

**2023 IEEE/ACM 5th
International Workshop on
Robotics Software Engineering
(RoSE 2023)**

**Melbourne, Australia
15 May 2023**



**IEEE Catalog Number: CFP23P89-POD
ISBN: 979-8-3503-0185-4**

**Copyright © 2023 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP23P89-POD
ISBN (Print-On-Demand):	979-8-3503-0185-4
ISBN (Online):	979-8-3503-0184-7

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2023 IEEE/ACM 5th International Workshop on Robotics Software Engineering (RoSE) **RoSE 2023**

Table of Contents

2023 IEEE/ACM 5th International Workshop on Robotics Software Engineering (RoSE)

Towards the Concept of Trust Assurance Case	1
<i>Emilia Cioroica (Fraunhofer IESE), Barbora Buhnova (Masaryk University), Daniel Schneider (Fraunhofer IESE), Emrah Tomur (Ericsson), Ioannis Sorokos (Fraunhofer IESE), and Thomas Kuhn (Fraunhofer IESE)</i>	
Enhancing the technological maturity of robot swarms	5
<i>Darko Bozhinoski (IRIDIA, Universite Libre de Bruxelles) and Mauro Birattari (IRIDIA, Universite Libre de Bruxelles)</i>	
Survey on Robotic Systems Integration	9
<i>Nadia Hammoudeh Garcia (Fraunhofer Institute for Manufacturing Engineering and Automation (IPA), Germany) and Andreas Wortmann (University of Stuttgart, Germany)</i>	
An Analysis of Behaviour-Driven Requirement Specification for Robotic Competitions	17
<i>Minh Nguyen (Hochschule Bonn-Rhein-Sieg, Germany), Nico Hochgeschwender (Hochschule Bonn-Rhein-Sieg, Germany), and Sebastian Wrede (Bielefeld University, Germany)</i>	
EDDE: An Event-Driven Data Exchange to Accurately Introspect Cobot Applications	25
<i>Emil Stubbe Kolvig-Raun (Universal Robots, University of Southern Denmark), Mikkel Baun Kjærgaard (University of Southern Denmark), and Ralph Brorsen (Universal Robots, Denmark)</i>	
Lifting ROS to Model-Driven Development: Lessons Learned from a bottom-up approach	31
<i>Nadia Hammoudeh Garcia (Fraunhofer Institute for Manufacturing Engineering and Automation (IPA), Germany), Andreas Wortmann (University of Stuttgart, Germany), Harshavardhan Deshpande (Fraunhofer Institute for Manufacturing Engineering and Automation (IPA), Germany), Ruichao Wu (Fraunhofer Institute for Manufacturing Engineering and Automation (IPA), Germany), and Björn Kahl (Fraunhofer Institute for Manufacturing Engineering and Automation (IPA), Germany)</i>	

Getting Started with ROS2 Development: A Case Study of Software Development Challenges	37
<i>Paulius Daubaris (University of Helsinki, Finland), Simo Linkola (University of Helsinki, Finland), Anna Kantosalo (University of Helsinki, Finland), and Niko Mäkitalo (University of Helsinki, Finland)</i>	
UAV Inspection of Large Components: Determination of Alternative Inspection Points and Online Route Optimization	45
<i>Martin Schörner (Augsburg University), Constantin Wanninger (Augsburg University), Raphael Katschinsky (Augsburg University), Simon Hornung (Augsburg University), Christian Eymüller (Augsburg University), Alexander Poeppl (Augsburg University), and Wolfgang Reif (Augsburg University)</i>	
ROMoS: Flexible Runtime Monitoring Support for ROS-based Applications	53
<i>Marco Stadler (Johannes Kepler University Linz, Austria) and Michael Vierhauser (Johannes Kepler University Linz, Austria)</i>	
EzSkiROS: A Case Study on Embedded Robotics DSLs to Catch Bugs Early	61
<i>Momina Rizwan (Lund University), Ricardo Caldas (Chalmers University of Technology), Christoph Reichenbach (Lund University), and Matthias Mayr (Lund University)</i>	
Augmenting Robot Software Development Process with Flexbot	69
<i>Paulius Daubaris (University of Helsinki, Finland), Juhana Helovuori (Atostek Oy, Finland), and Niko Mäkitalo (University of Helsinki, Finland)</i>	
Author Index	73