

Preface

In this volume of “Advances in Intelligent Systems and Computing,” we are pleased to present proceedings of the Eleventh International Conference on Dependability and Complex Systems *DepCoS-RELCOMEX* which took place in a picturesque Brunów Palace in Poland from June 27 to July 1, 2016. It was an event in a series organized annually by Department of Computer Engineering of Wrocław University of Science and Technology since 2006 although its heritage is much older. It dates nearly 40 years back and begun with two cycles of events: RELCOMEX (1977–89) and Microcomputer Schools (1985–95) which were then organized by the Institute of Engineering Cybernetics (predecessor of the Department) under the leadership of Prof. Wojciech Zamojski, still the DepCoS chairman. In contrast to those previous events focused on classical reliability analysis, the DepCoS mission is to promote a more comprehensive approach which in the new century has earned the name *dependability*. Products of the conferences were initially published by the IEEE Computer Society (2006–09), then also by Wrocław University of Technology Publishing House (2010–12) and presently by Springer in “Advances in Intelligent Systems and Computing” Volume nos. 97 (2011), 170 (2012), 224 (2013), 286 (2014), and 365 (2015).

Design, implementation, and maintenance of contemporary complex systems have brought many new challenges to “classic” reliability theory. The complex systems are understood by us as integrated unities of technical, information, organization, software, and human (users, administrators, and management) assets, and their complexity comes not only from involved technical and organizational internal structure built upon diverse hardware and software resources but also from complexity of information processes (data processing, monitoring, management, etc.) which must be executed in their specific environment. In operation of such wide-ranging (and often also geographically distributed) systems, their resources are dynamically allocated to ongoing tasks and the rhythm of system events (incoming and/or ongoing tasks, decisions of a management subsystem, system faults, defensive system reactions and adaptations, etc.) may be considered as deterministic and/or probabilistic stream of events. Security and confidentiality issues

enforced by social context of information processing introduce further complications into the modelling and evaluation methods. Diversity of the processes being realized, their concurrency and their reliance on in-system intelligence often make construction of strict mathematical models impossible and lead to application of intelligent and soft computing methods.

Dependability is the contemporary answer to new challenges in reliability evaluation of such systems. Dependability approach in theory and engineering of complex systems (not only computer systems and networks) is based on multi-disciplinary approach to system theory, technology, and maintenance of the systems working in real (and very often unfriendly) environment. Dependability concentrates on efficient realization of tasks, services, and jobs by a system considered as a unity of all technical, information, and human assets, in contrast to “classical” reliability which is more restrained to analysis of technical resources (components and structures built from them). This difference has shaped natural evolution in topical range of subsequent DepCoS conferences which can be seen over the recent years.

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Thanking all the authors who have chosen DepCoS as the publication platform for their research, we would like to express our hope that their papers will help in further developments in design and analysis of complex systems, being a valuable source material for scientists, researchers, practitioners, and students who work in these areas.

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