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Nota di contenuto	Preface -- Invited Talks -- Organisation -- Contents -- Risk-Aware On-the-Fly Solving of Physical Vehicle Routing Problems -- 1 Introduction -- 2 Related Work -- 3 Towards a Problem Formulation -- 4 Complexity Considerations -- 5 Implementation Considerations -- 6 Experiments -- 7 Conclusion -- References -- Agents as a Design Paradigm for Robotic Systems Leveraging ROS and Gazebo -- 1 Introduction -- 2 Related Work -- 3 Design Concepts and the Agent Paradigm -- 4 Developing Robotic Systems with ROS and Gazebo -- 5 Agents for ROS and Gazebo Designing -- 5.1 Case Study and Validation -- 6 Conclusions -- References -- Verification-Oriented Specification of Multi-agent Interaction Patterns -- 1 Introduction -- 2 Related Work -- 3 Background -- 4 Illustrative Example -- 5 Translating LIrAs patterns to SHA -- 5.1 Hierarchical LIrAs Pattern Structure -- 5.2 DFA Representation
Sommario/riassunto	This book is a collection of proceedings from the 4th Workshop on Agents and Robots for Reliable Engineered Autonomy (AREA 2024), held in Santiago de Compostela, Spain. It focuses on the intersection of autonomous agents, robotics, and software engineering, highlighting the challenges and solutions in developing reliable autonomous

systems. Topics include agent-based modular architectures, software engineering for robotic development, and formal verification of multi-agent systems. The workshop aims to enhance understanding and showcase applications in engineering intelligent agents and multi-agent systems, with discussions led by experts in strategic reasoning and automated planning.