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In this issue

Rachel Harrison [1]

In this issue, we have a special section and six regular research papers. The special section is on the automation of software testing. I am very grateful to the guest editors, Christof Budnik, Gordon Fraser, Francesca Lonetti, and Hong Zhu, for selecting and editing an excellent set of papers for this special section. The guest editors have also provided a short introduction to this special section.

The first four regular research papers are linked by the common themes of fault-proneness, safety-critical systems and data, whereas the final two papers are both mapping studies connected with testing.

In "An investigation of the fault-proneness of clone evolutionary patterns", Liliane Barbour, Le An, Foutse Khomh, Ying Zou and Shaohua Wang consider the sets of changes that maybe experienced by similar code fragments (clones) over time. The authors experimented with four software systems and identified clones using clone detection tools. They found that the size of a clone can impact the fault-proneness of a clone pair, and that adding information about clones can improve the explanatory power of fault prediction models.

The advent of self-driving vehicles has brought research into safety-critical systems to the forefront of many people's concerns. The paper "A tour of secure software engineering solutions for connected vehicles" by Antonia Bertolino, Antonello Calabro', Felicita Di Giandomenico, Giuseppe Lami, Francesca Lonetti, Eda Marchetti, Fabio Martinelli, Ilaria Matteucci and Paolo Mori discusses methods which address security issues in the automotive domain. The authors identify open research challenges and suggest potential directions for future research in this area.

Nowadays, we are living in a world with a surfeit of data, much of which is of dubious quality. The paper "Towards certified open data in digital service ecosystems" by Anne Immonen, Eila Ovaska and Tuomas Paaso considers how to guarantee the quality of open data. The authors provide an ecosystem for open data and digital service providers which can help support open data quality certification. Validation of the ecosystem is ongoing.

Continuing with the theme of data quality, the paper "Application of mutual information-based sequential feature selection to ISBSG mixed data" by Marta Fernández-Diego and

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Fernando González-Ladrón-de-Guevara discusses feature selection for software development effort estimation with respect to the ISBSG dataset. Four feature selection algorithms are compared using a dataset with 621 projects and 12 features. The authors found that two feature selection algorithms that discriminate between continuous and categorical features performed better than those that did not discriminate. They suggest that it could be interesting to deal with missing data by applying an imputation technique.

Mapping studies can give illuminating insights as to the advances and direction of a field. In "Model-based testing for software safety: a systematic mapping study", Havva Gulay Gurbuz and Bedir Tekinerdogan provide a systematic mapping study on the state-of-the-art in model-based testing for safety-critical systems. The authors found that that model-based testing can provide important benefits for software safety testing.

The final paper in this issue is also concerned with testing. In "A mapping study on testing non-testable systems", Krishna Patel and Robert M. Hierons present a mapping study on automated testing techniques. The authors provide discussions about each technique from various quality perspectives such as effectiveness, efficiency and usability. They also present a comparative analysis of these techniques in terms of these perspectives. Finally, potential research opportunities are also highlighted. The authors hope that their study will stimulate further advances in this field.

I hope that you will find this issue interesting and informative. As usual, if you have any suggestions or comments on this issue, please email me at rachel.harrison@brookes.ac.uk.

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