.00 pm **Paper 15: Evaluating Global Navigation Satellite System (GNSS) Space Service Volume (SSSV) Performance via Trimble Planning**
Dinesh Sathyamoorthy, Science & Technology Research Institute for Defence (STRIDE), Ministry of Defence, Malaysia
- 4.15 pm **Paper 16: Dense Feature-Based Image Matching Technique For Satellite Images**
Wei Yong Eng, V. C. Koo, Tien Sze Lim, Multimedia University

IDENTIFICATION OF DEGRADATION AREAS IN THE CENTRAL FOREST SPINE OF PERAK AND KEDAH THROUGH GEOSPATIAL IMAGERY DATABASE

Khairul Nizam Abdul Maulud, Wan Shafrina Wan Mohd Jaafar, Sharifah Mastura Syed Abdullah, Syarina Md Sah
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ABSTRACT:

Malaysia has been experiencing rapid land use and forest cover changes of the original forested areas over the past few decades due to massive degradation. There is a need to reconnect fragmented forest areas as part of sustainable development and to have a continuously forested area known as central forest spine (CFS). Geographical Information System (GIS) and remote sensing techniques offer the best way to identify those areas of degradation and land use change. Remotely sensed data were used to generate normalised difference vegetation index (NDVI), an important indicator that quantifies the health of vegetation. From the NDVI generated map, forest cover change, location and the level degree of forest degradation were determined and the results were established in a form of geospatial database for the purpose of CFS management.

KEYWORDS: Degradation, Forest, NDVI

EVALUATING GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) SPACE SERVICE VOLUME (SSSV) PERFORMANCE VIA TRIMBLE PLANNING

Dinesh Sathyamoorthy, Science & Technology Research Institute for Defence (STRIDE), Ministry of Defence,
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ABSTRACT:

This study is aimed evaluating Global Navigation Satellite System (GNSS) Space Service Volume (SSV) performance in terms of number of visible GNSS satellites. This study focuses on the two GNSS systems that currently have full operating capability (FOC), namely Global Positioning System (GPS) and GLONASS. The study is conducted using Trimble Planning, which is a mission planning tool used to predict GNSS coverage at a given location and time. It is observed that GPS and GLONASS can each provide continuous coverage for up to altitude of 8,000 km. Combined use of GPS and GLONASS allows for increased GNSS satellite availability at altitude of 8,000 km, and continuous coverage at altitude of 12,000 km. The availability then degrades with increasing altitude, due to increasingly poor GNSS satellite geometry. It is proposed that further studies be conducted via GNSS simulation, whereby the accuracy of GNSS readings at various altitudes can be measured.

KEYWORDS: Global Navigation Satellite System (GNSS), Space Service Volume (SSV), Trimble Planning, Number of visible GNSS satellites, GNSS satellite geometry

ASSESSING QUALITY OF DERIVED TERRAIN AND TREE HEIGHT MODEL USING FULL-WAVEFORM LIDAR REMOTE SENSING AND UAV-BASED AERIAL IMAGERY IN TROPICAL RAINFOREST

Syaza Rozali, Zulkiflee Abd Latif, Muhammad Helmi Abdullah, Asmadi Abdul Wahab, Zulkiflee Abd Latif, syazarozali@gmail.com

ABSTRACT:

Canopy height model (CHM) derived from a remote sensing technology; airborne LiDAR and UAV-based image have been applied to extract relevant forest inventory information. This research evaluates the digital elevation model (DEM) from both data for the estimation of canopy height of forest cover using natural neighbor and structure from motion (SfM) method. Ground control point is observed on the field and the individual location of each trees covered on both data and image is recorded for validation. The accuracy of elevation for both data is evaluated by determining the RMSE, R2, and the correlation between field data. Boxplot and histogram derived from statistical language are used to determine the outliers and shows better classification of canopy height. T-test is carried out for comparative analysis between the two data. Full-waveform ALS gives lower RMSE, ± 3.539 compared to UAV-based image in DEM accuracy with field ground point, ± 4.684 . The comparative analysis shows there is a significance difference between the data in canopy height estimation. Therefore, full-waveform ALS data show more effective for an accurate estimation of forest attribute compared to UAV-based image.

KEYWORDS: Full waveform LiDAR, UAV, Canopy height model, Remote Sensing, Tropical Rainforest

CLASSIFICATION OF URBAN VEGETATION USING NDVI THRESHOLD METHOD WITH VERY HIGH RESOLUTION (VHR) PLEIADES IMAGERY

Haslina Hashim, Zulkiflee Abd Latif, Nor Aizam Adnan, zabdlatif@gmail.com.my

ABSTRACT:

Recently the use of remote sensing data for urban mapping has increased along with the availability of very high resolution (VHR) satellite data such as Quickbird, Worldview and Pleiades. This article presents the use of very high resolution (VHR) remote sensing data for urban vegetation mapping. This study aimed to evaluate the use of Pleiades imagery to extract the information of urban vegetation in urban area of Kuala Lumpur. Normalized Difference Vegetation Index (NDVI) were employs with VHR data to find Vegetation Index for classification process of vegetation and non-vegetation classes. Land use classes are easily interpreted by computing their Normalized Difference Vegetation Index for Land use land cover classification. Maximum likelihood was performed for the classification phase. NDVI were derived from the imagery to help and assist the classification process. NDVI method is applied according to its characteristic like vegetation at different NDVI threshold values. The result showed three classes of landcover that consist of low vegetation, high vegetation and non-vegetation area. The accuracy assessment was then performed using the visual interpretation and overall accuracy achieved was 70.7391% with kappa coefficient of 0.5382. This study found that the proposed threshold method using NDVI value able to identify and classify urban vegetation with the use of VHR Pleiades imagery and need further improvement when apply to different area of interest and different land use land cover characteristics.

KEYWORDS: Remote Sensing, Normalized Difference Vegetation Index, High Vegetation, Low Vegetation

4.30 pm **Paper 17: Complementary Use Of Airborne Lidar And Terrestrial Laser Scanner To Assess Above Ground Biomass/Carbon In Ayer Hitam Tropical Rain Forest**
Cora Jane Lawas, Yousif Ali Hussin, Syed Abdullah, Evert Henk Kloosterman, Central Visayas Studies Center-University of the Philippines Cebu

4.45 pm **Paper 18: Landslide Susceptibility Hazard Study In Ulu Kelang By Method: Probabilistic & Artificial Neural Network**
Mardalina Yahaya, Dr. Ainon Nisa Othman Syed Abdullah, Syarina Md Sah, Applied Remote Sensing and Geospatial Research Group, Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA, Malaysia

5.00 pm Tea and closing ceremony

POSTER SESSION.

Poster 1: Modernising University Student Rental Housing System with Geospatial Web and Mobile Applications.
Luqman Nulhakim Mazlan and Abdul Rauf Abdul Rasam, Faculty of Architecture, Planning and Surveying University Teknologi MARA, Selangor, Malaysia

Poster 2: Remote Sensing And GIS Approach For The Water Pollution With The Aid Of Mathematical Modelling In Area Surrounding UNIKL MIMET, Lumut, Malaysia.
Fauziah Ab Rahman, Rarvin Pharasad Nalluswamy Azman Ismail, Universiti Kuala Lumpur, Malaysian Institute of Marine Engineering Technology

Poster 3: Crime Pattern-Based Risk Population Using Emerging Hot Spot Analysis and 80-20 Rule Analysis for Crime Prevention Policing.
Hasranizam H., Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia

Poster 4: Coastal Vulnerability Index (CVI) Mapping in the West Coast of Langkawi.
Nor Aizam Adnan, Fatin Farzana Abdilah, Fazly Amri Mohd, Zulkiflee Abd Latif, Applied Remote Sensing and Geospatial Research Group, Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA, Malaysia



KEYNOTE ABSTRACT 1

RADAR CROSS SECTION MEASUREMENT FACILITY AT MJIIT

Yoshihide Yamada

ABSTRACT:

A radio wave measurement facility is completed in Malaysia-Japan International Institute of Technology (MJIIT), UTM, KL on the end of August 2018. This facility can be applicable for measurement not only usual antenna characteristics but also radar cross section (RCS) and dielectric constant of a material. In this lecture, features of RCS measurement and some measured examples will be presented. In RCS measurement, the target is placed on a turn table and antennas for transmit and receive are set opposite side in an anechoic chamber (5.6 m (L) x 2.9 m (W) x 2.8 m (H)). Because the coupling from a transmit antenna to a receive antenna is rather large, measured dynamic range is limited by this coupling. In this system, by employing time domain measurement, the effect of coupling is deleted and large dynamic range is achieved. As for measurement equipment, a vector network analyser (10 MHz to 43.5 GHz) that has time domain function is using. In measurement, transmitted frequency is swept at some frequency band. The received signal is Fourier transformed and time domain signals are produced. By setting a time window at an adequate time interval, only the target signals are selected. The time difference of coupling signal and target signal is very large, the coupling signal is easily deleted. As a result, large dynamic range can be achieved in RCS measurement. Some measured examples of a scale model car will be presented to show the effect of the time domain measurement. This RCS measurement facility will be applicable for measurement of radio scattering from a ground soil or any materials. I'm expecting many researchers use this facility for their researches.

KEYNOTE ABSTRACT 2

FORESTRY REMOTE SENSING TECHNOLOGY: DEVELOPMENT AND CHALLENGES

Zulkiflee Abd Latif

ABSTRACT:

To consistently and repeatedly monitor forests over large areas, it is desirable to use remote sensing data and automated image analysis techniques. Several types of remote sensing data, including aerial photogrammetry, optical multispectral scanner, hyperspectral scanner, RADAR, LiDAR (Laser) data have been used by forest research and operational agencies to detect, identify, classify, evaluate and measure various forest cover types and their changes. Over the past decades tremendous progress has been made in demonstrating the potentials and limitations of the applications of remote sensing in forestry. Remote sensing can detect, identify, classify, evaluate and measure various forest characteristics in two ways: qualitatively and quantitatively. In a qualitative way remote sensing can classify forest cover types to: tropical forest, mangrove forest, swamp forest, forest plantations, etc. While the quantitative analysis can measure or estimate forest parameters (e.g., dbh, height, basal area, number of trees per unit area, timber volume and woody biomass), floristic composition, life forms, and structure. For several types of applications of remote sensing in forestry in specific regions of the world such as tropical areas, users of forest information are demanding new establishment of sensors and platforms. In order to see what kind of information we can extract from the current remote sensing sensors and platforms and how accurate is that, an inventory of all remote sensing applications in forestry is needed. This lecture presents a state of the art inventory of all remote sensing applications in forestry

LANDSPOUT AND HAIL DETECTION UTILIZING RADAR PRODUCTS

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ABSTRACT:

The occurrence of hail and landspout are needed to study by forecasters for issuing the severe weather warnings to publics and agencies related to disaster mitigation. The radar products that consisted of reflectivity and velocity products are mainly used for the severe weather analysis. The indicator of cyclonic, anti-cyclonic, divergence or convergence using velocity products can provide the signature of adverse weather phenomenon. Meanwhile, the vertical cross-section of reflectivity products beneficial for two-dimensional views of radar echoes. In fact, the height of cloud and details structure of cloud with its development of storms can be determined using this technique. In this findings, the landspout is hard to detect because its presence typically happen before the precipitation occurs. The short-lived and weak characteristics of landspout is not possible to detect by Doppler radar data since the interval time of velocity products is every 30 minutes. Hence, more studies are needed to find the characteristics of landspout in Malaysia. In the meantime, study by Japan Meteorology Agency (JMA) using Numerical Weather Prediction (NWP) Potential Indices Model discovered that the landspout can be predicted one day before the occurrence using this model. Therefore, it is recommended to study about this model for delivering the landspout warnings issuance. Subsequently, the hail phenomenon can be detected by utilizing the vertical cross-section of reflectivity products which 55 dBZ and above can produce hails at the storm areas. In conjunction with top of cloud that greater than 15 km and point of maximum reflectivity higher than freezing level values (0°C) from radiosonde data can help forecasters to determine the hail occurrence. As a result, the issuance of hail warnings can be issued by analysing the radar products related to velocity and reflectivity products. Though, issuance of landspout warnings have to be studied further on another radar products or the velocity products should be improved to every 10 minutes. On the other hand, radar as observation tool consisted of many products that can be examined for further research in disseminating of adverse weather warnings. The forecasters have to bear in mind that the radar products should be investigated in term of characteristics, features and significant indicator of severe weather events in association with satellite, tephigram and observation data for the accurate of dissemination of warnings.

KEYWORDS: Hail Landspout, Base reflectivity, Base velocity

MULTISPECTRAL SENSOR FOR PRECISION AGRICULTURE MAPPING

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Precision Agriculture (PA) is a holistic management to increase the output and minimise the input, as well as to protect the environment from any excessive chemical. Precision Agriculture in Malaysia is an ongoing research and development, especially in paddy field by using the advanced technology to implement the PA concept in the agriculture management. Unmanned Aerial Vehicle (UAV), is one of the technology that can be used in PA. Multispectral imagery taken by UAV, is a brilliant tool in PA for farmers and agriculture officer in Malaysia to monitor the entire field. The imagery is used to monitor the health and condition of the plants for the whole area. It can record the changes condition in the particular area. The UAV contains the multispectral sensor to capture the valuable imagery in four different bands that are important to monitor the pattern correlation, plant condition (plant stress), nutrient efficiency, soil condition and overall of the area. The advantages of UAV is the capability to cover a large area in a single flight. The resolution of the spatial and spectral resolutions is higher compared to satellite imagery. The complete package is suitable to analyze the crop and soil condition in a very quick and efficient way. The concept and method can be used as a guideline to take a fast action or as early warning system for the crop monitoring. All the data can be stored as temporal data for the change detection analysis. The objective of the paper is to monitor the crop health of the paddy fields at the early stage by using UAV with multispectral sensor. The NDVI map was produced and it can be used as an indicator to monitor the plants status and condition in the field. The UAV provides an alternative to farmers and agriculture officer to monitor their crop and plant for the fast action to improve the management system. The dataset can be accessed online for the further analysis and prediction analysis in the future.

KEYWORDS: Rice mapping, UAV, Multispectral sensor and NDVI Map

APPLICATION OF UAV IN AGRICULTURE FOR CROP ASSESSMENT: A review

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ABSTRACT:

Precision agriculture (PA) is a farming strategy to increase the production and reduce the input to maintain the food demand in the world. Unmanned Aerial Vehicle (UAV) as a tool used in crop monitoring for precision farming. UAV is a valuable component of the PA framework to collect the imagery in the field. The objective of this paper is to review the usage of UAV technology in agriculture application. The population is increasing and expecting to reach nine billion in 2050 is a big challenge in agriculture sector to maintain the food production globally. Yield in agricultural crops is one of the most important issues related to national food security and personal living standards. However, there are concerns such as climate change, different farming practices and pest and weed infestations that would affect the productivity of the yield as well. Overuse of agricultural inputs can certainly lead to a waste of resources and a serious of environmental pollution. Nonetheless, the traditional method such as crop scouting or field surveys is not efficient to identify nutrient status and crop condition. Traditionally, crop assessment has relied on ground-based field survey and visual observation, which are costly and time consuming. An efficient approach such as UAV technology in precision agriculture will help in examining crop assessment in real-time. UAV helps to collect the accurate and frequent imagery at any time at the bigger scale. The imagery can be analyzed to predict the condition of the crop and to help users for decision makings. In this paper, we found that UAVs play a role in fulfilling this important gap.

KEYWORDS: Precision agriculture, Drone, Unmanned Aerial Vehicle, agricultural input, crop assessment.

A STUDY ON BASAL STEM ROT IN OIL PALM WITH L BAND SYNTHETIC APERTURE RADAR (SAR)

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ABSTRACT:

In recent years, the demand for edible vegetable oil has seen an increase in terms of global demand due to the rapid growth of the human population. Palm oil is one of the main vegetation oil contributors as it is the one of the highest oil yielding crop per hectare. However, like any crop, oil palm is susceptible to major threats such as insects, vertebrates and diseases which can greatly reduce the yield of a plantation if proper countermeasures are not taken. Furthermore, these issues are often overlooked due to the huge size of plantation area while the traditional methods of inspection via manual labor often can be limited in effectiveness and efficiency. Certain oil palm diseases such as Basal Stem Rot (BSR) caused by Ganoderma fungus requires trained agronomist to properly identify as the symptoms which are not obvious under normal circumstances. As BSR causes the structure of the oil palm to deteriorate in terms of their biophysical parameters, it is possible to use L band microwave synthetic aperture radar (SAR) to detect the presence of Ganoderma. In this paper, preliminary findings on the relationship of biophysical parameters of Ganoderma infected palms with L band microwave backscatter coefficient are shown and discussed. Initial results showed that L band SAR has the potential to detect Ganoderma infected palms due to the significant change in oil palm structure as the disease progresses.

KEYWORDS: Oil Palm, Ganoderma, Basal Stem Rot, L Band SAR, Vegetation Remote Sensing

KEYNOTE ABSTRACT 3

POLARIMETRIC RADAR SCATTERING, FUNDAMENTAL AND APPLICATIONS

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Polarization is a special parameter of EMwave propagation. The definition of polarization describes the trajectory of E field. In RF/microwave domain, polarized EMwave is easy to control and realize with a suitable antenna design, so engineer and scientist can use polarimetric EMwave system in many applications. (Ex. communication, sensing, anti-noise, identification...etc.) For radar scattering application, the polarization information of radar is a very important feature. The polarimetric scattering mechanism represents the structure shape and the geometric relationship between radar and target. Compare to the other radar sensing technology, like multiple bands, interferometry stereo and moving indicator, polarimetric radar sensing is the also a cost effective way to find the target features. In this talk, original polarimetric scattering basic will be introduced first. The EM modeling results of polarimetric scattering over snow surface will be shown after. For application, coastal or crop monitoring using polarimetric SAR data can trace the scattering mechanism change in coastal/crop area. Color-base of radar polarimetry data give a big capacity to include all polarimetric scattering information in a full resolution color description.

ABSTRACTS

OPTIMIZATION OF TOTAL NUMBER OF SCANNING STATIONS FOR TERRESTRIAL LASER SCANNER (TLS) SURVEY

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ABSTRACT:

Surveying techniques have always played a primary role in engineering surveying, recent advances and development in new instruments and methods of data capturing and processing have introduced the chance to increase the accuracy and the amount of information obtained. This research is focused to optimise the number of scanning positions for Terrestrial Laser Scanning (TLS) data acquisition. More scanning positions in Laser Scanning increases the size of the data collected by the instrument and covers all the portions of the target with increasing the point density. In this work, the number of TLS scanning stations were optimised depending on the 3D Shape file of the target, possible accessible area of the terrain features and the scanning parameters of the instrument. This work reduces the bulkiness of the TLS data by reducing the scans and repetition of the more overlapping regions between the scans

KEYWORDS: Terrestrial laser Scanner, TLS parameters, 3D shape file, optimum TLS scanning parameters and positions.

FINE TUNING AN NWP BLENDED RADAR NOWCASTING SYSTEM USING TWO SEVERE RAINSTORM EVENTS

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ABSTRACT:

At the moment skillful nowcasting involved blending Numerical Weather Prediction (NWP) output with radar extrapolation. The source of skill came from combining the good skill of radar extrapolation at short lead times and then extending the good skill at longer lead times by accounting for the growth and decay of radar echoes through NWP reflectivity. Current literature regarding nowcast generated by blending radar extrapolation with NWP output include the works of Cheung, Li and Wong (2015), Wang et al. (2015), Wong and Lai (2006) and Diong et al. (2017). The aim of this work was to find the optimal settings of the nowcasting system known as the Radar Integrated Nowcasting System (RaINS) operationalized by the Malaysian Meteorological Department (MMD). Two heavy rainfall episodes were used as case studies to fine tune RaINS. The first rainfall episode is a cyclonic vortex over the northern Peninsular Malaysia on the 5th November 2017 while the second rainfall episode is associated with the remnants of tropical storm Kai Tak over the eastern Peninsular Malaysia on the 23rd December 2017 as reported by JTWC. RaINS was configured by determining the NWP reflectivity, weightages between NWP and radar, and radar extrapolation settings that gave the highest accuracy. It was shown in this work that the best NWP input was the maximum reflectivity between 1000hPa to 100hPa, the optimum weight in the current nowcast cycle was the best weight 3 hours ago, and the most accurate radar velocity was the average of all radar velocities computed from different parameters.

3D MAPPING CONCEPT AND FIELD EVALUATION RESULT OF THE LATEST MOBILE MAPPING SYSTEM

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ABSTRACT:

Mobile mapping systems are playing an increasingly important role in capturing spatial data, coinciding with the rapidly growing demand for detailed, up-to-date 3D maps of cities, roads and large buildings. Thus, Mobile mapping systems are widely used in Public Survey, Asset Management, and Automotive related HD map for Automated driving. Mitsubishi Electric's the latest mobile mapping system called "MMS-G" is examined for its 3D mapping capability in Rotterdam, Netherland where satellite invisibility and multipath is occurred according to high rise buildings in urban areas. MMS-G is equipped with multi-GNSS dual-frequency carrier-phased receiver, high performance IMU, and high-range LIDAR in compact unit, which can be easily mounted/dis-mounted on the vehicle. The data from this mobile mapping system is processed automatically from positioning, IMU coupling, to coloring point cloud data from camera RGB data. Furthermore, manual processing of point clouds is labour-intensive and thus time-consuming and expensive. Thus, the state of the art of automatic classification and 3D mapping of road objects from point clouds is also described. In this article, the authors explain the concepts underlying the product and prove its initial design's feasibility and its accuracy and precision through pre-measured reference points.

KEYWORDS: Mobile Mapping System, 3D mapping, point clouds, automatic classification

A STUDY OF SCATTERING PATTERN OF VEGETATION MEDIUM USING COMPUTATIONAL ELECTROMAGNETICS

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ABSTRACT:

This paper is to study the application of computational electromagnetics in microwave remote sensing for modelling the layer of vegetation. Traditionally, the scattering pattern of the discrete scatterer in vegetation layer is described mathematically through the phase matrix of the medium which are derived analytically with assumption and approximation. In this paper, a new numerical method which is the Relaxed Hierarchical Equivalent Source Algorithm (RHESA) is applied in the calculation of the scattering pattern of the discrete scatterer in the vegetation layer. A 3D model of the dielectric scatterer in the vegetation layer is first created using ANSYS, a 3D modelling software. The 3D model is then simulated by RHESA to compute the scattered field. The simulated scattered field is compared with the scattered field of the current traditional model. Result shows that both patterns agree with each other, indicating good prospect of applying computational electromagnetics in vegetation medium in future.

KEYWORDS: Microwave remote sensing, Computational electromagnetics, Relaxed Hierarchical Equivalent Source Algorithm, Vegetation