SHAREWORK TRAINING COURSE

# #4 ROBOT AND HUMAN MOTION PLANNING IN COLLABORATIVE ROBOTICS

## INTRODUCTION

Robot and human path planning is essential for the implementation of accurate, safe and effective Human-Robot Collaboration (HRC) systems, making sure to avoid incidents in the workplace, as well as increase productivity and work quality thanks to the collaboration between workers and robots.

In this online course on motion planning in Human-Robot Collaboration, students will learn about state-of-the-art approaches for robot planning and scheduling, as well as advances in the field with great potential to contribute to a widespread uptake of high-payload collaborative industrial robots in assembly shopfloors. As part of the training course, a hierarchical motion planning framework to plan and execute human-aware movements and research on human motion prediction applicable into robot motion planning is taught.

## TOPICS

- The latest research on collaborative robotics task planning and scheduling for a safe workplace.
- Understanding the importance of human-aware planning, current limitations and opportunities.
- Human motion prediction approaches for their application in Human-Robot Collaboration solutions.

Please register on the platform in order to access the training course.

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## TARGETED TO

- The latest research on collaborative robotics task planning and scheduling for a safe workplace.
- Understanding the importance of human-aware planning, current limitations, and opportunities.
- Human motion prediction approaches for their application in Human-Robot Collaboration solutions.

## SPEAKERS

### MARCO FARONI, RESEARCHER, CNR-STIIMA

Marco Faroni (MSc 2015, PhD 2019) is a researcher at CNR-STIIMA. His research activity focuses on motion planning of robotic manipulators, combined task and motion planning, and human-robot collaboration in industrial scenarios. He has led the motion planning and task-and-motion-planning tasks of the projects H2020-ICT-Pickplace and H2020-FoF-Sharework for CNR-STIIMA, which deal with online, optimal motion planning and the combination of task planning and motion planning methods for effective human-robot collaboration.

### ALESSANDRO UMBRICO, RESEARCHER, ISTC-CNR

Researcher working at the Institute of Cognitive Sciences and Technologies (ISTC-CNR), in Rome. He received his PhD in 2007 on Computer Science and Automation at University “Roma TRE”. He is currently studying Socially Assistive Robotics and Human-Robot Collaboration Scenarios, pursuing the design and development of novel cognitive approaches aimed at tightly integrating the above mentioned techniques and endowing artificial agents with the reasoning capabilities needed to adapt their behaviors to the changing dynamics of real world scenarios.

### JULEN URAIN, PHD CANDIDATE, TECHNICAL UNIVERSITY DARMSTADT

Julen Urain M.Sc. is a fourth year Phd candidate in the Intelligent Autonomous Systems group in Technical Universitat Darmstadt (TUDa). His main fields of research are imitation learning and density estimation for robot motion generation. His main contribution in Sharework is in the field of building gesture and motion models to represent and predict human motion.