

Use Case 12: User-friendly human-robot collaborative tasks programming.

Problem/goal	Intuitive programming of robotic applications using HMI, Speech, Planner and Teach by Demonstration. Such that a complete application can be made by stitching together, easily programmable subtasks/skills without the need of complex coding.
Potential users	SME's and large-scale industries that require flexible assembly solutions
NACE	C27 - Manufacture of electrical equipment; C26 - Manufacture of computer, electronic and optical products; C28 - Manufacture of machinery and equipment n.e.c.
Description	The idea is to demonstrate that assembly steps can be taught by an operator (instead of a programmer) to create/modify a robot application. The operator can program using a graphical interface or use speech to interact with the creation process. The operator can teach new trajectories to the robots using teach by demonstration, planner, vision, ... Once an application has been created, the operator can further modify it to better achieve the desired goal.
Hardware	Kuka iiwa, Robotiq gripper, Air Compressor components (workpiece), Vision system
Software	ROS/ROS2, Automappps, Nuance/Google, Halcon, Sunrise OS (Java)
Standards	ISO/TS 15066:2016, ISO 10218-1/2, ISA-95
Possible benefits	Large reduction in programming time (vendor-independent) that leads to cost saving. Required skills of operator to create robot applications is reduced. The functionalities are presented as add-on module that gives intuitive programming ability to any robot
Partners	Flanders Make (Belgium)

