

tively test the core AI module once it has even a moderate number of inputs.

While the "unknown unknowns" will always exist, their effects can be reduced with good processes. Some interesting questions evolved from the concept of the contract between the AI specialist and the problem owner. What are component's properties that the AI specialist delivers? How should they be described? What does it mean legally? How would one test for legal conformity against what is actually statistical properties in high dimensions? These are questions that need to be answered.

Quality of data and methods

The quality of data is an obvious weakness of AI. It is especially true if the system continuously learns from new data, as there is generally poor control over bias in this stream, and according to experience, the quality of data tends to deteriorate over time. Many of the participants advocated requiring AI providers and users to openly publish all their data. This was criticised based on issues of individual privacy and, business considerations. The proposed solution is to create AI auditors that will perform audits in a similar way to financial audits but on processes and data practices related to AI. It may be possible to create standards for training data with corresponding certification ("Only organic data used"). Given the rapid development in the area, it was suggested that this should be done by industry consortia or institutes, as formal standardisation processes would be too slow. If data is shared in several steps, a pedigree of the data needs to be established. A complementary approach that was suggested, is to provide good public datasets on which systems can be trained. A question is then how to maintain quality and relevance over time. This would require a curator, which could be – as mentioned above – under the auspices of the European Commission and might be part of the mission of data factories. There also need to be best practices on how to use data for training, testing and validation, the importance of cross-validation and permutation, etc.

Please note that the ideas presented do not necessarily reflect the opinions of any individual participant in the workshop.

Participants

The participants of the workshop were:

- Björn Levin, RISE
- Gabriel David, INESC TEC
- Daniel Gillblad, RISE
- Arnaud Gotlieb, Simula Research Laboratory
- Olivier Grisel, Inria
- Alípio Jorge, INESC TEC
- Bert Kappen, Radboud University
- Fabio Martinelli, CNR
- Michael Mock, Fraunhofer IAIS
- Anirban Mukhopadhyay, TU Darmstadt
- Ana Paiva, INESC-ID
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25th International Conference on Formal Methods for Industrial Critical Systems

by Maurice ter Beek

The yearly conference of the ERCIM Working Group on Formal Methods for Industrial Critical Systems, FMICS, reached its 25th edition this year. A panel "Genesis, Success Stories, and the Next 25 Years" was organized to celebrate this remarkable milestone. The conference took place virtually on 2-3 September, hosted by TU Wien.

The aim of the FMICS conference series is to provide a forum for researchers interested in the development and application of formal methods in industry. The conference was chaired by Maurice ter Beek (ISTI-CNR, Italy) and Dejan Ničković (AIT, Austria) and organized under the umbrella of QONFEST 2020 organized by Ezio Bartocci (TU Wien, Austria). FMICS attracted a record number of 149 participants from many countries worldwide. QONFEST attracted over 400 participants. A good number of 26 papers were submitted, of which eleven were accepted. The program included three keynote lectures, partially shared with the QONFEST conferences CONCUR, FORMATS and QEST, by Roderick Bloem (TU Graz, Austria), Thomas Henzinger (IST, Austria), and Stefan Resch (Thales, Austria).

Following a tradition, Springer provided an award for the best FMICS paper. This year, the reviewers selected the contribution "Verifiable and Scalable Mission-Plan Synthesis for Multiple Autonomous Agents" by Rong Gu, Eduard Enoiu, Cristina Seceleanu, and Kristina Lundqvist for the FMICS 2020 Best Paper Award. The panel celebrating the 25th anniversary of FMICS was a big success. The founders and previous chairpersons of the ERCIM WG FMICS acted as panelists. Diego Latella (ISTI-CNR) recalled the original motivation and beginning of FMICS, Stefania Gnesi (ISTI-CNR) shared some success stories, and Hubert Garavel (Inria) presented a study on the future of formal methods and their adoption in industry. The detailed report [1] of this study, included in the proceedings [2], presents an analysis of the opinions of 130 renowned experts in formal methods, as well as thought-provoking position statements on formal methods of 111 of them.

Link: <https://fmics20.ait.ac.at/>

References:

- [1] H. Garavel, M.H. ter Beek, and J. van de Pol: "The 2020 Expert Survey on Formal Methods", in [2], pp. 3-69.
DOI: http://dx.doi.org/10.1007/978-3-030-58298-2_1
- [2] M.H. ter Beek and Dejan Ničković (eds.): "Formal Methods for Industrial Critical Systems: Proc. of FMICS'20", Springer LNCS, 2020.
DOI: <http://dx.doi.org/10.1007/978-3-030-58298-2>

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