2228th Conference

Geosciences & Geochemistry 2018

3rd International Convention on

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Geochemistry, Environmental Chemistry and Atmospheric Chemistry

October 19-20, 2018 | Ottawa, Canada

Scientific Tracks & Abstracts

Day 1

Long Guo, J Remote Sensing & GIS 2018, Volume: 7
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Exploring the sensitivity of soil sample numbers in digital soil mapping and then choosing a suitable soil sampling plan

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The soil sampling plan plays an important role in digital soil mapping because it can directly influence the quality of the sample datasets and hypothesis testing of different soil models. However, traditional sampling methods pay more attention to the geographical locations of the soil samples and ignore the spatial distribution characteristics of the soil types. The objective of this research was to check the performance of three traditional soil sampling methods, namely, random sampling, grid sampling and Latin hypercube sampling (LHS), and choose the suitable soil sampling numbers by three new indices: the ratio of sampling efficiency to performance (RSEP), the number of soil samples index (NSSI) and the comprehensive evaluation index of prediction accuracy (CEPA). Headwall hyperspectral sensors carried on a helicopter were used to collect visible and near-infrared spectral images (400–1,700nm) to predict the continuous the soil total carbon (STC) map. Our results showed that (1) hyperspectral images can be used to estimate the spatial distribution of STC at a spatial resolution of 3m, (2) the performance of the grid sampling method was better than random sampling and LHS, and (3) RSEP can be used to choose a suitable number of soil samples for the study region. Moreover, the actual field sampling plan can further certify the results of this study, and the hyperspectral images and the RSEP can be helpful in choosing a suitable soil sampling plan based on different demands and can offer useful information for digital soil mapping.

Biography

Long Guo has completed his PhD at the age of 28 years from Wuhan University. He is one lecturer at Huazhong Agricultural University now. He has published more than 6 papers in reputed journals. His research focuses on the quantitative remote sensing of soil, the geostatistics, and the digital soil mapping.

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Notes:

Xiaojie Li, J Remote Sensing & GIS 2018, Volume: 7
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An HSV and LBP-based method for identifying surface state

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A remote sensing method is usually used to invert the surface information, and which method to use varies with the surface state. Therefore, surface state identification is a prerequisite for inverting the surface information and the precision of identification determines the precision of the inverse calculation. This paper presents an HSV and LBP-based method to identify in real-time the state of the surface in the field. In this method, the LBP operator with an improved threshold is combined with the color histogram to form a single feature vector and the discriminant conditions are established. Then, the KNN algorithm is used to calculate the similarity between the single feature vector and the surface image to identify and classify the surface state. This method is tested on 200 randomly selected images taken in the field, and the result shows that the precision of identification is 100%, much higher than 95%, which is the precision of the LBP-based method.

Biography

Xiaojie Li received her PhD degree in optical engineering in 2010 from Tianjin University, Tianjin, China. Her major fields of study mainly include photoelectric detection technology, remote sensing data processing and high performance computing. She is presently an associate professor in Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences, China. Her current interests include remote sensing data processing and high performance computing.

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Day 1

Vishavjeet Singh Goraya, J Remote Sensing & GIS 2018, Volume: 7
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Himalayan Foreland basin :A perspective and Endeavours

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Extensive exploration activities are being carried out in Basins which are geologicallyconsidered prospective but so far indicated only presence of hydrocarbons and such Basins arecategorised as Category-III .Himalayan Foreland and Ganga Basin are on thenorthern passive margin of the Indian plate which is undergoing sub-duction. Major portion of passive margin had been sub-ducted and in the foreland part only palaeo-Basin margin sediments (Late Proterozoicand Early Palaeozoic Vindhyan Group) covered by huge thickness of post-collision molassic sediments (Siwalik Group) are present. These Basins are being explored since long but excepting a few gas shows,no other encouraging result was found. The main target here is the palaeo-passive margin . Eocene wedge-out which are expected to be matured in the deeper part of the subduction zone. Eocene wedges were encountered in drilled wells in Arunachal and Punjab respectively on the eastern and western extremities of this peripheral foreland area with local shows. The Himalayas in northwest India is divided into different lithotectonic blocks by a number of E-W regional boundary thrusts. Exploration in the Himalayan Foreland Basin commenced in the 50's and ONGC drilled about 31 wells. The various structural plays envisaged in a fold thrust belt have been targeted and explored within the hanging wall blocks of Jawalamukhi Thrust and the triangle zone structures with limited success which proved existence of thermogenic gas in the area, albeit in noncommercial quantities.

Biography

Vlishavjeet Singh Goraya is a GeoScience engineer and his area of expertise is the unconventional sources of energy from India and has presented many papers in the national and international conferences. The author is a very keen geoscientist from the University of Petroleum & energy studies.

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Scientific Tracks & Abstracts

Day 2

Ghafoori Mohammad, J Remote Sensing & GIS 2018, Volume: 7
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Empirical relationships between geomechanical parameters in one of the oil field, Persian Gulf, Southeastern Iran

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Measurement of geomechanical properties of rocks, especially static properties, is a timeconsuming and costly process and requires the preparation of samples. Therefore, indirect methods such as ultrasonic and physical tests are often used to predict the geomechanical properties such as uniaxial compressive strength (UCS), static Young's modulus (Es) and Poisson's ratio. In this paper, Ilam formation in one of the oil field in Persian Gulf, has been studied. Formation lithology in the study area is mainly composed of Cretaceous limestone and clay limestone. Core analysis for investigation of structural elements was conducted in large scale. In order to determine the geomechanical properties of reservoir rocks, uniaxial compressive strength, physical and ultrasonic tests were conducted on 28 core specimens. According to the collected data, empirical relationships for predicting of UCS, Ed and Poisson's ratio were achieved and compared with previous results for limestone. Also, the UCS values obtained from the tests were compared with theUCS predicted values from Vp and Ed respectively. Consequently, advisable method for estimating UCS was investigated afterward, the Es values achieved from the test results were compared with the predicted values of ES from Vp, Ed and UCS. Then the most appropriate method for estimating Es was investigated. According to the comparisons, if ultrasonic and density data are available, estimation of the UCS value based on Ed is recommended. As well as, estimating the Es values from UCS is also more precise.

Biography

Mohammad Ghafoori is the Professor of engineering geology and rock mechanic at Geology Department, Ferdowsi university of Mashhad, Iran. He obtained his PhD in rock mechanic from Sydney University, Australia under the supervision of the Professor JP Carter and Professor D. W.Airey in 1995. He has published more than 300 papers.

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Video presentation

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Muluken N Bazezew, J Remote Sensing & GIS 2018, Volume: 7
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Integrating Airborne LiDAR and Terrestrial Laser Scanner forest parameters for accurate estimation of above-ground biomass/carbon in Ayer Hitam tropical forest reserve, Malaysia

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Parameters of individual trees can be measured from LiDAR data provided that the laser points are dense enough to distinguish tree crowns. Retrieving tree parameters for above-ground biomass (AGB) valuation of the complex biophysical tropical forests using LiDAR technology is a major undertaking, and yet needs vital effort. Integration of Airborne LiDAR Scanner (ALS) and Terrestrial Laser Scanner (TLS) data for estimation of tree AGB at a single-tree level has been investigated in part of the tropical forest of Malaysia. According to the complete tree-crown detection potential of ALS and TLS, the forest canopy was cross-sectioned into upper and lower canopy layers. In a first step, multiresolution segmentation of the ALS canopy height model (CHM) was deployed to delineate upper canopy tree crowns. Results showed a 73% segmentation accuracy and permissible to detect 57% of field-measured trees. Two-way tree height validations were executed, viz. ALS-based upper and TLS-based lower canopy tree heights. The root means square error (RMSE) for upper canopy trees height was 3.24m (20.18%), and the bias was –1.20m (–7.45%). For lower canopy trees height, RMSE of 1.45m (14.77%) and bias of 0.42m (4.29%) were obtained. In a second step, diameter at breast height (DBH) of individual tree stems detected from TLS data was measured. The RMSE obtained was 1.30cm (6.52%), which was as nearly accurate as manually measured-DBH. In a third step, ALS-detected trees were co-registered and linked with the corresponding tree stems detected by TLS for DBH use. Lastly, an empirical regression model was developed for AGB estimated from a field-based method using an independent variable derived from ALS and TLS data. The result suggests that traditional field-methods underestimate AGB or carbon with the bias –0.289 (–3.53%) Mg, according to approximately 11%. Conversely, integrative use of ALS and TLS can enhance the capability of estimating more accurately AGB or carbon stock of the tropical forests.

Biography

Muluken N Bazezew received a BSc degree in Forestry from Hawassa University, Ethiopia in 2010. He also received MSc degree in Environmental Science (Energy and Climate Change) from Addis Ababa University, Ethiopia in 2014. Most recent of his educational background is MSc degree in Geo-Information Science and Earth Observation from University of Twente, Faculty of Geo-information Science and Earth Observation (ITC), the Netherlands in 2017. Currently, he is a geospatial expert and working as Lecturer and Researcher at Dilla University of Ethiopia since 2010. He is expertise in the application of earth observation data in natural resources, environment, and agriculture. Current research interest is the application of medium to very high-resolution images, LiDAR technologies (ALS and TLS) and Unnamed Aerial Vehicle (UAV) in natural resources and agricultural monitoring.

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Vishavjeet Singh Goraya, J Remote Sensing & GIS 2018, Volume: 7
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Depositional environment and tectonics during the sedimentation of Jodhpur and Bilara Groups of Rocks, Marwar Supergroup of India

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The time span across the Precambrian-Cambrian boundary is very important in the history of Earth as the most significant changes have taken place in the lithosphere, biosphere, and atmosphere. Evidence of such changes is preserved only a few places where they are affected in general by post-depositional deformation and metamorphism resulting in modification and even total obliteration of the original syn-sedimentary signatures in the rocks. One such site is the deposits of the Marwar Basin which are more or less un-deformed and unmetamorphosed and represents a time period from Neoproterozoic to Lower Cambrian. The rocks of the Marwar Basin are designated as the Marwar Supergroup which attains a thickness of ca. 1000m (Chauhan, 1999). Malani igneous rocks, represented dominantly by rhyolites, form the basement rocks for the Marwar Basin. Pareek (1981, 1984) has subdivided the Marwar Supergroup into three groups: the Jodhpur Group, the Bilara Group, and the Nagaur Group. Each group has been further subdivided into formations. The Jodhpur and Nagaur Groups are represented by arenaceous facies and the Bilara Group is represented by a calcareous facies. The Jodhpur Group represents the oldest group of the Marwar Supergroup which unconformably overlies the Malani Igneous Suite. The Bilara Group represents the middle part of the Marwar Supergroup and is made up of calcareous facies with dominant lithology made up of dolomite, limestone and dolomitic limestone and shales. The outcrops of the Bilara Group are scanty and can be seen only in the southern part of the basin. The depositional environments of the Jodhpur & Bilara Groups are interpreted on the basis of the information derived from the outcrops during a field visit to the basin. According to our inferences, the Jodhpur group was deposited in the Fluvial environment whereas the Bilara group was deposited under Marine environment.

Biography

Vlishavjeet Singh Goraya is a Geo Science Engineer and his area of expertise is he unconventional sources of energy from India and has presented many papers in the national and international conferences. The author is a very keen geo scientist from the University of Petroleum & energy studies.

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Richardson Abraham-Adejumo, J Remote Sensing & GIS 2018, Volume: 7
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A simplified approach to hydraulic units' prediction with the aid of wireline logs

Richardson Abraham-Adejumo
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Wireline logs data are quite handy and can be preserved over a longer period when compared with core samples, as such; they are readily available for researchers. Nonetheless, the choice of the values of the factor of tortuosity (a) and cementation factor (m) when using wireline logs alone for evaluation could vary, depending on the discretion of one researcher to the other. Hence, with the same data for any evaluation by different researchers, there are possibilities of seeing slightly-notable-to-notable differences in the results. This work tries to review the uses of the values of a and m over time, and suggest modified equations that are not dependent on the direct computation of formation factor (F) and irreducible water saturation (Swiir). For details studies, F, Swiir, free fluid index (FFI) and porosity (Φ) are usually evaluated at some intervals of depths. This study is intended to reduce the variation in the results that may come with the choice of the values of these factors (a and m) within the same formation and minimize drudgery. The direct relationship between porosity and other parameters, such as permeability (K), reservoir quality index (RQI) and flow zone indicator (FZI) was helpful to simplify the equation for each of them. FFI is a measure of the moveable hydrocarbon, and RQI and FZI are used to predict the reservoirs flow units. A simplified approach involving the suggestion of handier equations for FFI, K, RQI, and FZI, with quick-look models for the prediction of flow units, was presented.

Biography

Richardson Abraham-Adejumo has completed his MTech (Exploration Geophysics) and currently completing his PhD under the supervision of Prof Fabio Taioli at the Institute of Energy and Environment (IEE), University of Sao Paulo (USP), Brazil. He has published 4 papers in reputed journals. While he is working on the sixth paper, the fifth is under review for publication in the Journal of Marine and Petroleum Geology (JMPG) in Elsevier. His main area of interest is petroleum geology/geophysics with the bias for petrophysics and seismic methods for hydrocarbon exploration. He is well informed in environmental/engineering geophysics and groundwater geophysics.

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