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Alberto Finzi (Eds.)

Proceedings of the  
**AIRO 2022**  
**The 9th Italian Workshop on**  
**Artificial Intelligence and Robotics**

Workshop co-located with AIXIA 2022  
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## Preface

The goal of the Italian workshop series on Artificial Intelligence and Robotics (AIRO) is to present, discuss and assess recent advances in the deployment of Artificial Intelligence (AI) methods in Robotics. AI principles and methods play a crucial role in several areas of the robotics research (e.g. field, service, social robotics, etc.) and are pervasively exploited at various levels of robot architectures for different purposes: sensing and perception, reasoning and decision, learning, intelligent control, adaptive and social behavior, verification and validation methods, etc. Starting from these diverse -yet intertwined- research fields, the AIRO workshop series aims at providing an established long-term Italian forum where the AI community and the Robotics community may find an interesting and stimulating common ground.

This volume contains the proceedings of the 9th edition of the AIRO workshop<sup>1</sup>, which was held on 30 November 2022 in conjunction with the 21th International Conference of the Italian Association for Artificial Intelligence (AIxIA 2022). This edition of the AIRO workshop accepted 17 papers (16 included in this volume, 15 as short papers, one as a poster) involving 67 authors. The program was structured into seven sections: *Human-Robot Interaction*, *Social Robotics*, *Planning*, *Learning and Robotics*, *Multi-robots*, *Perception and Navigation*, *Industrial Robotics and Applications*, and a final panel. The contributions covered several aspects of AI and Robotics in the areas of industrial, surgical, service and social robotics, they were mainly concerned with the following research topics: human-robot interaction, robot learning, robot planning, robot perception, multi-robots, cloud robotics, ontologies, robot navigation.

The workshop program also included a final panel session on *Artificial Intelligence for Robotics: Effectiveness, Limits and Prospects* organized in collaboration with SIRI (Associazione Italiana di Robotica ed Automazione). The panel was coordinated and moderated by Alessandro Farinelli and Alberto Finzi (AIRO side) jointly with Enrico Pagello (SIRI side) involving invited speakers from both the industry and the university: Giulio Farina (CEO, Salvagnini Robotica), Stefano Tonello (President of BOD, IT+Robotics), Nicola Castaman (IT+Robotics), Francesco Amigoni (Politecnico di Milano), Alessandro Farinelli (Università di Verona), Andrea Orlandini (ISTC-CNR).

The research topics and the results collected in these proceedings illustrate the work of an active and multidisciplinary research community and confirm the growing interest in a forum where AI and Robotics researchers can find a common ground.

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Workshop Organizers

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<sup>1</sup> <https://www.airo-aixia.it/airo2022/>

## Workshop Organization

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Gloria Beraldo	ISTC- CNR
Luca Buoncompagni	University of Genoa
Alberto Castellini	University of Verona
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