Editorial

Lorna Uden

School of Computing,
Faculty of Computing and Digital Technologies,
Staffordshire University,
Mellor Building, College Road, Stoke-on-Trent, ST4 2DE, UK
Email: L.uden@staffs.ac.uk

Welcome to V15N1 issue. This issue consists of five papers. The first paper is 'A model-driven approach for the verification of an adaptive service composition', by Sara Zatout, Mahmoud Boufaida, Maya Souilah Benabdelhafid and Mohamed Lamine Berkane. These authors argue that the development of web service compositions is a complex task that needs coherent mechanisms in order to maintain the quality of the provided business process and to satisfy user needs.

They presented a modelling and verification process based on MDA technique for the specification of service orchestration and different performance attributes. The approach considers not only the specification and implementation of composite services but also their verification and adaptation at both design and run time phases. The verification step is included in these two phases in order to ensure the reliability of the developed composition and to adapt composition during its execution. These authors used the TCPN formalism and the ASK-CTL logic for verifying the reliability of orchestration models behaviour. They considered the simulation of specified performance attributes by using monitors available in CPN Tools software. In addition, they also verified the reliability and performance aspects at the run time phase using the access/CPN middleware that allows the use of CPN Tools simulator during execution in order to perform several simulations for reasoning about adaptation decisions. They used an example of an identity card management process to prove the feasibility of the proposed solution. More empirical studies are needed to verify the results.

The second paper is 'The research on two phase pickup vehicle routing based on the K-means++ and genetic algorithms' by Huan Zhao and Yiping Yang. According to these authors, the daily logistics operations involve two stages, pickup and delivery. The first stage usually involves vehicles picking up goods from several suppliers and delivering them to one or more distribution centres. The second stage refers to the delivery of goods to one or multiple customers from the distribution centre or the cooperative suppliers. In this study, the focus is on the delivery stage of the goods, i.e., the stage in which the goods are shipped to the distribution centre from multiple suppliers.

This paper presents a model for vehicle routing problem with a time window and static network considering the vehicle type, type of goods, and customer satisfaction requirements to build an optimisation model. These authors argue that by optimising using the combination of the K-means++ and genetic algorithms, the problem is transformed into a two-stage solution. The supplier clustering is performed using the K-means++ algorithm, and the vehicle path is determined using the genetic algorithm in each cluster arrangement. They compared the optimisation results with the actual delivery

data. These authors argue that that the optimisation results were superior to the current vehicle arrangement in terms of vehicle utilisation and cost. More empirical studies are required to validate the results.

The third paper is 'Short text classification using feature enrichment from credible texts', by Issa M. Alsmadi and Keng Hoon Gan. Although tweets are considered valuable resources for various practical applications. The limited number of words available in each post leads to poor classification performance. According to these authors, one popular technique that is used to address short text classification problem is through the expansion of keywords.

In this study, the authors introduced a method for enriching tweets' contents with terms that are extracted from external sources, such as web pages. The proposed method expands the class data by appending the set of terms selected from the associated web pages to resolve the semantic gap in tweets and the sparseness problem. For evaluation, they conducted experiments on two twitter datasets using four standard classifiers, namely, support vector machine, decision tree, K-nearest neighbour and logistic regression. According to them, results show that the accuracy rate of enriched tweets contents is better than the original contents (without term enrichment) for all weighing schemes used in the experiments. These authors argue that their proposed approach has enhanced the performance of the classification task, with improvements in accuracy ranging from +0.70% to +3.54% for the Sanders dataset and from +0.05% to +3.29% for the self-collected trending topic dataset. The datasets used are limited. More experiments are needed to validate the effectiveness of this approach.

The fourth paper is 'Improvement of TCP Vegas algorithm based on forward direction delay' by Shijie Guan, Yueqiu Jiang and Qixue Guan, according to these authors, satellite networks transmit data through the space communications protocol specification transport protocol and uses transmission control protocol (TCP) Vegas as the congestion control algorithm. However, TCP Vegas is not suitable for the asymmetric bandwidth of satellite networks, because the reverse link of asymmetric bandwidth frequently causes congestion in satellite networks. The solution is to reduce the congestion window with occurrence of reverse link congestion, thereby simultaneously reducing the forward link throughput of the satellite network.

This paper presents a modified congestion control algorithm called Vegas_FDD based on the traditional TCP Vegas and Reno algorithms to enhance communication efficiency under the condition of bandwidth asymmetry in satellite networks. The proposed algorithm controls the sending end of the congestion window size by measuring the forward delay segment rather than the segment round-trip delay to avoid congestion and reduce the forward link transmission speed caused by the reverse link. The simulation and result analysis obtained using Opnet software shows that the proposed Vegas_FDD algorithm performs better compared to the TCP Vegas and TCP Reno algorithms in terms of cwnd, data throughput, network delay, and other aspects under the condition of ber $= 10^{-5}$, thereby verifying the validity of the algorithm. However, the differences between the three algorithms gradually decrease with the decrease in error rate. Future research should focus on designing a general congestion control algorithm with all the characteristics of a satellite network.

The last paper is 'A secure VM allocation scheme to preserve against co-resident threat' by Sakshi Chhabra and Ashutosh Kumar Singh. These authors argue that preserving the secrecy in cloud system is one of the biggest concerns for the cloud customers who face security risks in the context of load balancing of virtual machines

(VMs). The co-resident attacks are widely used by attackers, where malicious users build side channels and extract private information from VMs that are co-located on the same server. These authors present a model to evaluate the possibility of VM co-residency and success rate of an attack.

The main purpose of the model is to mitigate the threats by minimising the probability of attackers co-locating with the targets. According to these authors, the model significantly improves the security by reducing the shared servers up to 32.2% and enhances the resource utilisation up to 44.14% over least virtual machine allocation policy (LVMP), round robin virtual machine allocation policy (RRVMP) allocation schemes. Further research and empirical studies must be carried out to validate the proposed model.