



## SHAREWORK TRAINING COURSE

# #2 HUMAN FACTORS IN EFFECTIVE HUMAN-ROBOT COLLABORATION

### INTRODUCTION

In recent years, manufacturing aimed at increasing flexibility, while maintaining productivity for satisfying emerging market needs for higher product customization. Human Robot Collaboration (HRC) is a promising way of achieving this balance by combining the improvisation and dexterity of humans with robots' tireless precision and repeatability.

However, collaborative robotics developments have focused primarily on the technology and, until recently, little research has been geared to understand the key human factors that need to be considered to enable successful implementation of industrial HRC.

This training course is focused on Human Factor approaches in collaborative robotics from several perspectives. Contents of this session responded to how to develop a more human-centered design for the factory of the future, including ergonomic and posture assessments, methodologies to ensure adaptability and acceptance of collaborative robotics solutions in the workplace, the use of Augmented Reality for operator training and technology for a seamless interaction between humans and cobots.

### TOPICS

- Overview of general ergonomics principles, requirements and concepts for new ergonomic assessment approaches.
- How to support adaptation and acclimatization of operators through a training framework based on Augmented Reality (AR) technology.
- Understanding the human-factors methodology necessary to optimize the impact of a cobotic solution on end-users.
- Challenges and requirements for interaction frameworks and introduction to the SHAREWORK's multi-modal interaction framework.

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## TARGETED TO

- Undergraduate, graduate or master students willing to learn about the application and need to integrate human factors in robotics, Augmented Reality (AR) training solutions in industry 4.0 shopfloors, ergonomics and posture assessments, Human-Machine interaction, etc.
- Researchers in Human-Robot Collaboration, Human Factors and Human-Robot Interaction, among others from universities and research centers.
- Professionals from companies in the field of robotics, AR or Industry 4.0.

## SPEAKERS

### **PAUL EICHLER, HEAD OF GROUP HUMAN-MACHINE-INTERACTION, FRAUNHOFER IWU**

Paul Eichler received the B.Sc. and M.Sc. degree in Medical Engineering from the “Chemnitz University of Technology” (TUC), Chemnitz, Germany, in 2015 and 2017; and respectively. He worked as a Research Assistant in the Department of Robotics being involved in different R&D projects. Since 2021 he is Head of Group Human-Machine-Interaction within the Department of Cognitive Human-Machine-Systems at the Fraunhofer IWU. His research activities focus on the design of safe, highly efficient and effective human-machine production systems and in particular human-robot-cooperation and interaction.

### **DIONISIS ANDRONAS, RESEARCH ENGINEER, LABORATORY FOR MANUFACTURING SYSTEMS AND AUTOMATION (LMS)**

Dionisis Andronas holds a Bachelor’s and Master’s in Mechanical Engineering and Aeronautics from the university of Patras (Greece) in 2018. He works as a research engineer at the “Robots, Automation and Virtual Reality in Manufacturing” group of Laboratory for Manufacturing Systems and Automation (LMS). His research topics involve the design and development of hybrid production systems and cognitive mechatronic devices for reconfigurable manufacturing systems. His involvement in FP7 LIAA and H2020 projects VERSATILE, MERGING and SHAREWORK concerns the designing of collaborative workstations, human system interfaces, model-based deformable object co-manipulation planners and innovative systems for material handling and assembly.

### **ALEXANDRA JAUNET, EUROPEAN PROJECT MANAGER, STRANE INNOVATION**

Alexandra Jaunet joined Strane in 2020 as project manager and business developer. Political science graduate, she joined Strane to work as planner and facilitator for seminars, webinars, and workshops on sustainable resources management. She is currently managing work packages for several European projects on governance and financial topics, on value chains in circular economy and on developing collective intelligence practices in collaborative robotics. She coordinates human factors research in the Sharework project based on cognitive and social science expertise.