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Editorial

CIT's September 2016 issue brings seven papers whose topics fall in the broader areas of computer networks, distributed computing and query languages. Three networking papers address topics related to Mobile Ad Hoc Networks (MANETs), while three other ones, from the area of distributed computing, focus on particular distributed processing manifestations. The last paper, on query languages, focuses on a novel approach to object-oriented querying.

The paper *A Novel Load Balancing Scheme for Multi Path Routing Protocol in MANET* by Kokilamani Mounagurusamy and Karthikeyan Eswaramurthy addresses a known issue of a multipath routing protocol widely used in MANETs. Namely, as congestion development is inherent to MANET's organization, the probability of nodes disconnection or network partitioning because of battery depletion is a real situation which has to be coped with. The main objective is then to both balance the load on a node and to extend its lifetime with respect to congestion, energy depletion and link failures. The authors try to solve the congestion issue caused by multi-path routing protocols by introducing a threshold value and a counter variable in order to limit the number of communication paths passing over a node in the route discovery phase. Simulation results provided show that their method exhibits a significant improvement over similar approaches.

In their paper *A New QoS-Aware Routing Protocol for MANET Using Artificial Neural Network*, Prakash Srivastava and Rakesh Kumar present another routing procedure to provide efficient QoS in MANETs, which minimizes end-to-end delay and is appropriate for supporting delay sensitive applications. Routing protocols in MANETs are designed to compute best routes, including route recovery because of link failures, by estimating path delays. The novel routing procedure described in the paper is based on the use of neural networks to predict end-to-end delays and link failures, thus identifying optimal paths. The proposed approach has been validated through computer simulations, showing that it outperforms existing approaches and has the potential to be applied in real world scenarios.

A practical methodology to address the issue of malicious nodes in MANETs is tackled by Rutuja Shah, Sumathy Subramaniam and Dhinesh Babu Lekala Dasarathan in their paper *Mitigating Malicious Attacks Using Trust Based Secure-BEFORE Routing Strategy in Mobile Ad Hoc Networks*. Since in mobile ad hoc networks the emphasis is on node mobility, the issue of malicious or suspicious nodes' participation is quite challenging, which leads to serious performance degradation when enforcing security checks. The authors propose another approach that targets mitigating malicious attacks without overly affecting the overall network performance. Their proposed Secure-BEFORE (BEst FOrwarding Route Estimation) routing method addresses the issue at one hop level towards the destination to ensure optimal route estimation.

Dependency relationships in the context of Service Oriented Architectures (SOA) refer to relationships that a software being developed has with other reusable software services upon which it builds. In their paper *Dependency Modeling of a SOA Based System Through Coloured Petri Nets*, Pawan Kumar and Ratneshwer Gupta provide a formal modeling of SOA dependencies based on the formalisms of Colored Petri Net and Service Algebra. As a case study, the authors developed a module SOA based system *Online Bookshop*, which is afterwards used for modeling and example demonstration. In comparison to other cited approaches, they indicate a number of advantages their approach possesses.

Yin Li, Zhi-an Sun and Jian-Yong Fang elaborate on Web Services testing as an important means of assuring the quality of Web applications in their paper titled *Generating an Automated Test Suite by*

Variable Strength Combinatorial Testing for Web Services. Claiming that existing testing methods may lead to both test suite redundancy and fault-detecting ability decrease, they have developed an automated test suite generator based on combinatorial testing and data constraints rules, in order to obtain optimal test cases for a single Web Service operation. Their approach consists of a formal tree model based on WSDL, a variable strength combinatorial model, and a test case generation through one-test-at-a-time. The approach is corroborated by a case study of ship command and control system based on a Service Oriented Architecture. In comparison to conventional random testing, results provided show that the above approach detects more errors with the same amount of test cases.

As its title says, the paper *A Review on Broker Based Cloud Service Model* by Rajganesh Nagarajan and Ramkumar Thirunavukarasu, brings a review of a class of cloud provided services. Cloud computing offers a number of service models to Internet users, but there always exists the possibility of unsuitable service delivery in spite of clearly stated requirements, which prompts the development of an intermediate service layer bridging both parties for effective service consumption/delivery. The cloud broker incorporated in this layer then enhances the functionality of cloud services. The paper provides a detailed literature survey along with the description of the above mentioned broker based cloud service model.

The last paper of the issue is titled *An Object-Oriented Approach of Keyword Querying over Fuzzy XML*. The author, Ting Li, tackles keyword querying on fuzzy XML documents. To overcome present limitations, he proposes a semantics of object-oriented keyword querying on fuzzy XML documents and within this approach introduces a novel object-oriented keyword query algorithm, named ROStack. The advantage of this approach is in getting all resulting object nodes and their possibilities, including the query results matching all keywords, and query results matching partial keywords. Experiments performed to verify the effectiveness and efficiency of the proposed algorithm provided satisfactory results.

Vlado Glavinić
Editor-in-Chief