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Guest Editorial
Papers selected from 8th International Conference on Model and Data Engineering (MEDI 2018)

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This special issue aims at shedding the light on some recent and significant advances in the field of model and data engineering. It presents selected papers from the scientific workshops that were held in conjunction with the 8th International Conference on Model and Data Engineering (MEDI 2018), which took place in Marrakesh, Morocco, October 24-26, 2018. MEDI 2018 attracted four workshops on a wide range of topics that fall into the main area of the MEDI 2018 conference:

1. The Model and Data Engineering for Social Good Workshop (MEDI4SG)
2. The international workshop on moDeling, vErification and Testing of dEpendable CriTical systems (DETECT)
3. The International Workshop: Formal Model for Multifaceted Systems (REMEDY)
4. The Second International Workshop on Cybersecurity and Functional Safety in Cyber-Physical Systems (IWCFS)

This special issue was managed as follows: the organizers of the first three workshops proposed their best paper, except DETECT that suggested two papers. This is because this workshop had a good acceptance rate since it attracted 19 submissions and only six papers have been accepted. We also invited one paper from the MEDI 2018 main conference based on its good ranking. The content of each paper has been extended by at least 30%. After the second round of reviews, we finally accepted five papers.
We congratulate the authors who submitted articles to MEDI 2018 workshops.

The five selected papers are summarized as follows:

The first article titled, "A Mobile Crowd Sensing Framework for Suspect Investigation: An Objectivity Analysis and De-Identification Approach", by Hasna Elalaoui Elabdallaoui, Abdelaziz Elfazziki, Fatima Zohra Ennaji, Mohamed Sadgal introduces an approach to develop a crowdsourcing framework allowing a wider collaboration between citizens and their authorities. It mainly allows collecting information on crimes and suspects, computing users credibility and information reliability. A de-identification mechanism is also used to anonymize data users. The proposed framework is generic, can be used in different contexts and is suitable for any type of crimes that can be witnessed

by citizen participants. Unsupervised machine learning techniques are used to cluster reported locations on crimes before applying an objectivity analysis. This latter is based on a probabilistic algorithm to identify the most reliable crime locations.

The second article titled, "Verification and Testing of Safety-Critical Airborne Systems: a Model-based Methodology", by Mounia Elqortobi, Warda El-Khouly, Amine Rahj, Jamal Bentahar, Rachida Dssouli highlights the importance of formal verification and testing activities in the avionics software development cycle. It then addresses the safety-critical software verification and testing issue and proposes to integrate model-based verification and model-based testing within a single framework. The defined framework starts first by formally modeling the safety-critical airborne system from informal and consistent requirement specifications, and produces an FSM-like model. The obtained model is then refined and encoded in the extended Interpreted Systems Programming Language (ISPL+). Computation Tree Logic (CTL) is also used to extract and express the system requirements in the form of temporal properties. Intended properties are automatically checked and witness-examples or counter-examples are generated to either prove the satisfaction of properties or guide designers to detect and repair errors in the formal system model.

The third article titled, "Business Process Specification, Verification, and Deployment in a Mono-Cloud, Multi-Edge Context", by Saoussen Cheikhrouhou, Slim Kallel, Ikbel Guidara, Zakaria Maamar focuses on the satisfaction of time-constrained business processes in the context of cloud and edge-based resources. It presents an approach to formally specify and verify cloud resources allocation to business processes using Time Petri- Nets model, and to fragmenting and deploying free-of-violations time-constrained business processes on mono-cloud and multi-edge context. Different phases are introduced at both design and run time, including specification, (ongoing) placement, transformation, and (ongoing) verification. The ongoing verification phase produces a list of violations that are handled in the ongoing placement by producing corrective actions, mainly on where future data and tasks should be re-placed to better satisfy time constraints.

The fourth article titled, "A Tool-assisted Method for the Systematic Construction of Critical Embedded Systems using Event-B", by Pascal André, Christian Attiogbé, Arnaud Lanoix concerns the critical embedded systems and proposes an Event-B based approach to support formal modeling of the full software design process to better address reliability and correctness construction requirements. The design of a companion tool of the proposed method is presented and experimented in the context of the landing gear case study which is a typical cyber-physical system involving the control and interaction of software and physical components.

The fifth article titled "Game-based learning and Gamification to improve skills in early years' education", by Rachid Lamrani and El Hassan Abdelwahed focuses on how to improve children's skills in their early years education and reduce the drop-out rate of learners through play-based learning and gamification mechanisms. The proposed system principles are aligned with the main orientations of the Montessori approach. Different factors for the assessment of the proposed solution are identified and a variety of serious gaming activities is provided.

We gratefully acknowledge the support of the contributors to this special issue and express our great esteem to the anonymous reviewers for the time and effort they have put in reviewing these papers. For readers of this volume, we hope you will find its content

interesting and will inspire you to look further into the challenges that still lie ahead in our digital society. We also would like to thank Prof. Mirjana Ivanovic, the editor in chief of the COMSIS journal for accepting to run this special issue.