Preface to the JOT issue on 18th European Conference on Modelling Foundations and Applications (ECMFA 2022)

Sahar Kokaly[*] **and Davide Di Ruscio**[**]
[*]General Motors/McMaster University (Canada)
[**]University of L'Aquila (Italy)

ABSTRACT In this preface, the editors present an overview of the topics and scope of the European Conference on Modelling Foundations and Applications (ECMFA) and describe the editorial and reviewing process for its 18th edition (ECMFA 2022). The papers selected for publication and presentation are overviewed, and the details about the keynote talk by Toine Hurkmans, Chief Architect at Mendix, are given. Finally, the ECMFA committees are acknowledged.

KEYWORDS Model-based engineering, modelling foundations, modelling applications

1. Introduction: About ECMFA

The European Conference on Modelling Foundations and Applications (ECMFA) is the premier European forum dedicated to advancing the state of knowledge and fostering the application of all aspects of Model-based Engineering (MBE) and related approaches.

Model-based Engineering addresses the design, analysis, and development of software and systems relying on exploiting high-level models and computer-based automation to achieve significant boosts in both productivity and quality.

In its 16th edition, ECMFA introduced two major successful innovations that have been maintained in the current 18th ECMFA edition to strengthen the community's scope and foster the quality of its contributions.

– First, the International Conference on Model Transformations (ICMT) joined forces with ECMFA, merging both into one single event that unites all aspects related to Model-Based Engineering (MBE).
– Second, a two-phase submission and review process was introduced, with two possible submission periods (October and February). Authors of papers not accepted in the first phase were invited to re-submit improved versions of their work in the second submission phase that also welcomed fresh submissions.

Due to the COVID-19 pandemic and its associated restrictions, the steering and organizing committee decided to celebrate the conference in a hybrid manner (in person in Nantes, France as well as online) in July 2022.

2. Submission and review process

2.1. Types of submissions

ECMFA solicits two types of papers presenting original research on all aspects of model-based engineering:

– **Foundation Papers**, dealing with modeling foundations, such as metamodeling, model transformations, model validation, verification and testing, model engineering methods and tools, and related aspects.
– **Application Papers**, dealing with the application of modeling techniques, including experience reports on the use of MBE methods and tools, industrial case studies, or successful applications of MBE practices in industry or in public administration, with significant modeling lessons

JOT reference format:
Sahar Kokaly and Davide Di Ruscio. *Preface to the JOT issue on 18th European Conference on Modelling Foundations and Applications:(ECMFA 2022).* Journal of Object Technology. Vol. 20, No. 3, 2022.
http://dx.doi.org/10.5381/jot.2022.20.3.e1

learned. All applications must have been done in real contexts and at least one of the authors of the paper must be from the company or administration where the application took place.

No simultaneous submission to other publication outlets (either a conference or a journal) was allowed.

2.2. Topics of interest

Topics of interest included, but were not limited to:

- Foundations of MBE;
- Application of MBE methods, tools, and techniques to specific domains, e.g., automotive, cyber-physical systems, robotics, Artificial Intelligence or IoT;
- Successful use of MBE in connection with other disciplines and approaches, such as Artificial Intelligence, Blockchain, or Open Source;
- Educational aspects of MBE;
- Tools and initiatives for the successful adoption of MBE in industry.

2.3. Review criteria and process

All submissions have been peer-reviewed by at least three members of the Program Committee, who assessed them in terms of their novelty, significance, technical quality, rigor, and suitability for the conference.

Contributions could be submitted to any of the two submission deadlines: October 10, 2021, or February 20, 2022.

Papers submitted to the first round of review could be accepted-as-is, accepted with minor revisions, undergo major revisions (and be re-submitted in the second round), or rejected. Recommendations for papers submitted in the second round are for accept, minor revisions, or reject.

Papers accepted at any of the two rounds with minor revisions were given around one month to complete the revisions. The same reviewers assessed how well the authors have addressed the revision requests and whether the final paper maintained or improved the level of contribution of the original submission. Papers not accepted in the first round could be resubmitted in the second, indicating how the authors improved the article to address the reviewers' criticisms.

Additionally, this year, we have encouraged the authors of papers submitted and rejected (with minor revisions) in the second round to address the concerns presented and submit the revised manuscript as a regular submission to The Journal of Object Technology (JOT). The idea is to try to have their paper assigned to the same ECMFA2022 reviewers so that the evaluation of the journal submission will build on the previous reviews.

3. Accepted papers

In the first round, ECMFA received 11 submissions. Three were given a minor revision, five a major revision, and three were rejected. All 3 minor revisions were successfully addressed by the authors and the program committee agreed to accept the papers. With respect to the 5 major revisions, only 3 of them were re-submitted to the second round and reviewed again. In the second round, ECMFA received 21 submissions. These new papers, plus the 3 re-submitted ones constituted a total of 24 papers submitted to the second round. One of the re-submitted papers was accepted and two rejected.

In summary, from received 32 papers, 11 were accepted (2 Application submissions and 9 Foundation submissions) resulting in an acceptance rate of 33%.

The list of accepted papers is as follows:

- Oliver Kautz, Bernhard Rumpe and Louis Wachtmeister. Semantic Differencing of Use Case Diagrams.
- Sebastien Mosser, Corinne Pulgar and Vladimir Reinharz. Modelling Agile Backlogs as Composable Artefacts to support Developers and Product Owners.
- Hao Wu. A Query-based Approach for Verifying UML Class Diagrams with OCL Invariants.
- Thibaut Capuano, Houari Sahraoui, Benoît Frénay and Benoît Vanderose. Learning from Code Repositories to Recommend Model Classes.
- Nils Weidmann, Enes Yigitbas, Anthony Anjorin, Ankita Srivastava and Jane Jose. Human-in-the-Loop Large-Scale Model Transformations with the VICToRy Debugger.
- Robbert Jongeling, Johan Fredriksson, Jan Carlson, Federico Ciccozzi and Antonio Cicchetti. Structural consistency between a system model and its implementation: a design science study in industry.
- Nathalie Moreno, Alejandro Perez-Vereda and Antonio Vallecillo. Managing Reputation in Collaborative Social Computing Applications.
- Max Härtwig and Sebastian Götz. Mobile Modeling with Real-Time Collaboration Support.
- Jérôme Pfeiffer, Daniel Lehner, Andreas Wortmann and Manuel Wimmer. Modeling Capabilities of Digital Twin Platforms - Old Wine in New Bottles?
- Alfa Yohannis, Alfonso de la Vega and Dimitris Kolovos. Vaultage: Automatic Generation of Secure Communication around Decentralised User-Managed Data Vaults.
- Nico Jansen, Jérôme Pfeiffer, Bernhard Rumpe, David Schmalzing and Andreas Wortmann. The Language of SysML v2 under the Magnifying Glass.

4. Keynote by Toine Hurkmans, Chief Architect at Mendix

Toine Hurkmans, Chief Architect at Mendix delivered on Wednesday, July 6, 2022, the keynote talk entitled "Democratization of software development using Low code".

4.1. Abstract

Within Enterprises, software development and operations is controlled within the IT domain. The gap between Business and IT enfolds two ways. First the speed in which IT can keep up with faster changing business and second the (lack of) understanding between business and IT. Low code application platforms can bridge this gap. First by increasing the speed in which applications can be developed. Second by enabling the

business to (co)develop and manage applications themselves, without having engineering knowledge and skills. Software development will become part of the business domain, democratizing software development no longer solely being owned by IT. This creates opportunities as well as risks for both Business and IT. It is still unknown what the impact is, however it is clear Enterprises will need and therefore use Low code application platforms to meet the growing demand for applications as well as the ability to quickly adapt IT systems to support business requirements. One of the challenges to be addressed is the interoperability of Low code applications within a software system. Another challenge regards governance, especially on how to control security on data made available through Low code applications as being developed and managed by the Business.

4.2. Biography

Toine Hurkmans is Chief Architect of Mendix, a Siemens Company and Global Leader in Low Code Application Platforms. He has over 30 years of experience within software engineering and software architecture of Financial, ERP, CRM, HRM & Payroll software systems. The last 10 years he mainly worked on the transition of on-premise software systems to SaaS and Cloud-based environments. Nowadays his main focus lies on the architecture of hybrid software systems in which Low code applications can be developed, deployed and operated.

5. Committees

Following the ECMFA tradition, ECMFA 2022 had two Program co-chairs. They were:

- Sahar Kokaly, General Motors/McMaster University (Canada)
- Davide Di Ruscio, University of L'Aquila (Italy)

Despite the European nature of the conference, the Program Committee of ECMFA 2022 was composed of 38 international MBE experts from both academia and industry:

- Adrian Rutle, Western Norway University of Applied Sciences, Norway
- Alessandra Bagnato, Softeam, France
- Alfonso Pierantonio, University of L'Aquila, Italy
- Andy Schürr, TU Darmstadt, Germany
- Antonio Cicchetti, Mälardalen University, Sweden
- Antonio Vallecillo, University of Malaga, Spain
- Arend Rensink, University of Twente, The Netherlands
- Athanasios Zolotas, University of York, UK
- Benoit Combemale, University of Rennes 1, France
- Bernhard Rumpe, RWTH Aachen University, Germany
- Bran Selic, Malina Software Corp., Canada
- Carlos Gustavo Lopez Pombo, Universidad de Buenos Aires, Argentina
- Daniel Varro, McGill University (Canada)/ Budapest University of Technology and Economics (Hungary)
- Dimitris Kolovos, University of York, UK
- Esther Guerra, Universidad Autónoma de Madrid, Spain
- Federico Ciccozzi, Mälardalen University, Sweden
- Gabriele Taentzer, Philipps-Universität Marburg, Germany
- Gregor Engels, University of Paderborn, Germany
- Haiyan Zhao, Peking University, China
- Javier Troya, University of Malaga, Spain
- Jeff Gray, University of Alabama, USA
- Jesús Sánchez Cuadrado, Universidad de Murcia, Spain
- Joel Greenyer, Leibniz Universität Hannover, Germany
- Jörg Kienzle, McGill University, Canada
- Juha-Pekka Tolvanen, MetaCase, Finland
- Loli Burgueño, Open University of Catalonia,Spain
- Ludovico Iovino, Gran Sasso Science Institute, Italy
- Manuel Wimmer, Johannes Kepler University Linz, Austria
- Mark van den Brand, Eindhoven University of Technology, The Netherlands
- Matthias Tichy, Ulm University, Germany
- Mehrnoosh Askarpour, General Motors, Canada
- Richard Paige, McMaster University, Canada
- Sebastien Gerard, CEA LIST, France
- Shaukat Ali, Simula Research Laboratory, Norway
- Steffen Zschaler, King's College London, UK
- Thomas Kuehne, Victoria University of Wellington, New Zeland
- Vadim Zaytsev, Universiteit Twente, The Netherlands
- Zinovy Diskin, McMaster University, Canada

Six additional sub-reviewers helped with the papers during the reviewing process:

- Nils Weidmann
- Kousar Aslam
- Hendrik Göttmann
- Jonas Ritz
- Mahdi Saeedi Nikoo
- Flo Drux

6. Acknowledgments

We would like to thank the organizing committee, especially to the General Chair Richard Paige (McMaster University, Canada), for providing us with all the necessary resources and support to organize ECMFA 2022. Thanks to the JOT EiC Alfonso Pierantonio (University of L'Aquila) for all his help with the publication process. Thanks to all those who trusted ECMFA and submitted papers, regardless of whether they were accepted or not, and particularly to the presenters of the accepted papers. We also warmly thank the many participants who contributed to the open discussions with their comments and experience. Many thanks to the reviewers and the members of the Program Committee, for their timely and accurate reviews and for their helpful suggestions for improving the selected papers. We also thank our keynote speaker Toine Hurkmans for accepting our invitation to give such an interesting talk. Last but not least, thanks to the Steering Committee, in particular to Antonio Vallecillo and Richard Paige, for their help and support in our decision making.

References

About the authors

Sahar Kokaly is a Software Safety Engineering Manager for Automated Driving and Active Safety at General Motors, Canada and Adjunct Professor in the Department of Computing and Software at McMaster University, Canada. She is interested in Model-Based Software Engineering, Software Safety and Automotive Software Development. You can contact her at sahar.kokaly@gm.com.

Davide Di Ruscio is an Associate Professor at the University of L'Aquila (Italy). His main research interests are related to several aspects of Software Engineering, Open Source Software, Model-Driven Engineering, and Recommender Systems. You can contact him at davide.diruscio@univaq.it or visit http://people.disim.univaq.it/diruscio/.