



# SPECTRUM SOLUTIONS

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## ANDROID 2017-2018

S.NO	TITLE	YEAR	ABSTRACT
1.	Performance Modeling of Cloud Apps Using Message Queuing as a Service (MaaS)	2017	This paper presents an analytical model to study the performance of cloud applications using message queuing as a service (MaaS). MaaS is a cloud service which allows the development departments to focus on delivering business and computing applications without being concerned with the underlying message queuing infrastructure to be scalable, secure, and reliable. Estimating the service delay (prior to provisioning cloud resources) of this type of cloud apps is an important engineering and resource management problem. Such estimation would help in computing the overall network and service delay that users experience. In a way, cloud providers would allocate the appropriate capacity for the needed cloud resources to meet the Service Level Agreement (SLA) parameters. In this paper, we present an analytical model by using Markov chain to study the performance of cloud apps which use MaaS. Given the expected request arrival rate, the queue size, and the expected service rate of each processing stage of the cloud app, our analytical model can estimate the app performance in terms of key SLA parameters which include response time, throughput, and request loss. In addition, our model yields equations for other key performance measures which include system idleness and utilization, queuing delay, and system and queue occupancies. Our analytical model is verified and validated by using discrete-event simulation and experimental measurements taken from an experiment conducted on AWS (Amazon Web Services) cloud.
2.	Integration of Ant Colony Optimization and Object-Based Analysis for LiDAR Data Classification	2017	Light detection and ranging (LiDAR) data classification provides useful thematic maps for numerous geospatial applications. Several methods and algorithms have been proposed recently for LiDAR data classification. Most studies focused on object-based analysis because of its advantages over per-



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		<p>pixelbased methods. However, several issues, such as parameter optimization, attribute selection, and development of transferable rulesets, remain challenging in this topic. This study contributes to LiDAR data classification by developing an approach that integrates ant colony optimization (ACO) and rule-based classification. First, LiDAR-derived digital elevation and digital surface models were integrated with high-resolution orthophotos. Second, the processed raster was segmented with the multiresolution segmentation method. Subsequently, the parameters were optimized with a supervised technique based on fuzzy analysis. A total of 20 attributes were selected based on general knowledge on the study area and LiDAR data; the best subset containing 12 attributes was then selected via ACO. These attributes were utilized to develop rulesets through the use of a decision tree algorithm, and a thematic map was generated for the study area. Results revealed the robustness of the proposed method, which has an overall accuracy of ~95% and a kappa coefficient of 0.94. The rule-based approach with all attributes and the k nearest neighbor (KNN) classification method were applied to validate the results of the proposed method. The overall accuracy of the rule-based method with all attributes was ~88% (kappa = 0.82), whereas the KNN method had an overall accuracy of &lt;70% and produced a poor thematic map. The selection of the ACO algorithm was justified through a comparison with three well-known feature selection methods. On the other hand, the transferability of the developed rules was evaluated by using a second LiDAR dataset at another study area. The overall accuracy and the kappa index for the second study area were 92% and 0.90, respectively. Overall, the findings indicate that the selection of a subset with significant attributes is important for accurate LiDAR data classification with</p>
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			object-based methods.
3.	A Multiple-Voting-Based Decoding Algorithm for Nonbinary LDPC-Coded Modulation Systems	2017	We propose a multiple-voting-based joint detection-decoding algorithm for nonbinary low-density parity-check (LDPC)-coded modulation systems. This algorithm is inspired from the reliability-based JDD algorithm for nonbinary LDPC-coded modulation systems, that has been proposed recently, in which the accumulated reliability of symbols based on one-step majority-logic decoding algorithm and the Chase-like local list decoding algorithm are used. However, the reliability-based JDD algorithm still has a significant performance degradation of at least 1 dB with low column weight ( $d_v = 4$ ). In order to reduce the performance degradation with low column weight, the proposed algorithm allows unbounded number of variable nodes to pass two symbols to the associated check node, in contrast with the reliability-based JDD algorithm, which allows only one variable node to pass two symbols to check node, when updating variable-to-check messages. Moreover, the votes are weighted differently according to the components of the list in the check-sum computation. Simulations show that the proposed algorithm yields better performance with low column weight, while still maintaining the low complexity feature.
4.	Thai Finger-Spelling Sign Language Recognition Using Global and Local Features with SVM	2017	This paper presents a finger-spelling recognition system focusing on Thai finger-spelling sign language, derived from the computer vision, using SVM. In this study, global and local features were extracted from input finger images. In order to develop the recognition system, 15 Thai alphabet characters were collected from five hand signers, totally 375 character pictures, in order to train the system using the SVM technique; with linear, polynomial, RBF, and sigmoid kernels. Each kernel method employed three feature vectors extracted from global features, local features, and the combination of both features; and were



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			measured for performance in 4 SVM kernels, with five-fold crossvalidation. The experimental results demonstrated that the combination of global and local features applied in RBF, linear, polynomial, and sigmoid resulted in the average accuracies of 91.20%, 86.40%, 80.00%, and 54.67%, respectively. The RBF method with the combination of global and local features provided the highest accuracy among all combinations.
5.	Visualizing Anomalous Activity in the Movement of Critical Infrastructure Employees	2017	The paper presents an approach to the movement analysis of the employees of critical infrastructure based on combination of data-mining and visualizations techniques. It consists of two stages – finding groups of employees with similar behavior and detection of the anomalies. The groups of similarities are defined using Kohonen self-organizing map (SOM); spatiotemporal patterns of the behavior are presented using stacking based visualization technique named Band View. To detect anomalies in employees' behavior, we propose a mechanism for rating deviations from a normal behavior according to its temporal and spatial attributes, i.e. we consider when, where, how long and how often it took place. The rating mechanism is fully controlled by the analyst and allows filtering out insignificant deviations and highlighting suspicious ones. The rated deviations are displayed using interactive heat map that allows analyst to spot zones and time intervals with suspicious activity easily. We present results of the application of the approach proposed to the VAST MiniChallenge-2 2016 data set describing employees' movement within organization building.
6.	Video Anomaly Detection With Compact Feature Sets for Online Performance	2017	Over the past decade, video anomaly detection has been explored with remarkable results. However, research on methodologies suitable for online performance is still very limited. In this paper, we present an online framework for video anomaly detection. The key aspect of our framework is a



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			<p>compact set of highly descriptive features, which is extracted from a novel cell structure that helps to define support regions in a coarse-to-fine fashion. Based on the scene's activity, only a limited number of support regions are processed, thus limiting the size of the feature set. Specifically, we use foreground occupancy and optical flow features. The framework uses an inference mechanism that evaluates the compact feature set via Gaussian Mixture Models, Markov Chains, and Bag-of-Words in order to detect abnormal events. Our framework also considers the joint response of the models in the local spatio-temporal neighborhood to increase detection accuracy. We test our framework on popular existing data sets and on a new data set comprising a wide variety of realistic videos captured by surveillance cameras. This particular data set includes surveillance videos depicting criminal activities, car accidents, and other dangerous situations. Evaluation results show that our framework outperforms other online methods and attains a very competitive detection performance compared with state-of-the-art non-online methods.</p>
7.	A Smartphone Application for Location Recording and Rescue Request Using Twitter	2017	<p>A prototype of an Android smartphone application named "T-support" is presented in this study. This application enables supported users (elderly, handicapped people, or children) who needs daily support to share their location coordinates via Twitter. Supporting users (families, neighbors, or relatives of the supported user) can then check the location coordinates of the supported users when required. In addition, the supported users can use this application to easily send a rescue request on Twitter when needed.</p>
8.	Empowering vehicle tracking in a cluttered environment with adaptive cellular automata	2017	<p>Detecting and tracking moving vehicles in actual traffic scenes is an embryonic investigation field for smart transportation systems. This study presents the computational paradigm of fuzzy cellular automata</p>



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	suitable to intelligent transportation systems		(FCA) to manage the sensitive to environmental fluctuations limitation associated with the background subtraction methods for dynamic vehicle tracking. The suggested model extends FCA that is formed with rules supporting least sensitive fuzzy 'exclusive or' operation as next case logic to control levels of ambiguity in rule similarly functions. At each step, the refresh of background in frame difference proposals is established according to the number of active cells and fuzzy mapping function; so moving vehicles that their grey level is totally similar to the background grey level are easily identified. Furthermore, an occlusion handling routine based on visual measurement is engaged in discovering the classes of the vehicle occlusions and fragmenting the vehicle from each occlusive class. The empirical outcomes confirm that the suggested method is more accurate and powerful than conventional techniques for real-time vehicle tracking.
9.	Cooperative Simultaneous Localization and Mapping by Exploiting Multipath Propagation	2017	An affordable and reliable indoor positioning is a highly needed service. Moreover, maps of the indoor environment are vital to many applications. In this paper, a method for joint localization and mapping using multipath delay estimates is developed. Required high-resolution estimates of multipath delays may be obtained using radio frequency or acoustic measurements among a set of nodes in a network. In this paper, the problem is modeled in two-dimensional space with arbitrary node configuration and assuming a convex polygonal room shape. Joint localization and mapping is formulated as an optimization problem. It is subdivided and relaxed into two convex subproblems, which can be solved in an alternating manner. A method for data association and a low-complexity mapping algorithm stemming from Hough transform are proposed. Both the estimation performance and identifiability of the indoor localization problem are improved. Moreover,



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			a basic map of the propagation environment is produced.
10.	Cluster based Zoning of Crime Info	2017	<p>The criminal behavior is a disorderliness that is a combined result of social and economic aspects. The crime rate has expanded and the activities of criminals have broadened in last few decades due to better communication system and transport. Crimes cause terror and damage our community enormously in several means. In cities and towns the crime trends rise due to fast developmental activities and increase in population. In India, the regional location has a powerful impact on criminal activity. The CrimeInfo report of National Crime Records Bureau (NCRB), India collects, analyzes and publishes the crime data. The crime profiling and zoning can be modeled with utilization of data mining. In this paper, we make cluster analysis by using k-means cluster algorithm on criminal dataset of India. The cluster input is used to create custom India map with the cluster zones of states. The custom maps display an overall crime profile of states which helps police and law enforcement department to take additional preventive measures to combat against the crime and plan advanced investigation strategies. The crime trend and zoning knowledge can also be helpful in cautioning police to increments and reductions in levels of actions.</p>
11.	Fast Phrase Search for Encrypted Cloud Storage	2017	<p>Cloud computing has generated much interest in the research community in recent years for its many advantages, but has also raised security and privacy concerns. The storage and access of confidential documents have been identified as one of the central problems in the area. In particular, many researchers investigated solutions to search over encrypted documents stored on remote cloud servers. While many schemes have been proposed to perform conjunctive keyword search, less attention has been noted on more specialized searching techniques. In</p>



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			<p>this paper, we present a phrase search technique based on Bloom filters that is significantly faster than existing solutions, with similar or better storage and communication cost. Our technique uses a series of n-gram filters to support the functionality. The scheme exhibits a trade-off between storage and false positive rate, and is adaptable to defend against inclusion-relation attacks. A design approach based on an application's target false positive rate is also described.</p>
12.	ShakeIn: Secure User Authentication of Smartphones with Habitual Single-handed Shakes		<p>Smartphones have been widely used with a vast array of sensitive and private information stored on these devices. To secure such information from being leaked, user authentication schemes are necessary. Current password/pattern-based user authentication schemes are vulnerable to shoulder surfing attacks and smudge attacks. In contrast, stroke/gait-based schemes are secure but inconvenient for users to input. In this paper, we propose ShakeIn, a handy user authentication scheme for secure unlocking of a smartphone by simply shaking the phone. With embedded motion sensors, ShakeIn can effectively capture the unique and reliable biometrical features of users about how they shake. In this way, even if an attacker sees a user shaking his/her phone, the attacker can hardly reproduce the same behaviour. Furthermore, by allowing users to customise the way how they shake the phone, ShakeIn endows users with the maximum operation flexibility. We implement ShakeIn and conduct both intensive trace-driven simulations and real experiments on 20 volunteers with about 530; 555 shaking samples collected over multiple months. The results show that ShakeIn achieves an average equal error rate of 1:2% with a small number of shakes using only 35 training samples even in the presence of shoulder-surfing attacks.</p>
13.	RoadSense: Smartphone Application		Monitoring the road condition has acquired a critical



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	to Estimate Road Conditions using Accelerometer and Gyroscope		significance during recent years. There are different reasons behind broadening research on this field: to start with, it will guarantee safety and comfort to different road users; second, smooth streets will cause less damage to the car. Our motivation is to create a real-time Android Application RoadSense that automatically predicts the quality of the road based on tri-axial accelerometer and gyroscope, show the road location trace on a geographic map using GPS and save all recorded workout entries. C4.5 Decision tree classifier is applied on training data to classify road segments and to build our model. Our experimental results show consistent accuracy of 98.6%. Using this approach, we expect to visualize a road quality map of a selected region. Hence, we can provide constructive feedback to drivers and local authorities. Besides, Road Manager can benefit from this system to evaluate the state of their road network and make a checkup on road construction projects, whether they meet or not the required quality.
14.	DrivingStyles: A Mobile Platform for Driving Styles and Fuel Consumption Characterization		Intelligent transportation systems (ITS) rely on connected vehicle applications to address real-world problems. Research is currently being conducted to support safety, mobility and environmental applications. This paper presents the DrivingStyles architecture, which adopts data mining techniques and neural networks to analyze and generate a classification of driving styles and fuel consumption based on driver characterization. In particular, we have implemented an algorithm that is able to characterize the degree of aggressiveness of each driver. We have also developed a methodology to calculate, in real-time, the consumption and environmental impact of spark ignition and diesel vehicles from a set of variables obtained from the vehicle's electronic control unit (ECU). In this paper, we demonstrate the impact of the driving style on



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## **ANDROID 2017-2018**

			<p>fuel consumption, as well as its correlation with the greenhouse gas emissions generated by each vehicle. Overall, our platform is able to assist drivers in correcting their bad driving habits, while offering helpful tips to improve fuel economy and driving safety.</p>
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