

PROJECT START: January 2020

€36,000 +
€628,595 EIT
Funding

Requirements
Consolidation
03/2020

Design and
Modeling
05/2020

The Virtual
Manufacturing
Environment
09/2020

Nuggets
development
12/2020

Validation and
Dissemination
12/2020

CHALLENGE



Teaching & practice in the manufacturing field is:

- Expensive
- Cumbersome
- Dangerous

Challenges on:

- Efficiency
- Diversity
- Health



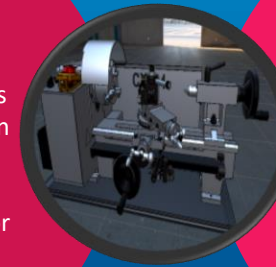
REAL

SOLUTION



A Virtual Manufacturing Environment (VME) for:

- Machinery and Robots (M&R) are modelled in Virtual Reality (VR)
- Safe practice and tailored experience for every practitioner
- Tracking of users' emotional response



VIRTUAL

BENEFITS



- Resilient M&R practices
- Democratization of VR simulation
- No gender and diversity discrimination
- Behavioural, physiological, and well-being at work monitoring & analysis

MAIN PROJECT RESULTS

8



VR-BASED NUGGETS
FOR THE GLP

100%

USABLE
EVERYWHERE



COVID-19

AN INSTRUMENT FOR
DISTANCE LEARNING



“ thanks to EIT for boosting this innovative and resilient shift in education ”



SILVIA GIORDANO

Professor at SUPSI

MAIN RESEARCH

Complex Networks and Pervasive Computing

AIM: Bringing the workers and students into the (virtual) manufacturing of the future



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INTEGRATION OF VR-BASED SIMULATION FOR THE SAFE INTERACTION AND PRACTICE OF STUDENTS AND WORKERS WITH MACHINERY AND ROBOTS



SUMMARY

In manufacturing, the teaching and practice of personnel often requires the interaction with expensive, cumbersome, and potentially dangerous Machinery and Robots (M&R). This challenge becomes increasingly more difficult when considering the efficiency, diversity, and health impact of the successful implementation of M&R applications.

To tackle these challenges, the V-Machina project aims at developing a Virtual Manufacturing Environment (VME) for the EIT M Guided Learning Platform (GLP). The VME is a simulated laboratory modelled via Virtual Reality (VR), where any student or practitioner can familiarize and safely practice with M&R. The VME is further enriched with gamification aspects and an activity recognition module aimed at recognizing users' emotional response to the training task.



OBJECTIVES

- Mentoring and guiding
- Automatic monitoring and feedback
- Resiliency
- Tailored experience
- Personalization with no diversity discrimination
- Haptic and gamification strategies to engage users
- Emotion recognition to track users' psychological indicators



VR MACHINERY AND ROBOTS

- Lathe machine
- Universal robot



PARADIGM SHIFTS IN EDUCATION

V-MACHINA will contribute to the manufacturing community and, more in general, to society by boosting three paradigmatic shifts in education, which we refer to as: LEARNING4ALL, ACCESS4ALL, and FEELING4ALL.

The **LEARNING4ALL** paradigm indicates the easy modelling of M&R by means of the instruments provided by the VME.

The **ACCESS4ALL** paradigm points to the possibility of offering a tailored experience via the VME, without any gender and diversity discrimination.

The **FEELING4ALL** paradigm encompasses the inclusion of emotions into the human-machine interaction, thus paving the way for an unprecedented virtual experience.

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