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PREFACE

Software-intensive control systems are becoming progressively more complex. Numerous industrial sectors such as telecommunication, automotive, aerospace, or nuclear power generation are examples of areas where software-intensive systems are becoming prevalent, extremely complex, and decisive for human safety and for reliability. As there is an accelerated growth of demands for functionality and dependability of such systems, our intellectual and engineering abilities are being challenged to come up with practical solutions to the problems faced in the design and development of complex real-time and safety-related control systems.

Even though software testing is an essential part of manufacturing embedded systems, and significant research efforts have been devoted to it, the current state of the practice in system and software verification and validation (V&V) leaves much to be desired. In many industries, V&V is not receiving the attention deserved, and other important activities such as testing functional and non-functional requirements, modeling large software systems, conformance, acceptance and qualification testing, or measuring the effectiveness of different V&V approaches have not yet been incorporated into the V&V processes employed. Therefore, it was decided to address these issues in a joint event, merging in 2004 the 28th IFAC/IFIP Workshop on Real-Time Programming (WRTP) with the International Workshop on Software Systems (IWSS).

The goal of this workshop was to communicate state-of-the-art methods to assess quality and reliability of software-based systems with the help of validation, verification and test across various domains, and to advance the state-of-practice in validating software and software-based systems. It brought together leading experts on such diverse aspects in the development of complex control systems with safety relevance as systems engineering, software engineering, risk and reliability engineering, real-time computing, control engineering and ergonomics. They addressed key issues, shared experiences, discussed emerging and common technical approaches, and presented their respective methods to construct complex systems composed of hardware, software, and humans. In addition to the presentation of high quality technical papers, the programme also featured four world class keynote addresses, and several intensive panel discussions. Accordingly, these Proceedings comprise the keynote speeches, the 24 papers presented, and three summaries of the discussions. These contributions come from Brazil, Canada, France, Germany, Greece, India, Italy, Latvia, Poland, Slovenia, Spain, Sweden, Turkey, and the U.S.A.

As it holds for all successful events, this joint workshop required the effort of many individuals and organisations. The authors, presenters, and all speakers are to be commended for a truly excellent job. The International Programme Committee and other reviewers selected the best candidates out of many quality submissions. We are indebted to IFAC and its Technical Committee on Computers for Control. Formal co-sponsorship was provided by IFIP, the United States Nuclear Regulatory Commission, the OECD Nuclear Energy Agency with its Committee on Safety of Nuclear Installations, the (U.S.) National Aeronautics and Space Administration, the American Nuclear Society, the University of Maryland Center for Technology Risk Studies, and the Turkish National Science Foundation. The Turkish National Organisation Committee of Automatic Control as National Member Organisation of IFAC and the Center for Technology Risk Studies of the University of Maryland supported the workshop generously. Members of this Center, of whom Mrs. Nihal Kececi is to be especially mentioned, volunteered significant time to organise and run the workshop. The financial support provided by the United States Nuclear Regulatory Commission is highly appreciated.

All attendees enjoyed the Turkish hospitality. The meeting took place in an Istanbul hotel overlooking the magnificent scenery of the Bosphorus where Europe and Asia meet. This enabled a fruitful technical exchange between the participants in a very friendly and relaxed atmosphere.

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