
Preface

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Biographical notes: Chetna Gupta is an Assistant Professor (Senior Grade) at Jaypee Institute of Information Technology, India. She obtained her doctorate in the area of software testing. She also holds a Master's of Technology and a Bachelor of Engineering degree in Computer Science and Engineering. Her areas of interest are software engineering, requirement engineering, software testing, software project management, data structures, data mining and web applications. She has many publications in international journals and conferences to her credit. She is also guiding many PhD research scholars and Master of Technology students. She is also a reviewer for many reputed journals published by Springer, IGI Global and Inderscience Publishers. She is also Associate Editor of *International Journal of Computer Aided Engineering & Technology* (published by Inderscience Publishers, Scopus indexed) and guest editor for many special issues with Inderscience and IGI Global journals.

Varun Gupta is working as an Assistant Professor (Grade-III) at Amity University Noida and had earlier worked with NIT-Hamirpur, PEC University of Technology-Chandigarh, Jawaharlal Nehru Government Engineering College, Sundernagar, IIT-Mandi. He holds a PhD, MTech (research) and BTech (hons.) in Computer Science and Engineering. His area of interest is software engineering (requirement engineering, requirement prioritisation, global software development, software testing, etc.). He had authored a book with publisher based in Berlin, Germany and authored numerous research papers in peer reviewed, referred SCIE/Scopus indexed international journals and various international and national conferences that were held in India and Abroad. He is an Associate Editor of *IEEE Access* (IEEE), *IJCAET* (Inderscience Publishers), Deputy Editor-in-Chief of *IJSEC* (Serial Publishers), guest editor and review panel board member of many renowned international journals published by Inderscience, Springer, Wiley, IGI Global etc.

Maneesha Srivastav is an Assistant Professor at Jaypee Institute of Information Technology, India. She obtained her doctorate in the area of software engineering. She also holds a Master's of Technology and a Bachelor of Information Science degree in Computer Science and Engineering. Her areas of interest are software engineering, software testing and debugging, data structures and algorithms. She has many publications in international journals and conferences to her credit.

The special issue contains 11 papers from different countries, including Algeria, France, Japan and India. Achieving such high quality papers across the globe would not have been made possible without the continuous efforts made by editorial board members and the reviewers of the special issue. Reviewers put their tireless efforts for high quality rounds of double blind review and are acknowledged with heartfelt thanks. We are very thankful to Professor Quan Min Zhu, Editor-in-Chief of *IJCAT* for his continuous support and encouragement. The next few pages of this editorial briefly highlight the research work included in this special issue.

In the paper titled 'Software change prediction: a literature review', the authors conduct a review to evaluate all the available important studies from 1998 to 2011, relevant to the area of change proneness. The studies are investigated according to the publication year and have been dealt with numerous key perspectives focusing on the metrics, the dataset and the evaluation technique used by each study to carry out the results. The paper resulted in fruitful conclusions thereby leading to new research directions.

In the paper titled 'Historical prioritisation and reprioritisations using hierarchical historical R-tree', the authors propose a method for performing reprioritisations of current software increments and both prioritisation and reprioritisations of requirements belonging to the new similar project. Both requirements and decision aspects are handled by the proposal. The prioritisation and reprioritisation efforts are minimised by ensuring the reuse of historical preferences values by using the extended version of the historical R-tree called the hierarchical historical R-tree or just HHR tree. Thus the historical indexing structure as used in moving object database is modified and employed during incremental software delivery in the mass market.

In the paper titled 'Rewriting rule-based model for aspect-oriented software evolution', the authors propose a new evolutionary modelling technique where the aspect-oriented source code is modelled as an attributed coloured graph with the different dependencies in the software system being well defined. Then, the change requests are presented as rewriting rules on this coloured graph. The proposed approach, its implementation and empirical evaluation are given by the authors.

In the paper titled 'Method-level incremental code clone detection using hybrid approach', the authors present an incremental clone detection with hybrid approach, which detects clones in multiple revisions of a program. This hybrid approach is a combination of textual analysis and metrics computation, which has been enhanced with an added feature to the CloneManager tool.

In the paper titled 'Enhancing the fault prediction accuracy of CK metrics using high precision cohesion metric', the authors evaluate the Chidamber and Kemerer (CK) metric suite fault prediction capability. To further improve the accuracy of fault prediction, the authors explore

replacing the cohesion metric called lack of cohesion on methods in CK suite with the proposed cohesion metric called high precision cohesion metric. The data from 500 classes spread across 12 projects was selected for the study and the results shown that there is a considerable improvement in the prediction accuracy.

In the paper titled 'QM4MAS: a quality model for multi-agent systems', the authors propose a quality model for multi-agent systems called QM4MAS. The proposed model gives the link between the quality characteristics and the specificities of the multi-agent paradigm. The proposed model is validated by applying it to JADE applications through a set of metrics.

In the paper titled 'Investigating the relationship between project constraints and appropriate iteration length in agile development through simulations', the authors propose a model of agile development that focuses on iteration length, and propose a method of simulating a particular project to estimate the appropriate iteration length. Furthermore, the authors simulate the diverse situations using various parameters to understand the relationship between the iteration length and project constraints. The results show that the appropriate iteration length depends on the condition of the project constraints; the larger the amount of uncertainty, the shorter the appropriate iteration length, while the higher the complexity of the project, the longer is the iteration length.

In the paper titled 'Optimised class point approach for software effort estimation using adaptive neuro-fuzzy inference system model', the authors describe the process to calculate the cost of various software projects using class point approach. In this case, the fuzzy logic approach has been used to optimise the complexity value of various types of class, which in turn optimises the final estimated class point value. Furthermore, to improve the accuracy of the results obtained using class point approach, an adaptive neuro-fuzzy inference system (ANFIS)-based estimation model similar to class point analysis is used. Finally, a comparative analysis of the results obtained from the proposed model with the results obtained using other techniques such as regression analysis, artificial neural network and fuzzy logic system has been presented leading to the conclusion that effort estimation result obtained using ANFIS outperform the results obtained using other techniques.

In the paper titled 'Identification of crosscutting concerns at design level', the authors propose a new approach for the identification of crosscutting concerns at design level. This is materialised by class and sequence diagrams. Sequence diagram carries pertinent information which consists in interactions between objects of the software system, and the chronological order of its tasks.

In the paper titled 'Combined architectural framework for the selection of architectures using ATAM, FAHP and CBAM', the authors propose a fuzzy-based quantitative evaluation framework for accessing quality attributes to facilitate the selection of the underlying architectures. This software architecture evaluation framework addresses the

competing objectives of cost minimisation and quality maximisation between different architectural options.

In the paper titled 'Requirements driven test prioritisation approach for web service composition', the authors propose a model-based test sequence prioritisation technique using the coloured petri nets as a model for web service composition design verification. The effectiveness of the prioritisation technique is validated using the average percentage fault detection metric. The results show that the new proposed approach has high probability to outperform the random ordering on revealing regression faults in a modified web service composition code.

We take this opportunity to thank the authors for choosing our special issue for their quality work and for the patience on their part. We are quite hopeful that the research community will be blessed with the research work as contained in the special issue. Finally, we do hope for a great improvement in the area of software engineering thereby bringing prosperity in all work areas that are directly or indirectly driven by the software.

Wishing the authors of this special issue a very happy reading.