Smart and adaptive interfaces for INCLUSIVE work environment

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THE PROJECT

INCLUSIVE project aims at covering the increasing gap between machine complexity and user capabilities by developing a smart and innovative Human-Machine Interface HMI that accommodates to the workers’ skills and flexibility needs, by compensating their limitations (e.g. due to age, disability or inexperience) and by taking full advantage of their experience. Despite high levels of automation of machines and robots, humans remain central to manufacturing operations since they take charge of control and supervision of manufacturing activities. Human operators interact with machines and robots by means of HMI, which are unavoidably becoming very complex as new functions are implemented by the production system and include a wide range of possible operational modes and commands.

GOALS

Measure
Develop a HMI system able to measure the sustainable cognitive load of the human operator and her/his capability to accomplish automation tasks in cooperation with the production system.

Adapt
Design a HMI system aimed at adapting the automation functions and the information load of the production system to the measured capability of the user.

Train
Integrate a HMI, a virtual environment and an industrial social network to support and train low skilled operator to accomplish a complex automation task properly.

IMPACT

- Increase in adaptability, e.g. product customization capability.
- Quality increase in human and automation performance.
- Increased worker satisfaction and strengthened global position of industry in Europe through higher social acceptance levels.
- Wide adoption of the new work environment in advanced manufacturing systems.

USE CASES

INCLUSIVE system will be developed and validated in 3 different use cases:

- SCM produces woodworking machines for small companies and artisan shops.
- GIZELIS and SILVERLINES cooperate in developing robotic cells for panel bending.
- KHS produces filling and packaging solutions for big food companies worldwide.