

En 50128 Railway Applications Testing And Analysis

This book presents the refereed proceedings of the 14th International Symposium on Formal Methods, FM 2006, held in Hamilton, Canada, August 2006. The book presents 36 revised full papers together with 2 invited contributions and extended abstracts of 7 invited industrial presentations, organized in topical sections on interactive verification, formal modelling of systems, real time, industrial experience, specification and refinement, programming languages, algebra, formal modelling of systems, and more.

Advances in Systems Safety contains the papers presented at the nineteenth annual Safety-Critical Systems Symposium, held at Southampton, UK, in February 2011. The Symposium is for engineers, managers and academics in the field of system safety, across all industry sectors, so the papers making up this volume offer a wide-ranging coverage of current safety topics, and a blend of academic research and industrial experience. They include both recent developments in the field and discussion of open issues that will shape future progress. The 17 papers in this volume are presented under the headings of the Symposium's sessions: Safety Cases; Projects, Services and Systems of Systems; Systems Safety in Healthcare; Testing Safety-Critical Systems; Technological Matters and Safety Standards. The book will be of interest to both academics and practitioners working in the safety-critical systems arena.

Software is continuously increasing in complexity. Paradigmatic shifts and new development frameworks make it easier to implement software – but not to test it. Software testing remains to be a topic with many open questions with regard to both technical low-level aspects and to the organizational embedding of testing. However, a desired level of software quality cannot be achieved by either choosing a technical procedure or by optimizing testing processes. In fact, it requires a holistic approach. This Brief summarizes the current knowledge of software testing and introduces three current research approaches. The base of knowledge is presented comprehensively in scope but concise in length; thereby the volume can be used as a reference. Research is highlighted from different points of view. Firstly, progress on developing a tool for automated test case generation (TCG) based on a program's structure is introduced. Secondly, results from a project with industry partners on testing best practices are highlighted. Thirdly, embedding testing into e-assessment of programming exercises is described.

Aimed at experts who are dedicated to software testing, *The Software Testing Process: Test Management* addresses the major issues related to advanced, state-of-the-art test management. This book covers the syllabus required to pass the Certified Tester Examination - Advanced Level as defined by the International Software Testing Qualifications Board (ISTQB). Software developers, project managers, quality managers, and team leaders will benefit from the comprehensive coverage of risk oriented management and the way testing is shown to be an integral, though independent part of software development. Included are best practices in the field of testing, as well as detailed descriptions of involved tasks, roles, and responsibilities. Well suited for self-study, the reader is "taken by the hand" and guided through the key concepts and terminology of software testing in a variety of scenarios and case studies (as featured in the first book in this series, *Software Testing Foundations*). Not only will testers and test managers find this a must-read, but anyone requiring advanced professional knowledge and skills in this field, anyone wanting to become a true testing professional, will find this book a must for a successful, well-founded education in advanced test management. Topics include: Test process and test tools Testing in the software life cycle Test policy and test manual Test plan and test planning Test control Incident management Risk management/risk-based testing Staff qualifications Test metrics

This book constitutes the refereed proceedings of the 5th International Colloquium on Theoretical Aspects of Computing, ICTAC 2008 held in Istanbul, Turkey in September 2008. The 27 revised full papers were carefully reviewed and selected from over 70 submissions. The aim of the colloquium is to bring together practitioners and researchers from academia, industry and government to present research results, and exchange experience, ideas, and solutions for their problems in theoretical aspects of computing such as automata theory and formal languages, principles and semantics of programming languages, software architectures and their description languages, software specification, refinement, and verification, model checking and theorem proving, real-time, embedded and hybrid systems, theory of parallel, distributed, and internet-based (grid) computing, simulation and modeling, and service-oriented development.

Software engineering requires specialized knowledge of a broad spectrum of topics, including the construction of software and the platforms, applications, and environments in which the software operates as well as an understanding of the people who build and use the software. Offering an authoritative perspective, the two volumes of the *Encyclopedia of Software Engineering* cover the entire multidisciplinary scope of this important field. More than 200 expert contributors and reviewers from industry and academia across 21 countries provide easy-to-read entries that cover software requirements, design, construction, testing, maintenance, configuration management, quality control, and software engineering management tools and methods. Editor Phillip A. Laplante uses the most universally recognized definition of the areas of relevance to software engineering, the Software Engineering Body of Knowledge (SWEBOK®), as a template for organizing the material. Also available in an electronic format, this encyclopedia supplies software engineering students, IT professionals, researchers, managers, and scholars with unrivaled coverage of the topics that encompass this ever-changing field. Also Available Online This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options Contact Taylor and Francis for more information or to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367; (E-mail) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062; (E-

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This book addresses selected topics in electrical engineering, electronics and mechatronics that have posed serious challenges for both the scientific and engineering communities in recent years. The topics covered range from mathematical models of electrical and electronic components and systems, to simulation tools implemented for their analysis and further developments; and from multidisciplinary optimization, signal processing methods and numerical results, to control and diagnostic techniques. By bridging theory and practice in the modeling, design and optimization of electrical, electromechanical and electronic systems, and by adopting a multidisciplinary perspective, the book provides researchers and practitioners with timely and extensive information on the state of the art in the field — and a source of new, exciting ideas for further developments and collaborations. The book presents selected results of the XIII Scientific Conference on Selected Issues of Electrical Engineering and Electronics (WZEE 2016), held on May 04–08, 2016, in Rzeszów, Poland. The Conference was organized by the Rzeszów Division of Polish Association of Theoretical and Applied Electrical Engineering (PTETiS) in cooperation with the Faculty of Electrical and Computer Engineering of the Rzeszów University of Technology.

CENELEC EN 50128 and IEC 62279 standards are applicable to the performance of software in the railway sector. The 2011 version of the 50128 standard firms up the techniques and methods to be implemented. This is a guide to its implementation, in order to understand the foundations of the standard and how it impacts on the activities to be undertaken, helping towards better a preparation for the independent evaluation phase, which is mandatory.

1 This volume contains the research papers and invited papers presented at the Third International Conference on Tests and Proofs (TAP 2009) held at ETH Zurich, Switzerland, during July 2–3, 2009. The TAP conference is devoted to the convergence of proofs and tests. It combines ideas from both sides for the advancement of software quality. To prove the correctness of a program is to demonstrate, through impeccable mathematical techniques, that it has no bugs; to test a program is to run it with the expectation of discovering bugs. The two techniques seem contradictory: if you have proved your program, it is fruitless to comb it for bugs; and if you are testing it, that is surely a sign that you have given up on any hope of proving its correctness. Accordingly, proofs and tests have, since the onset of software engineering research, been pursued by distinct communities using rather different techniques and tools. And yet the development of both approaches leads to the discovery of common issues and to the realization that each may need the other. The emergence of model checking has been one of the first signs that contradiction may yield to complementarity, but in the past few years an increasing number of research efforts have encountered the need for combining proofs and tests, dropping earlier dogmatic views of incompatibility and taking instead the best of what each of these software engineering domains has to offer.

Railway Safety, Reliability, and Security: Technologies and Systems Engineering IGI Global

A presentation of real examples of industrial uses for formal methods such as SCADE, the B-Method, ControlBuild, Matelo, etc. in various fields, such as railways, aeronautics, and the automotive industry, the purpose of this book is to present a summary of experience on the use of these “formal methods” (such as proof and model-checking) in industrial examples of complex systems. It is based on the experience of people who are currently involved in the creation and evaluation of safety critical system software. The involvement of people from within the industry allows us to avoid the usual problems of confidentiality which could arise and thus enables us to supply new useful information (photos, architecture plans, real examples, etc.).

In recent years, a considerable amount of effort has been devoted, both in industry and academia, to the development, validation and verification of critical systems, i.e. those systems whose malfunctions or failures reach a critical level both in terms of risks to human life as well as having a large economic impact. Certifications of Critical Systems - The CECRIS Experience documents the main insights on Cost Effective Verification and Validation processes that were gained during work in the European Research Project CECRIS (Certification of Critical Systems). The objective of the research was to tackle the challenges of certification by focusing on those aspects that turn out to be more difficult/important for current and future critical systems industry: the effective use of methodologies, processes and tools. Starting from both the scientific and industrial state of the art methodologies for system development and the impact of their usage on the verification and validation and certification of critical systems, the project aimed at developing strategies and techniques supported by automatic or semi-automatic tools and methods for these activities, setting guidelines to support engineers during the planning of the verification and validation phases.

This book constitutes the refereed proceedings of the First International Conference on Reliability, Safety, and Security of Railway Systems, RSSRail 2016, held in Paris, France, in June 2016. The 15 revised full papers presented were carefully reviewed and selected from 36 initial submissions. The papers cover a wide range of topics including failure analysis, interlocking verification, formal system specification and refinement, security analysis of ERTMS, safety verification, formalisation of requirements, proof automation, operational security, railway system reliability, risk assessment for ERTMS, and verification of EN-50128 safety requirements.

This book constitutes the proceedings of the 12th International Conference on Transport Systems Telematics, TST 2012, held in Katowice-Ustron, Poland, in October 2012. The 48 papers included in this volume were carefully reviewed and selected for inclusion in this book. Transport telematics are the systems using the information and communication technologies in the area of infrastructure and of means of transport and its participants. An intelligent transport covers systems that allow, through the data transmission and analysis, to influence the behaviour of road users and the action of technical elements in means of transport or along the traffic route. Intelligent transport systems - in accordance with the European Directive - are used for the transport management informatisation. The research shows that the use of telematics can significantly increase the efficiency of the transport system, the road safety and the environmental protection. This book provides an overview of solutions being developed in the field of intelligent transportation systems, and includes theoretical and case studies in the countries of conference participants.

It is always a special honor to chair the European Dependable Computing Conference (EDCC). EDCC has become one of the well-established conferences in the field of dependability in the European research area. Budapest was selected as the host of this conference due to its traditions in organizing international scientific events and its traditional role of serving as a meeting point between East and West. EDCC-5 was the 5th in the series of these high-quality scientific conferences. In addition to the overall significance of such a pan-European event, this year's conference was a special one due to historic reasons. The roots of EDCC date back to the moment when the Iron Curtain fell. Originally, two groups of scientists from different European countries in Western and Eastern Europe – who were active in research and education related to dependability created a – joint forum in order to merge their communities as early as in 1989. This trend has continued up to today. This year's conference was the first one where the overwhelming majority of the research groups belong to the family of European nations united in the European Union. During the past 16 years we observed that the same roots in all the

professional, cultural and scientific senses led to a seamless integration of these research communities previously separated artificially for a long time. EDCC has become one of the main European platforms to exchange new - search ideas in the field of dependability.

Human errors, as well as deliberate sabotage, pose a considerable danger to passengers riding on the modern railways and have created disastrous consequences. To protect civilians against both intentional and unintentional threats, rail transportation has become increasingly automated. Railway Safety, Reliability, and Security: Technologies and Systems Engineering provides engineering students and professionals with a collection of state-of-the-art methodological and technological notions to support the development and certification of 'real-time safety-critical' railway control systems, as well as the protection of rail transportation infrastructures.

This book constitutes the refereed proceedings of the 23rd IFIP WG 6.1 International Conference on Testing Software and Systems, ICTSS 2011, held in Paris, France, in November 2011. The 13 revised full papers presented together with 2 invited talks were carefully selected from 40 submissions. The papers address the conceptual, theoretic, and practical problems of testing software systems, including communication protocols, services, distributed platforms, middleware, controllers, and security infrastructures. The Handbook of RAMS in Railway Systems: Theory and Practice addresses the complexity in today's railway systems, which use computers and electromechanical components to increase efficiency while ensuring a high level of safety. RAM (Reliability, Availability, Maintainability) addresses the specifications and standards that manufacturers and operators have to meet. Modeling, implementation, and assessment of RAM and safety requires the integration of railway engineering systems; mathematical and statistical methods; standards compliance; and financial/economic factors. This Handbook brings together a group of experts to present RAM and safety in a modern, comprehensive manner.

This book constitutes the refereed proceedings of 6 workshops co-located with SAFECOMP 2014, the 33rd International Conference on Computer Safety, Reliability, and Security, held in Florence, Italy, in September 2014. The 32 revised full and 10 short papers presented were carefully reviewed and selected from 58 submissions. They are complemented with 6 introduction to each of the workshops: Architecting Safety in Collaborative Mobile Systems, ASCoMS'14; ERCIM/EWICS/ARTEMIS Workshop on Dependable Embedded and Cyberphysical Systems and Systems-of-Systems, DECSoS'14; DEvelopment, Verification and VALIDation of cRiTical Systems, DEVVARTS'14; Integration of Safety and Security Engineering, ISSE'14; Reliability and Security Aspects for Critical Infrastructure Protection, ReSA4CI'14; Next Generation of System Assurance Approaches for Safety-Critical Systems, SASSUR'14.

This volume features the proceedings of the Eleventh International Conference on Computer System Design and Operation in the Railway and other Transit Systems. It provides the latest information on the use of computer-based techniques, and promotes a general awareness of these throughout the business management, design, manufacture and operation of railways and other advanced passenger, freight and transit systems. Of interest to railway managers, consultants, railway engineers (including signal and control engineers), designers of advanced train systems and computer specialists, the proceedings will also be of interest to planners of railway network systems, manufacturers of the track, rolling stock, locomotives and other ancillary equipment and systems; who all have a common interest in the development and application of computer techniques for the solution of problems in the railway and other mass transit systems. Papers included in this volume cover the following topics: Planning; Safety and security; Passenger interface systems; Decision support systems, Computer techniques; Driverless operations; Advanced train control; Train location; Dynamic train regulations; Timetable planning; Operations quality; Communications, Energy management; Power supply; Dynamics and wheel/rail interface; Freight; Condition monitoring; Asset management; Maglev and high speed railway.

Adoption and Optimization of Embedded and Real-Time Communication Systems presents innovative research on the integration of embedded systems, real-time systems and the developments towards multimedia technology. This book is essential for researchers, practitioners, scientists, and IT professionals interested in expanding their knowledge of this interdisciplinary field.

This book presents real-world examples of formal techniques in an industrial context. It covers formal methods such as SCADE and/or the B Method, in various fields such as railways, aeronautics, and the automotive industry. The purpose of this book is to present a summary of experience on the use of "formal methods" (based on formal techniques such as proof, abstract interpretation and model-checking) in industrial examples of complex systems, based on the experience of people currently involved in the creation and assessment of safety critical system software. The involvement of people from within the industry allows the authors to avoid the usual confidentiality problems which can arise and thus enables them to supply new useful information (photos, architecture plans, real examples, etc.).

This book constitutes the refereed proceedings of the Joint 21st International Workshop on Formal Methods for Industrial Critical Systems and the 16th International Workshop on Automated Verification of Critical Systems, FMICS-AVoCS 2016, held in Pisa, Italy, in September 2016. The 11 full papers and 4 short papers presented together with one invited talk were carefully reviewed and selected from 24 submissions. They are organized in the following sections: automated verification techniques; model-based system analysis; and applications and case studies.

"This book provides integrated chapters on software engineering and enterprise systems focusing on parts integrating requirements engineering, software engineering, process and frameworks, productivity technologies, and enterprise systems"--Provided by publisher.

This book contains the proceedings of the Fourth International Workshop on Product Family Engineering, PFE-4, held in Bilbao, Spain, October 3–5, 2001. This workshop was the fourth in a series started in

1996, with the same subject, software product-family engineering. Proceedings of the second and third workshops have been published as LNCS 1429 and LNCS 1951. The workshops were organized within co-operation projects of European industry, the first two by ARES (Esprit IV 20.477) 1995–1999. This project had three industrial and three academic partners, and focused on software architectures for product families. Some of the partners continued in ITEA project 99005, ESAPS (1999–2001). ITEA is the software development program (?!2023) within the European Eureka initiative. ITEA projects last for two years and ESAPS was succeeded by CAFE (ITEA ip00004), which started in 2001 and will terminate in 2003. This workshop was initially prepared within ESAPS and the preparation continued in CAFE. Due to the attacks in the USA of September 11, several people were not able to fly and therefore did not show up. However, we have included their submissions in these proceedings. The session chair presented these submissions, and their inputs were used during the discussions. It was planned that Henk Obbink be workshop chair, and Linda Northrop and Sergio Bandinelli be co-chairs. However, because of personal circumstances Henk Obbink was not able to leave home during the workshop. Moreover both co-chairs had already enough other duties. Therefore the chairing duties were taken over by the program chair, Frank van der Linden.

This book constitutes the refereed proceedings of the 10th International Conference on Tests and Proofs, TAP 2016, held as part of STAF 2016, in Vienna, Austria, in July 2016. The 8 full papers, 2 short papers, and 1 tool demonstration paper presented in this volume were carefully reviewed and selected from 19 submissions. The book also contains one invited talk in full-paper length. The TAP conference promotes research in verification and formal methods that targets the interplay of proofs and testing: the advancement of techniques of each kind and their combination, with the ultimate goal of improving software and system dependability.

This book constitutes the refereed proceedings of the Third International Workshop on Formal Techniques for Safety-Critical Systems, FTSCS 2014, held in Luxembourg, in November 2014. The 14 revised full papers presented together with two invited talks were carefully reviewed and selected from 40 submissions. The papers address various topics related to the application of formal and semi-formal methods to improve the quality of safety-critical computer systems.

This book constitutes the refereed proceedings of the Fourth International Symposium on NASA Formal Methods, NFM 2012, held in Norfolk, VA, USA, in April 2012. The 36 revised regular papers presented together with 10 short papers, 3 invited talks were carefully reviewed and selected from 93 submissions. The topics are organized in topical sections on theorem proving, symbolic execution, model-based engineering, real-time and stochastic systems, model checking, abstraction and abstraction refinement, compositional verification techniques, static and dynamic analysis techniques, fault protection, cyber security, specification formalisms, requirements analysis and applications of formal techniques.

This book constitutes the refereed proceedings of the 21st International Symposium on Formal Methods, FM 2016, held in Limassol, Cyprus, in November 2016. The 38 full papers and 11 short papers presented together with one abstract of an invited talk and one invited presentation were carefully reviewed and selected from 162 submissions. The broad topics of interest for FM include: interdisciplinary formal methods; formal methods in practice; tools for formal methods; role of formal methods in software and systems engineering; theoretical foundations.

The rail-based transit system is a popular public transportation option, not just with members of the public but also with policy makers looking to install a form of convenient and rapid travel. Even for moving bulk freight long distances, a rail-based system is the most sustainable transportation system currently available. The Handbook of Research on Emerging Innovations in Rail Transportation Engineering presents the latest research on next-generation public transportation infrastructures. Emphasizing a diverse set of topics related to rail-based transportation such as funding issues, policy design, traffic planning and forecasting, and engineering solutions, this comprehensive publication is an essential resource for transportation planners, engineers, policymakers, and graduate-level engineering students interested in uncovering research-based solutions, recommendations, and examples of modern rail transportation systems.

This book presents the lecture notes of the 1st Summer School on Methods and Tools for the Design of Digital Systems, 2015, held in Bremen, Germany. The topic of the summer school was devoted to modeling and verification of cyber-physical systems. This covers several aspects of the field, including hybrid systems and model checking, as well as applications in robotics and aerospace systems. The main chapters have been written by leading scientists, who present their field of research, each providing references to introductory material as well as latest scientific advances and future research directions. This is complemented by short papers submitted by the participating PhD students.

This book is a methodological approach to the goal-based safety design procedure that will soon be an international requirement. This is the first single volume book to describe how to satisfy safety goals by modern reliability engineering. Its focus is on the quantitative aspects of the international standards using a methodological approach. Case studies illustrate the methodologies presented.

This book constitutes the refereed proceedings of the 25th IFIP WG 6.1 International Conference on Testing Software and Systems, ICTSS 2013, held in Istanbul, Turkey, in November 2013. The 17 revised full papers presented together with 3 short papers were carefully selected from 68 submissions. The papers are organized in topical sections on model-based testing, testing timed and concurrent systems, test suite selection and effort estimation, tools and languages, and debugging.

This book constitutes the refereed proceedings of the 35th International Conference on Computer Safety, Reliability, and Security, SAFECOMP 2016, held in Trondheim, Norway, in September 2016. The 24 revised full papers presented were carefully reviewed and selected from 71 submissions. The papers are organized in topical sections on fault injection, safety assurance, formal verification, automotive, anomaly detection and resilience, cyber security, fault trees, and safety analysis.

This book provides comprehensive coverage of the dependability challenges in today's advanced computing systems. It is an in-depth discussion of all the technological and design-level techniques that may be used to overcome these issues and analyzes various dependability-assessment methods. The impact of individual application scenarios on the definition of challenges and solutions is considered so that the designer can clearly assess the problems and adjust the solution based on the specifications in question. The book is composed of three sections, beginning with an introduction to current dependability challenges arising in complex computing systems implemented with nanoscale technologies, and of the effect of the application scenario. The second section details all the fault-tolerance techniques that are applicable in the manufacture of reliable advanced computing devices. Different levels, from technology-level fault avoidance to the use of error correcting codes and system-level checkpointing are introduced and explained as applicable to the different application scenario requirements. Finally the third section proposes a roadmap of future trends in and perspectives on the dependability and manufacturability of advanced computing systems from the special point of view of industrial stakeholders. Dependable Multicore Architectures at Nanoscale showcases the original ideas and concepts introduced into the field of nanoscale manufacturing and systems reliability over nearly four years of work within COST Action IC1103 MEDIAN, a think-tank with participants from 27 countries. Academic researchers and graduate students working in multi-core computer systems and their manufacture will find this book of interest as will industrial design and manufacturing engineers working in VLSI companies.

The two-volume set LNCS 9952 and LNCS 9953 constitutes the refereed proceedings of the 7th International Symposium on Leveraging Applications of Formal Methods, Verification and Validation, ISoLA

2016, held in Imperial, Corfu, Greece, in October 2016. The papers presented in this volume were carefully reviewed and selected for inclusion in the proceedings. Featuring a track introduction to each section, the papers are organized in topical sections named: statistical model checking; evaluation and reproducibility of program analysis and verification; ModSyn-PP: modular synthesis of programs and processes; semantic heterogeneity in the formal development of complex systems; static and runtime verification: competitors or friends?; rigorous engineering of collective adaptive systems; correctness-by-construction and post-hoc verification: friends or foes?; privacy and security issues in information systems; towards a unified view of modeling and programming; formal methods and safety certification: challenges in the railways domain; RVE: runtime verification and enforcement, the (industrial) application perspective; variability modeling for scalable software evolution; detecting and understanding software doping; learning systems: machine-learning in software products and learning-based analysis of software systems; testing the internet of things; doctoral symposium; industrial track; RERS challenge; and STRESS.

These days, more and more software development projects are being carried out using agile methods like Scrum. Agile software development promises higher software quality, a shorter time to market, and improved focus on customer needs. However, the transition to working within an agile methodology is not easy. Familiar processes and procedures change drastically. Software testing and software quality assurance have a crucial role in ensuring that a software development team, department, or company successfully implements long-term agile development methods and benefits from this framework. This book discusses agile methodology from the perspective of software testing and software quality assurance management. Software development managers, project managers, and quality assurance managers will obtain tips and tricks on how to organize testing and assure quality so that agile projects maintain their impact. Professional certified testers and software quality assurance experts will learn how to work successfully within agile software teams and how best to integrate their expertise. Topics include: Agile methodology and classic process models How to plan an agile project Unit tests and test first approach Integration testing and continuous integration System testing and test nonstop Quality management and quality assurance Also included are five case studies from the manufacturing, online-trade, and software industry as well as test exercises for self-assessment. This book covers the new ISTQB Syllabus for Agile Software Testing and is a relevant resource for all students and trainees worldwide who plan to undertake this ISTQB certification.

Achieving Systems Safety contains papers presented at the twentieth annual Safety-critical Systems Symposium, held in Bristol, UK, in February 2012. The Symposium is for engineers, managers and academics in the field of system safety, across all industry sectors, so the papers making up this volume offer a wide-ranging coverage of current safety topics, and a blend of academic research and industrial experience. They include both recent developments in the field and discussion of open issues that will shape future progress. The topics covered by the 20 papers in this volume include vulnerabilities in global navigation satellite systems; safety culture and community; transport safety; cyber-attacks on safety-critical systems; improving our approach to systems safety; accidents; assessment, validation and testing; safety standards and safety levels. The book will be of interest to both academics and practitioners working in the safety-critical systems arena.

This volume constitutes the proceedings of the Second International Conference on Reliability, Safety and Security of Railway Systems, RRSRail 2017, held in Pistoia, Italy, in November 2017. The 16 papers presented in this volume were carefully reviewed and selected from 34 submissions. They are organized in topical sections named: communication challenges in railway systems; formal modeling and verification for safety; light rail and urban transit; and engineering techniques and standards. The book also contains one keynote talk in full-paper length.

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