

# **Imaging and Geospatial Technology Forum (IGTF 2016)**

ASPRS 2016 Annual Conference and co-located JACIE  
Workshop

Fort Worth, Texas, USA  
11 - 15 April 2016

ISBN: 978-1-5108-2621-2

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2016) by American Society for Photogrammetry & Remote Sensing  
All rights reserved.

Printed by Curran Associates, Inc. (2016)

For permission requests, please contact American Society for Photogrammetry & Remote Sensing  
at the address below.

American Society for Photogrammetry & Remote Sensing  
5410 Grosvenor Lane, Suite 210  
Bethesda, Maryland 20814-2160  
USA

Phone: (301) 493-0290  
Fax: (301) 493-0208

[webmaster@asprs.org](mailto:webmaster@asprs.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

<b>Adaptive Region Merging Segmentation of Airborne Imagery for Roof Condition Assessment</b> .....	1
<i>Fan Wang, John Kerekes, Yandong Wang</i>	
<b>Application Of The Specular Array Radiometric Calibration (SPARC) Method For The Vicarious Calibration Of Landsat Sensors</b> .....	2
<i>Stephen Schiller</i>	
<b>Applying 3-D Virtual Modeling for Visualization and Analyses in Geoscience Research and Education at the Community College and University Level</b> .....	3
<i>Tara Urbanski, Lionel White, Carlos Aiken</i>	
<b>ASPRS Aerial Data Catalog: The Source for Finding Aerial Collections</b> .....	4
<i>John Faundeen</i>	
<b>Assessment of Landslide Vulnerability Using Neural Network Models and Logistic Regression</b> .....	5
<i>Moung-Jin Lee, Jeong-Ho Yoon, Jeong-Ho Lee</i>	
<b>Assimilation of the National Elevation Dataset and Launch of the 3D Elevation Program into the U.S. Geological Survey Spatial Data Infrastructure</b> .....	6
<i>Samantha T. Arundel</i>	
<b>An Automated Approach in Detecting and Attributing Forest Disturbance Types</b> .....	7
<i>Lu Liang, Todd Hawbaker, Zhiliang Zhu, Xuecao Li, Peng Gong</i>	
<b>Automated Change Detection and Oil Field Monitoring Technology Innovation</b> .....	8
<i>Andrew Tewkesbury</i>	
<b>Automated Relative Orientation for Indoor Mapping with Prior Trajectory Information</b> .....	9
<i>Fangning He, Ayman Habib</i>	
<b>Automatic Detection of Validation Targets in Terrestrial Mobile Mapping Surveys</b> .....	10
<i>Chisaphat Supunyachotsakul, Steven D. Johnson, James S. Bethel, Scott M. Peterson</i>	
<b>Automatic Extraction of Building Outlines from High Resolution Aerial Images</b> .....	11
<i>Yandong Wang</i>	
<b>Automatic Extraction of Poles from Terrestrial Laser Scanning Data of Electrical Substation Sites</b> .....	12
<i>Mostafa Arastoumia, Derek D. Lichti</i>	
<b>Automatic Pedestrian Trajectory Detection to Support Planning</b> .....	13
<i>Arpad Barsi, Tamas Lovas, Zsuzsanna Igazvölgyi, Karoly Radóczy</i>	
<b>Automating Accident Scene Reconstruction Using UAS based Photogrammetric Reconstruction and Orthophotos</b> .....	19
<i>Benjamin John Vander Jagt</i>	
<b>Big Data - No Problem; Big Analysis in a Secure Environment - Problem</b> .....	20
<i>Shawana Johnson, Earl J Dodd</i>	
<b>Biodiversity Response to Industrialization and Human Expansion as seen in Land Cover Change within the Western Ghats in the Hassan District</b> .....	21
<i>Supraj Prakash, Srinivas Bettadpur, Teresa Howard, T. P. Ramamoorthy</i>	
<b>Building a Living Map of the World: Petabyte-scale Real-time Multi-sensor Image Analysis in Commercial Cloud</b> .....	22
<i>Steven Brumby, Michael S Warren, Rick Chartrand, Eduardo Franco, Ryan Keisler, Tim Kelton, Mark Matthis, Daniela Moody, Sam Skillman</i>	
<b>Building High Performance MUSES Processing Systems in Amazon Web Services</b> .....	23
<i>Lewis Graham</i>	
<b>Building Identification and Reconstruction from Point Cloud Data</b> .....	24
<i>Yun-Jou Lin, Zhou Guo, Ayman Habib</i>	
<b>Building Location-intelligent Internet of Things Innovations with Open Geospatial Consortium SensorThings API</b> .....	25
<i>Steve Liang</i>	
<b>Cañon La Lagartera Mangrove Forest: Spatial Analysis of Land Cover Change in Jiquilisco, El Salvador</b> .....	26
<i>Cerian Gibbes, Jesse Miller</i>	
<b>Calculation of the Modulation Transfer Function of the RapidEye Sensors</b> .....	27
<i>Sara Bahloul</i>	
<b>Caldera Cruisers</b> .....	28
<i>Zakiya Shivji</i>	
<b>Calibration and Validation for KOMPSAT-3A</b> .....	29
<i>DongHan Lee, DooChun Seo, JaeHeon Jeong, HaeJin Choi</i>	
<b>Calibration Standards and Services for Emerging Remote Sensing Technologies</b> .....	30
<i>David W. Allen</i>	
<b>Capture and Use of Geospatial Provenance in Mainstream GIS</b> .....	31
<i>Jason Tullis, Rachel Linck</i>	
<b>Challenges in Processing of Endangered Species Spatial Data for National Environmental Policy Act (NEPA) Screening Reports</b> .....	32
<i>Samuel Rajasekhar</i>	
<b>Classification of High-Dimensional Rasterized LiDAR Datasets Using Evolutionary Computation</b> .....	33
<i>Henrique Momm, Evan Snapp</i>	
<b>Coastal Zone Mapping and Imaging Lidar (CZML) Survey Results Over Gatun Lake, Panama</b> .....	34
<i>Michael Sitar, Vinod Ramnath Ramnath</i>	

<b>Collecting 3D information from Orthoimages Using Orthoimage Elevation Synchronous Model</b> .....	35
<i>Junfeng Zhu, Xiaodong Xiong</i>	
<b>Combined Bundle Adjustment of Multiple LiDAR Strips and Aerial Images Using Straight Lines</b> .....	36
<i>Xiaodong Xiong, Zhiquan Zuo, Zhengjun Liu, Yongjun Zhang</i>	
<b>Comparative Analysis of Different LiDAR System Calibration Techniques</b> .....	37
<i>Megan M. Miller, Ayman Habib</i>	
<b>Comparison of Aerial Surveying Techniques for Mapping Submerged Structures in Shallow Coastal Water</b> .....	38
<i>Behrokh Nazeri, Michael J. Starek</i>	
<b>A Comparison of Surface Solar Irradiance from GOES Products with Ground Measurements in San Antonio, Texas</b> .....	39
<i>Shuang Xia, Hongjie Xie, Rolando Vega</i>	
<b>A Comparison of the Urban Expansions and Their Driving Factors of Two Border Cities: Laredo in the US and Nuevo Laredo in Mexico</b> .....	40
<i>Chunhong Zhao, Jennifer Jensen, Benjamin Zhan</i>	
<b>Computation of Scalar Accuracy Metrics LE, CE, and SE As Both Predictive and Sample-based Statistics</b> .....	41
<i>John Dolloff, Jacqueline Carr</i>	
<b>Consistent Land Surface Temperature Data Generation from Irregularly Spaced Landsat Imagery</b> .....	56
<i>Peng Fu, Qihao Weng</i>	
<b>A Constraint-based Integrated Approach for Fusing GPS, INS, and Camera/Video Data for Achieving Highly Accurate 3D Models Using Smartphone and Tablets</b> .....	57
<i>Michel Morgan</i>	
<b>Co-registering and Normalizing Stereo-Based Elevation Data to Support Building Detection in VHR Images</b> .....	58
<i>Alaeldin Suliman, Yun Zhang, Raid Al-Tahir</i>	
<b>Creating Interactive Colorized 3D Models from Historical Aerial Imagery</b> .....	59
<i>Zachary Bortolot</i>	
<b>Cross Satellite Time Series Crop Classification</b> .....	60
<i>Mustafa Teke, Yasemin Yardimci</i>	
<b>Cultural Landscape Documentation with 3D Point Cloud Methods In the Southeastern United States</b> .....	61
<i>Thomas R Jordan, Cari L Goetcheus, Marguerite Madden</i>	
<b>Data Gap Classification for Terrestrial Lidar Derived Digital Elevation Models</b> .....	62
<i>Matthew S. O'Banion, Michael J. Eddy, Michael J. Olsen</i>	
<b>A Dense Time Stack Change Detection Analysis of Cropland Phenology Using Images from Unmanned Aerial Systems</b> .....	63
<i>Michael Bomber, Cyril Wilson, Joseph Hupy</i>	
<b>Determination of Mineral Abundance in Beach Sands Using Spectroscopic Data and Traditional Methods of Sand Composition and Grain Size Analysis</b> .....	64
<i>Molly Elizabeth Smith, Caiyun Zhang, Anton Oleinik</i>	
<b>Determining the Appropriate Season for Calculating Nutritional Carrying Capacities of Gazella Bennettii (Chinkara) using Satellite Imagery</b> .....	65
<i>Zahra Ghaffari, Bahman Shams Esfandabad, Nathan Allen Currit, Mahmoud Karami</i>	
<b>Different Solutions for Processing Drone Imagery</b> .....	66
<i>Frank Obusek, Joe Mostowy</i>	
<b>Digitization of Fractures Using Photorealistic Surface Models of Fault Zones in Fish Lake Valley, California</b> .....	67
<i>Rebecca Jessica Aguilar, Tiffany Savage, Carlos Aiken</i>	
<b>Disaster and First Responders Support</b> .....	68
<i>Terry Idol</i>	
<b>A Dual Spectroradiometer System for the Measurement of Field Reflectance Spectra Under Variable Atmospheric Conditions</b> .....	69
<i>Brian Curtiss</i>	
<b>Dynamics of Tropical Dry Forest Degradation and Deforestation in Mexico and Central America</b> .....	70
<i>Vaughn Smith, Carlos Portillo-Quintero</i>	
<b>Educational Tools and Lessons to Improve Remote Sensing and GIS Workflows</b> .....	71
<i>Thomas Mueller</i>	
<b>Employing Remote Sensing Tools in Academia for Ramsay Fold Classification on a 3D Virtual Model As One Example of Utilizing Virtual Models of Geology</b> .....	72
<i>Tiffany Savage, Amy Webber, Carlos Aiken</i>	
<b>Enhancement of Trajectory Estimation for a Multi-Camera Indoor Mapping System Using Constrained System Motion</b> .....	73
<i>Ronald R Benziger, Ayman Habib</i>	
<b>Environmental Monitoring of Oil and Gas Sites Using Satellite Imagery</b> .....	74
<i>Dennis Nazarenko</i>	
<b>Environmental Monitoring of Remediated Oil and Gas Sites Using Multi-Sensor Satellite Data</b> .....	75
<i>Zhaohua Chen, Dennis Nazarenko, Paul Adlakha</i>	
<b>EPIC-simulated and MODIS-derived Leaf Area Index (LAI) Comparisons Across Multiple Spatial Scales</b> .....	76
<i>John Shepherd Iames, Ellen Cooter</i>	
<b>ESA Earth Observation for Oil and Gas (EO4OG) Project</b> .....	77
<i>Ola Grabak</i>	
<b>Estimating and Evaluating Surface Energy Fluxes and Evapotranspiration through Thermal and Multispectral sensors onboard an Unmanned Aerial Vehicle in Ames - Iowa</b> .....	78
<i>Athila Gevaerd Montibeller, Bingqing Liang</i>	

<b>Estimation of Surface Moisture in Urban Areas</b> .....	79
<i>Yitong Jiang, Qihao Weng</i>	
<b>Estimation of Variability in Water Resources in the Major River Basins of the World Using Satellite Data</b> .....	80
<i>Jessica Fayne, Venkat Lakshmi</i>	
<b>Evaluating Remote Sensing Data Impacts from the Bottom Up – A USGS Example</b> .....	81
<i>Zhouming Wu, Greg Snyder, Greg Stensaas, Bruce Quirk, Carolyn Vadnais, Peter Doucette</i>	
<b>Evaluating Single Photon and Geiger Mode Lidar Technology for the 3D Elevation Program (3DEP)</b> .....	82
<i>Qassim Abdullah, Jason Stoker, Amar Nayegandhi</i>	
<b>Evaluating Urban Agriculture's NDVI Signature</b> .....	83
<i>Tammy Parece, James B. Campbell</i>	
<b>Evaluation of Advanced Satellite Missions for Pipeline Monitoring Applications</b> .....	84
<i>Paul Adlaka, Igor Zhakarov, Zhaohua Chen, Chris Hardy, John Bennett, Dennis Nazarenko</i>	
<b>Evaluation of New Technologies for Commercial Lidar Data</b> .....	85
<i>Minsu Kim</i>	
<b>Extraction of 3D Road Assets Using a Low-cost Mobile Mapping System</b> .....	86
<i>Sudhagar Nagarajan, Nivedita Sairam</i>	
<b>Fast Mapping of Burned Lands from RapidEye Satellite Imagery for the Bureau of Land Management</b> .....	87
<i>Chad Lopez, Chris Cole, Ernie JK Liu, Nate Morton, Syed Ahmed</i>	
<b>Feature Template-Based Sweeping Shape Reverse Engineering Algorithm using a 3D Point Cloud</b> .....	88
<i>Tae Wook Kang, Sung Chul Hong</i>	
<b>Feature-based Approach for the Registration of Push-broom Imagery with Existing Orthophotos</b> .....	89
<i>Weifeng Xiong, Ayman Habib</i>	
<b>Field Data Collection Techniques for the Development of Remote Sensing Ground Truth, Including "the Most Accurate, Least Expensive, and Most Easily Applied" Method.</b> .....	90
<i>Kenneth Stumpf, Sage Romberg</i>	
<b>Fire Patterns and Land Use in Central America: A Study of the Agriculture-Conservation Interface</b> .....	91
<i>Malcolm Nichols, Kayla Inks, Jordan Hirro, Cerian Gibbes</i>	
<b>First In-flight Radiometric Calibration of the CBERS-4 MUX and WFI</b> .....	92
<i>Cibele Teixeira Pinto</i>	
<b>A Forecasting Method for Physical Pattern of Urban Spread in Fast Growing Fringe Areas: The Case of Istanbul</b> .....	93
<i>Seher Baslik, Ismail Ercument Ayazli, Mehmet Rifat Akbulut, Ahmet Emir Yakup, Mahmut Gultekin, Derya Kotay</i>	
<b>Generation of Autogen Areas Based on High-resolution Satellite Imagery</b> .....	94
<i>Wojciech Krzywda, Jaroslaw Wozniak, Michal Kedzierski, Anna Fryskowska</i>	
<b>GeoEye-1 Geolocation Accuracy and Band Co-Registration Analysis</b> .....	95
<i>Paul Bresnahan, Robert J. Powers, Luiz Henry Vazquez</i>	
<b>GeoLions</b> .....	96
<i>Leslie Jessen</i>	
<b>Geolocation Accuracy Performance of the DigitalGlobe Constellation During 2015</b> .....	97
<i>David Mulawa</i>	
<b>Geometric Quality Assessment of Lidar Data Based on Swath Overlap</b> .....	98
<i>Aparajithan Sampath, Greg Stensaas, Hans Karl Heidemann</i>	
<b>Geometry-Based Classification of Point Clouds</b> .....	99
<i>Yun-Jou Lin, Ayman Habib</i>	
<b>Geospatial &amp; Statistical Analysis of Mercury (Hg) and Methyl Mercury (MeHg) Distribution in East Tennessee Watersheds.</b> .....	100
<i>Shruti Lakkaraju, Maruthi Sridhar Balaji Bhaskar</i>	
<b>Geospatial Analysis of the Role of Agricultural Practices on Hypoxic Zone Development in the Mississippi River Delta: A Multitemporal Perspectives</b> .....	101
<i>Syler Behrens, Cyril Wilson</i>	
<b>Geospatial Analytics in Understanding Online Customer Reviews: an Exploratory Analysis</b> .....	102
<i>Mingshu Wang, Xiaolu Zho, Marguerite Madden</i>	
<b>Geospatial Event Detection through Tweets</b> .....	103
<i>Yuqian Huang, Claudia E. Aviles Toledo, Yue Li, Jie Shan</i>	
<b>Geospatial Technologies Meet K-12 STEM Curricula: Use of Remote Sensing As a Pedagogical Tool in Earth and Environmental Science Education</b> .....	104
<i>Heather J. Lynch, Catherine Hantz, Chandi Witharana</i>	
<b>Geospatial Technology and Education – Pathways from Education to Industry</b> .....	105
<i>J. Scott Sires</i>	
<b>Geospatial Technology and Education: The Future is Now</b> .....	106
<i>Pamela Kersh</i>	
<b>Geospatial Tools and Techniques for Public Safety</b> .....	107
<i>Ed Freeborn</i>	
<b>GIS Analysis of GEOBIA and Multi-Sensor Based High Spatial Resolution Land Cover Mapping of Hall County Georgia</b> .....	108
<i>J.B. Sharma, Joshua Nolan, John Dees, Benjamin Bennett</i>	
<b>Green-up Dates Over Tibetan Plateau: Advancing Or Postponing?</b> .....	109
<i>Liuxi Tian, Hongjie Xie, Yao Zhang, Weizhong Li</i>	
<b>High Density Colored 3D Point Clouds for City Modeling from Aerial Images and LiDAR</b> .....	110
<i>Philipp Grimm</i>	

<b>High Resolution Corridor Mapping with Large Format Digital Frame Cameras: A Review of Workflows and Achievable Accuracies</b> .....	111
<i>Steffen Lindenthal</i>	
<b>High-resolution Lidar Observations of Rookery Islands in the Upper Laguna Madre to Define a Monitoring Benchmark</b> .....	112
<i>Michael Schwind, Michael Starek</i>	
<b>How Do You Solve a Problem Like Goliath? - Challenges Faced and Lessons Learned in Executing a Gigantic Aerial Survey Project in a Developing Country</b> .....	113
<i>Mete Balam, Omur Demirkol</i>	
<b>Hyperspectral and Extended Multispectral Remote Sensing: Phenomenology, Sensor Systems, and Data Processing</b> .....	114
<i>William Farrand</i>	
<b>Hyperspectral Detection and Mapping of Black Rock Coatings near Smelters</b> .....	115
<i>David Leverington, Michael Schindler</i>	
<b>Hyperspectral Imagine Data Collection, Processing and Applications: Potentials and Challenges</b> .....	116
<i>Bingqing Liang, Andrey Petrov</i>	
<b>Hyperspectral Remote-sensing Estimation of Corn Leaf Water Content</b> .....	117
<i>Anthony M. Filippi, Eric Guenther, Lee Tarpley, Abdul Razak Mohammed, Burak Güneralp</i>	
<b>Identifying Tree Hazards to Utility Infrastructure Using Terrain Optimized Airborne LiDAR</b> .....	118
<i>Jason Parent</i>	
<b>Image Fusion Methods Based on a Linear Mixing Model of Multispectral Remote Sensing Data</b> .....	119
<i>Gintautas Palubinskas</i>	
<b>Image Products from the New Hyperspectral Sensor DESIS</b> .....	120
<i>Janja Avbelj, Emiliano Carmona, Andreas Eckardt, Birgit Gerasch, Burghardt Günther, Gregoire Kerr, Harald Krawczyk, David Krutz, Aliaksei Makarau, Rupert Müller, Ingo Walter</i>	
<b>Imaging Spectroscopy Applications using the DESIS Hyperspectral Instrument on MUSES</b> .....	121
<i>William Ray Perkins, Rupert Mueller, Emiliano Carmona, Robert E Griffin, Randy Miller</i>	
<b>An Improved Component-Substitution-Based Image Fusion Approach</b> .....	122
<i>Kwan-Young Oh, Jeong-Ho Yoon, Hyung-Sup Jung, Jeongho Lee</i>	
<b>Improvements to and Update on the Absolute Radiometric Calibration of the DigitalGlobe Constellation</b> .....	123
<i>Michele Kuester</i>	
<b>Improving the Efficiency of Handling High Density LIDAR Point Clouds in GIS Platforms</b> .....	124
<i>Nivedita Sairam, Sudhagar Nagarajan</i>	
<b>Increasing Collaboration for Student Workflows</b> .....	125
<i>Jason A. Tullis</i>	
<b>An Initial Assessment of Timing for Identification of Tree Species Based on the Spectral Reflectance of Their Bark</b> .....	126
<i>Collin Taylor Marshall, Zachary J. Bortolot</i>	
<b>Integrating Point Clouds to Support Heritage Protection and VR/AR Applications</b> .....	127
<i>Gabor Bodo, Konstantinos Hadzijanisz, Boglarka Laki, Reka Lovas, Dora Surina, Beatrix Szabo, Barnabas Vari, Andras Feher</i>	
<b>Integrative Approach to Identifying Urban Farms in Detroit, MI</b> .....	135
<i>Joseph Grocholski, Jessica McCarty-Kern</i>	
<b>An Interoperable Internet of Things Solution for Emergency Management based on the OGC SensorThings API Standard</b> .....	136
<i>Steve Liang</i>	
<b>KOMPSAT-3A Geometric Cal/Val &amp; Quality Assessment</b> .....	137
<i>DooChun Seo, JaeHeon Jeong, DongHan Lee, HaeJin Choi</i>	
<b>Land Cover Change Analysis for Assateague Island National Seashore Post Hurricane Sandy</b> .....	138
<i>Heather Marie Grybas, Russell Congalton</i>	
<b>The Land Product Characterization System: A Tool for Comparative Analysis of Satellite Data and Products</b> .....	139
<i>Kevin Gallo</i>	
<b>Land Remote Sensing Program Initiatives at USGS</b> .....	140
<i>Peter Doucette, Timothy Newman</i>	
<b>Launch of TripleSat Constellation and its Products and Services</b> .....	141
<i>Wei Sun</i>	
<b>Law Enforcement Challenges in Forensic Crime Scene Processing</b> .....	142
<i>Troy Wilson</i>	
<b>LB Mapsters</b> .....	143
<i>Samantha Lustado</i>	
<b>LEICA DMC III Geometric in Flight Calibration and Practical Experiences</b> .....	144
<i>Christian Mueller</i>	
<b>Lidar Geometric Accuracy Assessment Workshop</b> .....	145
<i>Qassim Abdullah, Lewis Graham, Hans Karl Heidemann, Amar Nayeghandi, Aparajithan Sampath, James Young</i>	
<b>LIDAR Visualization and Data Management for Disconnected Collection Operations and Enterprise Imagery Production Environments</b> .....	146
<i>Bryan Lane, Dave Brett, Scott Pakula</i>	
<b>LiDAR-based Solar Mapping for Distributed Solar Plant Design and Grid Integration in San Antonio, Texas</b> .....	147
<i>Hongjie Xie, Tuan B. Le, Danial Kholdi, Bing Dong, Rolando E. Vega</i>	

<b>Mapping Agricultural Land Use by Integrating High Resolution Remote Sensing Imagery with Multi-temporal Landsat Data</b> .....	148
<i>Qian Lei</i>	
<b>Mapping Forest Leaf Dry Matter Content from Hyperspectral Data</b> .....	149
<i>Abebe Mohammed Ali, Andrew K. Skidmore, Roshanak Darvishzadea, Iris van Durea, Stefanie Holzwarth, Joerg Mueller</i>	
<b>Mapping Movements of Late Pleistocene Mammoths and Paleo-Indian Activity in the Southwest USA</b> .....	163
<i>Amanda D Aragon, Warren Lail, James R Biggs</i>	
<b>Mapping Prescribed Burns in Aransas National Wildlife Refuge with Historical Landsat Imagery</b> .....	164
<i>Benjamin Hemingway, Amy Frazier, Samuel Fuhlendorf, Adam Mathews</i>	
<b>Mapping Urban Land Cover - A Comparison of Classification Models for Aerial and LiDAR Data Fusion (Revised)</b> .....	165
<i>Nicole Gamboa, Caiyun Zhang</i>	
<b>Measuring the Nearshore Recovery of Seabird Islands with Aerial and Satellite Imagery</b> .....	166
<i>Lyndsay Rankin</i>	
<b>Merging Data from Multiple Platforms for Transportation Projects: Advantages and Challenges</b> .....	167
<i>Sonja Ellefson</i>	
<b>A Min-cut Approach to Building Detection from Airborne Lidar Point Clouds</b> .....	168
<i>Serkan Ural, Jie Shan</i>	
<b>MODIS derived vegetation Index for drought detection in the Southwest US</b> .....	169
<i>Zhuoting Wu</i>	
<b>Monitoring Annual Urban Growth in Northwest Arkansas with A 20-year Landsat Record</b> .....	170
<i>Ryan Reynolds, Lu Liang</i>	
<b>Motioning and Studying Rapid Development of Natural Hazards Along Receding Lake Environments Using Laser Scanning Data</b> .....	171
<i>Sagi Filin, Reuma Arav, Yoav Avni</i>	
<b>Multiband Pan Sharpening Using Correlation Matching Fusion Method</b> .....	172
<i>Alex Kachurin, Mark Rahmes, Morris Akbari, Joe Venezia</i>	
<b>Multi-Sensor Data Fusion of Landsat 5 TM VNIR and TIR Images</b> .....	177
<i>Nam-Ki Jeong, Hyung-Sup Jung</i>	
<b>Multispectral Image Segmentation of High Resolution Satellite Imagery Using Modified Mean Shift Algorithm</b> .....	178
<i>Imdad Ali Rizvi</i>	
<b>Neural Network Approach for Predicting TLS Measurement Error within Marshes</b> .....	179
<i>Chuyen T Nguyen, Michael J. Starek, Philippe Tissot</i>	
<b>A New Approach to Frame-based Imaging in Low Earth Orbit: A New Resource for Precision Geospatial Analytics</b> .....	180
<i>Jolyon Thurgood, Matt Sorgenfrei</i>	
<b>New Satellite Missions Provide Improved Methods for Pipeline Monitoring</b> .....	181
<i>Dennis Nazarenko</i>	
<b>Next Steps in Point Cloud Data Standards - An OGC Perspective</b> .....	182
<i>Scott Simmons</i>	
<b>Object-based Classifications of an Urban Estuary: Pre and Post Natural Disturbance</b> .....	183
<i>Anthony Campbell, Yeqiao Wang</i>	
<b>An Object-based Image Analysis Approach for Mapping Salt Marsh Habitats for the State of Rhode Island</b> .....	184
<i>Chris Robinson, Robin Weber, Eric Morris, Nate Herold, Kenny Raposa</i>	
<b>Object-Based Image Analysis</b> .....	185
<i>Jarlath O'Neil-Dunne, Keith Pelletier</i>	
<b>Oil Spill Monitoring in Eastern Straits - A Techno-Managerial Framework og GIS, GPS and RS Technologies</b> .....	186
<i>Murthy Remilla, Kishore Jandhyala</i>	
<b>On the recurrent Sargassum blooms in the Central Atlantic</b> .....	187
<i>Mengqiu Wang, Chuanmin Hu</i>	
<b>Online Tool for K-12 Using USGS Earthshots</b> .....	188
<i>Pia van Benthem</i>	
<b>OpenCL Based Bundle Adjustment for Large Terrestrial Data</b> .....	189
<i>Shaojun He, Ryan Lai</i>	
<b>Ozone and Fine Particulate Matter (PM2.5) Emission Trend (200-2014) And, Chronic Lower Respiratory Disease Mortality in Houston Galveston Area, Texas</b> .....	190
<i>Niaz Morshed</i>	
<b>Ozone Stress Detection Using Field Hyperspectral Spectroscopy and Plant Biophysical Variables of Several Plants Grown in Ozone Gardens</b> .....	191
<i>Guzelay Sataer, Abduwasit Ghulam, Matthew Maimaitiyiming, Arianna Bozzolo, Kelley Belina, Jack Fishman</i>	
<b>Park Dawgs</b> .....	192
<i>Wenjing Xu</i>	
<b>Performance Analysis of a Novel Algorithm for Large Scale Water-body Surface Mapping Using Elevation and Intensity of LiDAR Data</b> .....	193
<i>Partha P. Acharjee, George J. Toscano, Collin McCormick, Venkat Devarajan</i>	
<b>Performance Analysis of Motion Estimation of Taxiing Aircraft from LiDAR Point Clouds</b> .....	199
<i>Zoltan Koppanyi, Charles K. Toth</i>	
<b>Performance of Lifetime Statistics Derived Relative Gains for Landsat 8 OLI</b> .....	206
<i>Dennis Helder</i>	

<b>Photogrammetry based 3D Culvert Scanning System</b> .....	207
<i>Jinha Jung, Anjin Chang, Hoyoung Seo, Lawson D William</i>	
<b>Phytoforensics of Explosives: Using Plants to Locate Forgotten Landmines</b> .....	208
<i>Paul Vaughan Manley, Joel G Burken</i>	
<b>Pitfalls in Volume Measurement Using Photogrammetric Methods</b> .....	209
<i>Ben Vander Jagt, Omar E. Mora</i>	
<b>Pixel- and Object-based Classification of Wetlands Using Unmanned Air System Imagery</b> .....	210
<i>Amr Abd-Elrahman, Roshan Pande-chhetri, Tao Liu, Jon Morton, Victor Wilhelm</i>	
<b>Point Cloud Processing</b> .....	211
<i>Frank Obusek</i>	
<b>Point Clouds: More than a Picture, Much More than 1000 Words!</b> .....	212
<i>Frank Obusek, Joe Mostowy</i>	
<b>Portable LiDAR, VLP-16 Processing</b> .....	213
<i>Yushin Ahn, Kyung In Huh, Sudhagar Nagarajan, Jin Hong, Ki In Bang</i>	
<b>Pre-launch Calibration of the Planet Labs PlanetScope Constellation</b> .....	219
<i>Joseph Warga, William Krantz, Nicholas Konidaris</i>	
<b>Preparing for "what3words" as True Big Data Meets Unique Pixels - an NLCD Pixel Grid Index for Kentucky</b> .....	220
<i>Demetrio P. Zouarakis</i>	
<b>Principles of Remote Sensing and Mapping using Drones</b> .....	221
<i>Mike Tully</i>	
<b>Producing SGM Output from Multiple Image Sources</b> .....	222
<i>Frank Obusek, Joe Mostowy</i>	
<b>Quantifying Surface Reflectance Using a Low-Cost Camera System</b> .....	223
<i>Joseph Lehnert</i>	
<b>Quantitative Characterization of Within-leaf Spatial Variability of Narrow-band Vegetation Index Values for Rice Leaves</b> .....	224
<i>Eric J Guenther, Anthony M Filippi, Lee Tarpley, Burak Guneralp</i>	
<b>A Quantitative Comparison of Three Supervised Classification Training Methods for Optimizing Land Cover Accuracy</b> .....	225
<i>Francois Garriet Friedrich Smith, Mihir Datta, Jeffery Liedtke</i>	
<b>RadCalNet: A Prototype Radiometric Calibration Network for Earth Observing Imagers</b> .....	226
<i>Brian Wenny, Marc Bouvet, Kurtis Thome, Jeffrey Czapla-Myers, Nigel Fox, Philippe Goryl, Patrice Henry, Aimé Meygret, Chuanrong Li, Lingling Ma, Lingli Tang, Emma Woolliams</i>	
<b>Radiometric and Geometric Performance of Sentinel 2A (S2A) Multispectral Imager (MSI) Compared to Landsat 8 Operational Land Imager (OLI)</b> .....	227
<i>Jim Storey, Obaidul Haque, Michael Choate</i>	
<b>Radiometric Calibration of DigitalGlobe Sensors Using Automated In-situ Measurements</b> .....	228
<i>Kurtis Thome, Brian Wenny, Jeffrey Czapla-Myers</i>	
<b>Radiometric Calibration/Validation of the VIIRS Day-Night Band High Gain Stage Using Ground-based Artificial Light Sources</b> .....	229
<i>Robert Ryan, Mary Pagnutti, Kara Holekamp</i>	
<b>Raising the Bar on 3D Forensics</b> .....	230
<i>Eugene Liscio</i>	
<b>Random Forest Classification of Wetland Communities Using Geomorphometry, Quad-polarimetric SAR, Lidar and Optical Remote Sensing Data</b> .....	231
<i>Oumer Ahmed, Michael Stefanuk, Erik Skeries, Steven Franklin</i>	
<b>RASAT Satellite Data Geoportal and Image Processing Studies</b> .....	232
<i>Husne Seda Deveci, Ismail Tevriozoglu, Mustafa Teke, Ramazan Kupcu, A. Feray Oztopra, Can Demirkesen, Ibrahim Serdar Acikgoz, Ufuk Sakarya, Sevgi Zubeyde Gurbuz, Ismail Hakki Demirhan, Mehmet Efendioglu, Bulent Avenoglu</i>	
<b>Real Time, On Line Crop Monitoring and Analysis with Near Global Landsat-class Mosaics</b> .....	233
<i>Dmitry Varlyguin, Stephanie Hulina, Luke Roth, James Crutchfield, Curt Reynolds, Ronald Frantz</i>	
<b>Real-time Streaming Data on Penguin Abundance and Distribution Using Very High Spatial Resolution Satellite Imagery</b> .....	234
<i>Chandi Witharana, Heather J. Lynch</i>	
<b>Recent Glacier Recession in California</b> .....	235
<i>Pushkar Inamdar, Shrinidhi Ambinakudige</i>	
<b>Recent Progress in Single Photon Sensitive 3D Imaging Lidars</b> .....	245
<i>Marcos Sirota, John Degnan</i>	
<b>Reclaiming STEM Lost - Mining for 'Geo' in the Next Generation Science Standards</b> .....	246
<i>Demetrio P. Zouarakis</i>	
<b>Reconstruction of Effective Point-spread Functions (PSF) in Natural Satellite Images</b> .....	247
<i>Ignacio Zuleta</i>	
<b>Rectification of Opportunistic Low-altitude Airborne Imagery for Disasters (ROLAID)</b> .....	248
<i>Paul Pope</i>	
<b>Reducing the Size and Complexity of Full-Aperture Radiometric Calibrators on Thermal Imaging Satellites</b> .....	249
<i>Kurtis Thome, Brian Wenny, Jeffrey Czapla-Myers</i>	
<b>Remote Detection of Carbonatites in Regions of Sedimentary Carbonate Using an Index of Carbonate Ion Absorption Bands</b> .....	250
<i>Ethan Shavers, Abduwasit Ghulam, John Encarnacion</i>	



<b>Remote Sensing for Fish Habitat Assessment - An Example From the UK</b> .....	251
<i>David Campbell, Christian Newman</i>	
<b>Remote Sensing in Higher Education: The Impetus for Revisiting Content and Pedagogy</b> .....	252
<i>J.B. Sharma</i>	
<b>Riparian Areas Inventory Utilizing RBDM v3.1</b> .....	253
<i>Sinan Abood</i>	
<b>Riparian Vegetation Change (1972-2014) in the Okavango Delta, Botswana</b> .....	254
<i>Anastacia Makati</i>	
<b>RIT Tigers</b> .....	255
<i>Jonathan Kozak</i>	
<b>Satellite Imagery for Actual ET Estimation Using Surface Energy Balance Algorithm</b> .....	256
<i>M Azeem Khan, Claudio Stockle, Richard G. Allen, Ricardo Trezza</i>	
<b>Seasonal Vegetation Indices and Surface Temperature Correlation and Application in Modelling Drought Severity</b> .....	257
<i>Hoa Tran, James B. Campbell</i>	
<b>A Semi-automatic Method to Hydro-flatten LiDAR Data</b> .....	258
<i>Sagar S. Deshpande, Alper Yilmaz</i>	
<b>Simulating Multispectral Imagery using Spectral Band Synthesis Technique and Hyperspectral Datasets</b> .....	272
<i>Laura Lorena Trujillo, Henrique Momm, Justin Janaskie</i>	
<b>Slope-Based Terrain Filtering for Building Detection in Remotely Sensed VHR Images</b> .....	273
<i>Alaeldin Suliman, Yun Zhang, Raid Al-Tahir</i>	
<b>A Smarter, More Resilient City: Looking at Cities Through the Lens of Geospatial Data Analytics</b> .....	274
<i>Rick Gosalvez</i>	
<b>Solar Potential Map and Web Mapping Application for Iowa</b> .....	275
<i>John DeGroote, Jonathan Voss, Arif Masrur</i>	
<b>Space-Based Monitoring and Characterization of Active Geothermal Reservoirs</b> .....	276
<i>Mohamed Aly</i>	
<b>Spatial Quality by Edge target with KOMPSAT-3 &amp; KOMPSAT-3A</b> .....	277
<i>DongHan Lee, Dennis Helder, JaeHeon Jeong, DooChun Seo, HaeJin Choi, DaeSoon Park</i>	
<b>Spectral and Zonal Change Detection Workflows</b> .....	278
<i>Frank Obusek</i>	
<b>Standards for Disaster Mitigation and Response</b> .....	279
<i>Scott Simmons</i>	
<b>A Study on Oblique Camera Systems Calibration and the Stability of their Parameters</b> .....	280
<i>Ricardo Passini, Karsten Jacobsen, David Day, Wesley Weaver</i>	
<b>Studying Urbanization and Land Cover Land Use Change in Developing Countries: the Status, Causes and Impacts</b> .....	290
<i>Qiaofeng (Robin) Zhang</i>	
<b>A Summary of System Analyses at the USGS EROS</b> .....	291
<i>Ajit Sampath</i>	
<b>Supporting Rock-fall Risk Analysis of Cliff Faces by Terrestrial Laser Scanning and UAV Imagery</b> .....	292
<i>Tamás Lovas, Árpád Somogyi, Ákos Török, Zoltán Koppányi, Bence Molnár</i>	
<b>Surveying &amp; Georeferencing Historical Buildings using Laser Scanners</b> .....	297
<i>Luis Landaverde, Mohammed Algasem, Ahmed Elaksher</i>	
<b>SwathTRAK[trade] and Dynamic FOV Surveying: Lidar Innovation for High-Efficiency Mapping</b> .....	298
<i>Michael Sitar</i>	
<b>Synchronization Method for Low-Cost UAV 3D Mapping System</b> .....	299
<i>Magdy Elbahnasawy, Tamer Shamseldin, Aymen Habib</i>	
<b>Teledyne's Multi-User System for Earth Sensing (MUSES)</b> .....	300
<i>William Ray Perkins, Rupert Mueller, David Krutz, Emiliano Carmona, Robert E. Griffin, Lewis Graham, Randy Miller</i>	
<b>Teledyne's Multi-User System for Earth Sensing (MUSES)</b> .....	301
<i>Ray Perkins</i>	
<b>Terrestrial Laser Scanning to Support Carbon Estimation in Nature Conservation Area: A case Study of Haagse Bos and Snippert Forest, Netherlands</b> .....	302
<i>Rifky Primasatya, Yousif Hussin, Louise van Leeuwen</i>	
<b>The Advantages of Using Mobile Lidar Over Other Platforms for Transportation Projects</b> .....	303
<i>Tyler Stentz</i>	
<b>The Application of an Unmanned Aerial Vehicle for Acquiring High Resolution 3D Data of Saltation Features in the Buda and Devil's River Limestone</b> .....	304
<i>Arlo McKee, Lionel S. White, Charles D. Frederick</i>	
<b>The Generic Frame-Sequence Model</b> .....	305
<i>Henry J. Theiss, John T. Dolloff, Aaron W. Braun</i>	
<b>The Geometric Quality of the Ortho Product Made by Google</b> .....	326
<i>Byron Smiley</i>	
<b>The Move Toward Analysis Ready Data and the Opportunities/Challenges Ahead</b> .....	327
<i>Thomas Cecere</i>	
<b>The Use of High Density Filtered LiDAR and Optically Derived Land Use Information in Modeling Surface Water Quality: The Case of a Metropolitan Catchment</b> .....	328
<i>Cyril Wilson</i>	

<b>The Use of LiDAR and Geospatial Modeling for Trail Design Automation</b> .....	329
<i>Peter Sawall, Cyril Wilson</i>	
<b>Three Dimensional Urban Building Detection Using Lidar Data</b> .....	330
<i>Indu Indira Bai, Rama Rao Nidamanuri</i>	
<b>U.S. Geological Survey Elevation-Hydrography Breakline Specifications</b> .....	340
<i>Christy-Ann Archuleta, Hans Karl Heidemann, Silvia Terziotti, Kristina Yamamoto</i>	
<b>UAS-Derived Crop Height and NDVI Measure of Sorghum Yield</b> .....	341
<i>Carly Stanton, Michael Starek, Michael Brewer, Keith Fuhrmann</i>	
<b>UAV-based Dense Reconstruction for Agriculture Applications</b> .....	342
<i>Fangning He, Ayman Habib</i>	
<b>UltraCam Aerial Sensor Calibration and Validation</b> .....	343
<i>Michael Gruber, Marc Muick</i>	
<b>Uncertainty Analysis for the Radiometric Calibration Test Site (RadCaTS) at Railroad Valley, Nevada</b> .....	344
<i>Jeffrey Czapl-Myers, Kurt Thome, Tracy Scanlon, Emma Woolliams, Andrew Banks, Arta Dilo, Brian Wenny</i>	
<b>Unmanned Aerial Systems in the Oil &amp; Gas Industry</b> .....	345
<i>Keith Cunningham</i>	
<b>An Update on Spaceborne Remote Sensing</b> .....	346
<i>Jon Christopherson</i>	
<b>Update on UltraCam Aerial Sensor Technology</b> .....	347
<i>Michael Gruber, Alexander Wiechert</i>	
<b>Updates on the USGS NGP Lidar Base Specification</b> .....	348
<i>Hans Karl Heidemann</i>	
<b>Urban Tree Structure Parameter Retrieval from Aerial Stereo Imaging, LiDAR, InSAR and Polarimetric InSAR</b> .....	349
<i>Sean Hartling, Abduwasit Ghulam, Benjamin Bira, Bethany Marshall, Joshua Carron, Guzelay Sataer</i>	
<b>Use of Automated In-situ Measurements for Sensor Harmonization</b> .....	350
<i>Kurtis Thome, Brian Wenny, Jeffrey Czapl-Myers</i>	
<b>Using Spectroscopy Remote Sensing to Assess Stress Factors of Vegetation Water Content on Black Needlerush in the Florida Everglades</b> .....	351
<i>Donna Selch, Caiyun Zhang</i>	
<b>Using UAS with Consumer Cameras for Sub-Centimeter Survey Point Measurements</b> .....	352
<i>Richard David Day</i>	
<b>Utilizing Cloud Computing for Geospatial Applications</b> .....	353
<i>Benjamin Vander Jagt</i>	
<b>Validating Percent Impervious Surface Cover Estimates from Landsat-based Land Cover Data</b> .....	391
<i>Jason Parent</i>	
<b>Veracity of Structured and Unstructured Big Data - A Case Study of Emergency Management</b> .....	392
<i>Bandana Kar, ZhiQiang Chen</i>	
<b>Vertical Accuracy Assessment of Image-Based Reconstructed 3D Point Clouds with Respect to Horizontal Ground Sampling Distance</b> .....	393
<i>Farid Javadnejad, Matthew Gillins, Daniel Gillins</i>	
<b>Virtual Surveyor: An In-situ Surveyor Based Segmentation to Delineate Landforms from Airborne LiDAR Returns</b> .....	394
<i>Ahsan Habib, Venkat Devarajan</i>	
<b>What You May Not Realize About the Free Landsat Imagery Available From the EROS Data Center May Hurt Your Project</b> .....	399
<i>Kenneth Stumpf</i>	
<b>WorldDEM: The New Global Elevation Solution - Data Acquisition, Processing and Use-Cases</b> .....	400
<i>John Collins</i>	
<b>WorldView-3 Geolocation Accuracy and Band Co-Registration Analysis</b> .....	427
<i>Paul Bresnahan, Robert J. Powers, Luiz Henry Vazquez</i>	
<b>WorldView-3 SWIR Instrument Performance and Applications</b> .....	428
<i>Chris Comp</i>	
<b>8 Critical Skills You Need to be a Successful GIS Professional</b> .....	429
<i>Chris Akin</i>	
<b>Calibrating Film and Digital Sensors for Today's Remote Sensing Business</b> .....	430
<i>Qassim A. Abdullah, Riadh Munjy</i>	
<b>Object-Based Image Analysis Approach for Extraction of Urban Tree Canopy</b> .....	431
<i>Imdad Rizvi</i>	
<b>Preparation for ASPRS Certification</b> .....	433
<i>Robert Burtch</i>	
<b>Remote Sensing of Vegetation</b> .....	434
<i>Charles E. Olson</i>	
<b>Remote Sensing Using ArcGIS 10.x</b> .....	435
<i>Tammy E. Parece</i>	
<b>Recent Advances in InSAR</b> .....	436
<i>Abduwasiti Wulamu</i>	
<b>Empowering 3D GIS from Drone Imagery and Lidar</b> .....	437
<i>Steve Snow, Kurt Schwoppe, Lawrie Jordan, Mark Cygan</i>	
<b>Automated Aerial Triangulation, Digital Surface Model Extraction and Orthophoto Mosaic Production</b> .....	438
<i>Frank Scarpace</i>	

<b>A Comparative Analysis of EO-1 Hyperion, Worldview-2 and Worldview-3 Imagery for Saltmarsh Mapping in Hunter Wetland National Park, Australia</b> .....	439
<i>Sikdar Mohammad Marnes Rasel</i>	
<b>Earth's Landscape Features: Identification and Change Analysis through Remote Sensing</b> .....	440
<i>Rebecca Dodge</i>	
<b>Enhanced Disparity Maps from Multi-View Satellite Images</b> .....	441
<i>Alaeldin Suliman, Yun Zhang, Raid Al-Tahir</i>	
<b>Aerial and Ground Data Collection for Precision Agriculture</b> .....	442
<i>Mustafa Teke, Husne Seda Deveci, Cna Demirkesen, Ayse Feray Oztoprak, Mehmet Efendioglu, Ramazan Kupcu, Fatih Fehmi Simsek, Bilge Bagci, Ufuk Turker, Yusuf Ersoy Yildirim, Ilhami Bayramin</i>	
<b>Workshop Title: UAV Data Georeferencing: State-of-the-Art and New Trends</b> .....	443
<i>Joseph Hutton, Mohamed Mostafa</i>	
<b>The 6th Annual ASPRS SAC GeoLeague Challenge</b> .....	444
<i>Caren Remillard, Amanda Aragon</i>	
<b>The Acquisition, Assembly, and Display of High Resolution PhotoRealistic Models of Geological Outcrops Using Terrestrial LiDAR and DSLR Cameras with Case Histories from Saudi Arabia and West Texas</b> .....	445
<i>Lionel White, Mohammed Alfarhan, Jarvis Cluine, Carlos Aiken</i>	
<b>Analysis and Monitoring of the Urban Landscape using Sentinel-1 Imagery</b> .....	446
<i>Fubara George Warmate, Chris Rizos, John Trinder</i>	
<b>Assessment of Pan Sharpening Algorithm for Mapping Mangroves Ecosystem by Incorporating Object Based Image Analysis</b> .....	447
<i>Naeem Shahzad, Sajid Rashid Ahmad</i>	
<b>Photogrammetric Processing: Surface Model and Orthophotography Workshop</b> .....	448
<i>Jennifer Nix, Jon Proctor</i>	
<b>Gezgin: Turkey's First National Satellite Data Sharing Platform</b> .....	566
<i>Husne Seda Deveci, Ismail Tevriozoglu, Mustafa Teke, Ramazan Kupcu, A. Feray Oztoprak, Can Demirkesen, Ibrahim Serdar Acikgoz, Ufuk Sakarya, Sevgi Zubeyde Gurbuz, Ismail Hakki Demirhan, Mehmet Efendioglu, Bulent Avenoglu</i>	
<b>Empowering 2D &amp; 3D GIS from Drone Imagery and Lidar</b> .....	567
<i>Sean William Morish, Steve Snow, Mark Romero</i>	
<b>Small Unmanned Aerial Systems (SUAS) Operations</b> .....	568
<i>Edwin Freeborn, Dave Prall</i>	
<b>People, Planet, Profit and Parking</b> .....	569
<i>Joel Alan Feik</i>	
<b>Object-Based Change Detection for Time-Series SAR Data Stack</b> .....	570
<i>Keng-Fan Lin, Daniele Perissin</i>	
<b>Detecting Street Lights by Depth Imagery</b> .....	571
<i>Bence Molnar, Arpad Barsi, Tamas Lovas, Arpad Jozsef Somogyi</i>	
<b>Application of Small Unmanned Systems (sUAS) for Monitoring Impaired and Restored Louisiana Barrier Islands</b> .....	572
<i>Frank Yrle, Balaji Ramachandran, Gary LaFleur</i>	
<b>Accuracy of Measuring Tree Height Using Airborne LiDAR and Terrestrial Laser Scanner and Its effect on Estimating Forest Biomass and Carbon Stock in Ayer Hitam Tropical Rain Forest, Malaysia</b> .....	573
<i>Ojoatre Sadadi, Yousif Hussin, Henk Kloosterman</i>	
<b>Camera Pose Estimation for Mobile Localization Using Building Information Models and a Single View Image of a Scene</b> .....	574
<i>Phillip Robbins, Gunho Sohn</i>	
<b>Making Drones Work for You!</b> .....	575
<i>Edwin Freeborn, Dave Prall</i>	
<b>Application of Lipschitz Regularity and Multiscale Techniques for the Automatic Detection of Oil Spills in Synthetic Aperture Radar Imagery</b> .....	576
<i>Olaniyi Ajadi, Franz Meyer, Marivi Tello</i>	
<b>Part 2 Empowering 2D &amp; 3D GIS from Drone Imagery and Lidar</b> .....	577
<i>Sean William Moorish, Steve Snow</i>	
<b>Forecasting of Rainfall Under Rainfed Agriculture of Pakistan</b> .....	578
<i>Mukhtar Ahmed, Fayyaz Ul Hassan</i>	
<b>16.006 Radiometric Calibration of the Planet Labs PlanetScope Constellation</b> .....	579
<i>Jennifer Kyle, Alan Collison, Arin Jumpasut, Aaron Lee, Ashish Shrestha</i>	
<b>16.031 A 1st Principles Approach for Absolute Radiometric Calibration Using Pseudo Invariant Calibration Sites</b> .....	580
<i>Dennis Helder</i>	
<b>16.034 Application and Evaluation of Different Topographic Correction Models for Landsat-8 OLI Images</b> .....	581
<i>Sung-Hwan Park, Hyung-sup Jung</i>	
<b>Author Index</b>	