Foreword and Editorial

We are very happy to publish this issue of an International Journal of Software Engineering and Its Applications by Science & Engineering Research Support Society.

This issue contains 8 articles. Achieving such a high quality of papers would have been impossible without the huge work that was undertaken by the Editorial Board members and External Reviewers. We take this opportunity to thank them for their great support and cooperation.

This paper “Towards Multi-Bit Errors’ Detection by Analyzing Variable Dependency” illustrates a novel method to analyze variable dependencies of the instructions used in a program based on automated generation of dependence graph. Dependence graph depicts the connectivity among the program variables where variables work as the vertices and dependence between variables perform as edges. The automatic approach of generating dependence graph also discovers the critical variables of a program and these critical variables are used to detect multi-bit errors in an efficient way.

In the proposed paper entitled “Library Cloud: Concept and Design with Security Features”, the plan is to design a “Library Cloud” which would be the consortium of many digital libraries of different universities/academic institutions and also discuss the security features required to implement this cloud. This “Library Cloud” would help in saving so many resources of the libraries involved and sharing of knowledge amongst the members of the institutions concerned, which otherwise individually would not be feasible and possible.

This research “Linux Kernel Evolution: Analysis of Versions 3.0 and 3.2” analyzes the development progress of Linux Kernel versions 3.0.X and 3.2.X. It presents analysis of 101 3.0.X Linux kernel sub-versions from 5/8/2011 until 22/10/2013, and 69 3.2.X sub-versions, from 12/1/2012 till 10/5/2015. The outcomes of the analysis present minimum changes in the development of both Linux Kernel versions (in the checked parameters). It also performs a comparison of the studied parameters between 3.0.X and 3.2.X. In addition, it performs comparisons with older Linux kernel versions (i.e., 1.3.X, 2.1.X and 2.4.X) to understand the differences of the checked parameters.

In this context “Software Basis Path Test Optimization using Cultural Algorithm and Branch Distance Technique”, to search for more efficient test cases, optimization algorithms can be used. Usually the generation of test cases is complex in many software modules due to complexity of code structures. The method presented in this paper is based on cultural optimization algorithm and branch distance method. The process of test case generation is performed through optimization algorithm so that the desired paths are found.

This research paper “Performance Enhancement in Learning-to-Rank Approach for Software Defect Prediction” shows the enhanced Learning-to-Rank approach used for find out the defects from the test cases. In this paper Boltzmann learning can be used for enhancing the learning to rank approach. By using Boltzmann learning approach the rate of defect prediction will be increase. This research paper mainly focuses to increase the rate of defect prediction. This implementation can be performing by using test cases. This paper is implemented on 50 test cases. The algorithm of learning- to -rank approach is
also enhanced by using Boltzmann learning approach. It also shows the comparison results of learning-to-rank approach or enhanced learning to rank approach. Enhanced learning to rank approach is take less time to execute test cases and find out the defect prediction rate.

This paper “Non-functional Requirement Prioritization Approach”, proposes a non-functional requirement prioritization technique where both functional and non-functional requirements are prioritized and that is based on AHP (Analytic Hierarchy Process) technique employing suitable aspects. The non-functional requirements are further re-prioritized based on their dependency with high priority functional requirements and usage counts. The usage of the proposed method is illustrated with a hypothetical example. The technique is also executed on a case study of the evolving software and the technique resulted in selection of 16 requirements out of 30, yielding considerable reduction in the number of requirements to be implemented. Although the use of the AHP technique may limit the optimization, the use of the numerical assignment technique based on the usage count and dependency count do considerably reduce the number of requirements. The proposed technique prioritizes non-functional requirements independently from functional requirements but they are further selected in terms of their dependencies and usage counts with respect to functional requirements.

This paper “A Framework for Real-Time Sentiment Analysis of On-line Micro-texts with Sentiment Drift Detection Method”, offers a framework for the real-time sentiment analysis of on-line micro-texts with sentiment drift detection method. Furthermore, this paper also demonstrates the proposed framework with a case study; that utilized a dataset of tweets related to US election 2016, collected using Twitter API.

This paper “A Multi Criteria based Test Suite Optimization Framework” proposed the new optimization framework which works in three phases: test case analysis, test case clustering, and test suite optimization. Optimization further consists of the suitable combination of test suite reduction and prioritization. Rather than using only single coverage criteria, in this paper multi coverage criteria are incorporated for optimizing the test suite size. With the help of a simple program the performance of the proposed work has been assessed.

January 2017

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Editor of the January Issue on
International Journal of Software Engineering and Its Applications