

Preface

The Internet, not only of computers, but also of things and human users, has been rapidly and profoundly changing the way of building, deploying and using software. To achieve the application goals, software systems on the Internet platform need to coordinate autonomously with third-party services and resources, adapt to constant changes in the interactive environment where they are situated and of the requirements they need to satisfy, and continuously maintain a certain level of service quality satisfying users.

This special topic focuses on software engineering for Internet computing, aiming to spread advanced and encouraging research work in this emerging field. After a rigorous review process leading by the domain experts, five papers are accepted as follows.

“Improving BDD-based attractor detection for synchronous Boolean networks” proposes a new approach to improve the efficiency of BDD-based attractor detection. This approach mainly consists of four parts: a monolithic algorithm for small networks, an enumerative strategy to deal with large networks, a method to accelerate attractor detection based on an analysis of the network structure, and two heuristics on ordering BDD variables. The authors demonstrate the performance of the approach on a number of examples and on a realistic model of apoptosis in hepatocytes.

“CBBR: enabling distributed shared memory-based coordination among mobile robots” proposes a framework named Coordination-enabled Behavior-Based Robotics (CBBR). This framework employs Distributed Shared Memory (DSM) to support coordination. It greatly simplifies the coordination logic while enables flexible and cost-effective coordination: the shared variables in the DSM act as the logical sensors capturing the status of coordination; the physical environment status and the coordination status can trigger the physical and the coordination behaviors; the scheduling of both types of behaviors integrates coordination into robot control. The authors conduct a case study to demonstrate the use of CBBR, and the performance measurements show the cost effectiveness of coordinating mobile robots based on CBBR, in terms of time, space, and energy consumption.

In the paper “Flourishing creativity in software development via Internetware paradigm”, the authors summarize the software creation process that a development environment needs to support, and defines six steps: searching, ideating, specifying, coding, testing and evolving. An E-Health application eco-system is used to illustrate the proposed development process model.

Paper “Determinants of pull-based development in the context of continuous integration” reports on a quantitative study that tries to resolve which factors affect the process of pull-based development model, including acceptance and latency. Using mixed effects logistic regression modeling on data extracted from 40 projects deploying the Travis-CI service in GitHub, they find that the evaluation process is an intricate issue affected by multi-level factors. In particular, CI is a dominant factor for the process, which not only has a great influence on the evaluation process *per se*, but also changes the effects of some traditional predictors.

Paper “Petri net based test case generation for evolved specification” is for addressing model-based testing more effectively. The authors propose a test case reusability analysis technique to identify reusable test cases of the original test suite based on graph analysis, such that new test cases can be generated to cover only the change-related parts of the new model. The Market Information System (MIS) is employed to demonstrate the feasibility and effectiveness of the proposed method. Their experimental results show that the use of our method saves about 31.5% test case generation cost.

We hope that the reader would benefit from the above research results, and join us to further explore the future of software engineering in the era of Internet computing.

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