

SI Proposal: Machine Learning Techniques for Software Quality Evaluation

Guest Editors' Short CV

Mathieu Acher is Associate Professor at University of Rennes I / Inria (DiverSE team). His main research interests are related to the reverse engineering, modeling, automated reasoning, and learning of software variability spaces. He's leading the VaryVary ANR project about variability and machine learning. He's given tutorials at SPLC, MODELS, ECSA, and ASE. He's co-created and co-organized REVE and SPLTea workshops since 2014, as well as MASES held at ASE'18.

Apostolos Ampatzoglou is a Senior Researcher at the Department of Applied Informatics in the University of Macedonia, where he carries out research in the area of software engineering. His current research interests are focused on technical debt, reverse engineering, software maintainability, software quality management, open source software engineering and software design. He has published more than 70 articles in international journals and conferences. He serves as a reviewer in numerous leading journals of the software engineering domain, as part of the organizing committee of five prestigious conferences, and as a member of various international conference program committees.

Francesca Arcelli Fontana has her degree and Ph.D. in Computer Science taken at the University of Milano (Italy). She is currently in the position of Associate Professor at University of Milano Bicocca. The actual research activity principally concerns the software engineering field, in particular software evolution and reverse engineering, code smell and design pattern detection through machine learning techniques, architectural smell detection and managing technical debt. She is the head of the Software Evolution and Reverse Engineering Lab at University of Milano Bicocca and member of IEEE Computer Society.

Maxime Cordy is a Research Scientist at the University of Luxembourg. His main research interests are: quality assurance for variability-intensive and intelligent systems, AI-aided configuration, and the application of machine learning to software analysis. He authored 39 peer-reviewed publications on related topics. From 2015 to 2018, he was a co-founder of SKALUP, a spin-off company of the University of Namur, which is engineering AI software for the retail industry. Maxime Cordy animated a tutorial at ICSE'13 and another at SPLC'17. Recently, he co-created and co-organized the MASES workshop, collocated with ASE'18.

Xavier Devroey is a post-doctoral researcher at the Delft University of Technology, where he is involved in the EU Software Testing AMPlification (STAMP) and the 3TU Big Software on the Run (BSR) projects. His main research interests are in search-based and model-based software testing and variability-intensive systems. He co-animated a tutorial on testing variability-intensive systems at SPLC 2017. Co-organized the Advances in Model-based Testing (A-MOST) workshops, held at ICST'17 and ICST'18. And the 1st Int'l Workshop on Machine Learning and Software Engineering in Symbiosis (MASES), held at ASE'18.

Fabio Palomba is a Senior Research Associate at the University of Zurich, Switzerland. He received the European PhD degree in Management & Information Technology from the University of Salerno, Italy, in 2017. His PhD Thesis was the recipient of the 2017 IEEE Computer Society Best PhD Thesis Award (Italy section). His research interests include software maintenance and evolution, empirical software engineering, source code quality, and mining software repositories. He was the recipient of two ACM/SIGSOFT and one IEEE/TCSE Distinguished Paper Awards at ASE'13, ICSE'15, and ICSME'17, respectively, and Best Paper Awards at CSCW'18 and SANER'18. He serves and has served as a program committee member of various international conferences (e.g., MSR, ICPC, ICSME), and as referee for various international journals (e.g., TSE, EMSE, JSS) in the field of software engineering. Since 2016 he is Review Board Mem-

ber of EMSE and, since 2019, Editorial Board Member of JSS. He was the recipient of five Distinguished/Outstanding Reviewer Awards for his reviewing activities conducted for EMSE, IST, and JSS between 2015 and 2019.

Gilles Perrouin is an FNRS research associate at the University of Namur, Belgium. He is a member of the PReCISE research center and the Namur Digital Insitute (NaDI), in which he explores modeling and model-based testing for software product lines and intelligent systems. He co-organised several workshops at ICST, or SPLC on variability-intensive systems analysis and testing, co-organised MASES, held at ASE'18 and is program co-chair of the 13th VAMOS workshop, an European workshop dedicated to variability modelling of software-intensive systems.

Bartosz Walter works at Poznan University of Technology, Poland. He focuses on software maintenance and evolution, with particular interest in code smells and code quality indicators. He ha been serving as a reviewer for serveral conferences and journals. Additionally, he was a co-organizer for the previous editions of the MaLTTeSQuE workshop.

Workshop Information

The International Workshop on Machine Learning Techniques for Software Quality Evaluation (MaLTTeSQuE 2019 - <https://maltesque2019.github.io>) will be held in Tallinn, Estonia, on August 27th, 2019 and it will be collocated with the 27th Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC-FSE - <https://esec-fse19.ut.ee>). This edition of the workshop is the result of the fusion with the International Workshop on Machine Learning and Software Engineering in Symbiosis (MASES - <https://mases18.github.io>).

The primary goal of MaLTTeSQuE 2019 is to present the most recent advances and breakthroughs at the intersection of machine learning applications and the assessment of software quality aspects, and to promote an intensive and continuous exchange of ideas among researchers and practitioners. MaLTTeSQuE 2019 solicits three categories of contributions: research paper (up to 6 pages), industry innovation paper (up to 6 pages), and extended abstract (up to 2 pages). While research papers describe original work, industry innovation papers and extended abstracts tend to attract more practitioner contributions by sharing their experiences, work-in-progress, and novel ideas. Based on the past two editions of MaLTTeSQuE as well as the first edition of MASES, we expect to receive 15 submissions or more in total. Each submission will be reviewed by at least three members of the program committee.

Scope of the Special Issue

The assessment of software quality is one of the most multifaceted (e.g., structural quality, product quality, process quality, etc.) and subjective aspects of software engineering (since in many cases it is substantially based on expert judgement). Such assessments can be performed at almost all phases of software development (from project inception to maintenance) and at different levels of granularity (from source code to architecture). However, human judgment is: (a) inherently biased by implicit, subjective criteria applied in the evaluation process, and (b) its economical effectiveness is limited compared to automated or semi-automated approaches. To this end, researchers are still looking for new, more effective methods of assessing various qualitative characteristics of software systems and the related processes. In recent years, we have been observing a rising interest in adopting various approaches to exploiting machine learning (ML) and automated decision-making processes in several areas of software engineering. These models and algorithms help to reduce effort and risk related to human judgment in favor of automated systems, which are able to make informed decisions based on available data and evaluated with objective criteria. Thus, the adoption of machine learning techniques seems to be one of the most promising wats to

improve software quality evaluation. Conversely, learning capabilities are increasingly often embedded within software, including in critical domains such as automotive and health. This calls for the application of quality assurance techniques to ensure the reliable engineering of ML-based software systems. All these aspects represent an opportunity for researchers to improve current solutions and/or devise novel methodologies to effectively employ machine learning approaches in practice. As such, the special issue will invite submissions on new and innovative research results and industrial experience papers in the area of machine learning applications for software quality evaluation. Submissions could deal with all aspects of the problem, including, but not limited to, the following topics of interest:

- Application of machine-learning in software quality evaluation,
- Analysis of multi-source data,
- Knowledge acquisition from software repositories,
- Adoption and validation of machine learning models and algorithms in software quality,
- Decision support and analysis in software quality,
- Prediction models to support software quality evaluation,
- Validation and verification of learning systems,
- Automated machine learning,
- Design of safety-critical learning software,
- Integration of learning systems in software ecosystems.

Guidelines and Schedule of the Special Issue

Submission and Review Guidelines:

All submitted papers will undergo a rigorous peer-review process and should adhere to the general principles of the Journal of Systems and Software articles. Submissions have to be prepared according to the Guide for Authors in <http://ees.elsevier.com/jss>. Submitted papers must be original, must not have been previously published or be under consideration for publication elsewhere. In case a paper has been already presented at a conference, it should be extended by at least 30% new material, before submitted for this special issue. Authors must provide any previously published material relevant to their submission and describe the additions made. Please note that a number of papers from MaLTeSQuE 2019 might be invited for this special issue.

Important Dates:

15 November 2019: Full paper submission deadline
21 February 2020: Authors notification
22 May 2020: Authors revisions
26 June 2020: Final notification
10 July 2020: Final manuscript