Industrial Machinery

INDUSTRIAL MACHINERY

Wood machinery with the perception of the surrounding environment

DESCRIPTION

The demonstrator is based on a specific type of sensors that have been selected considering their cost, efficiency, and data rate.

The ultrasonic sensor grid can accurately detect the portion of the machinery area that can be occupied, from time to time, by humans. Of the different types of sensors that have been considered (video, laser scanner, etc.), the right compromise that fulfills the specific requirements was found in the matrix of ultrasonic sensors that have been chosen.

The demonstrator detects the presence of obstacles near a woodworking machine, slowing down or stopping the machine's cabinet in case of detection.

PARTNERS

BEYOND STATE-OF-THE-ART DEVELOPMENTS AND IMPACTS

The current approach to the human presence detection in the wood machinery field requires the machine to be nearly stopped for any detection of human presence in a large area surrounding the machinery, causing a significant delay in the production time. In the approach developed by the demonstrator, the refinement of the sensing and detecting capabilities is increased with the use of specific AI-based applications. These AI-based applications can guarantee a higher level of reliability of the detection while ensuring a fast response to the detection connecting the sensing and processing unit directly to the machinery and its controls.

INDUSTRIAL MACHINERY

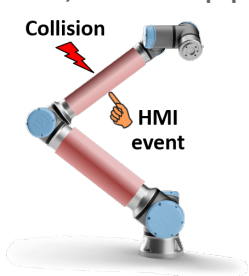
Smart robot with AI-based systems for manipulation and intuitive human-machine interaction

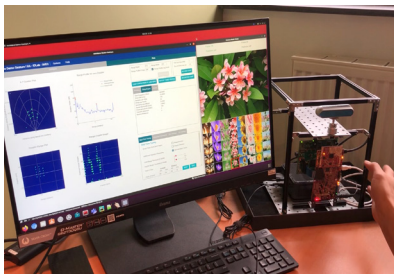
DESCRIPTION

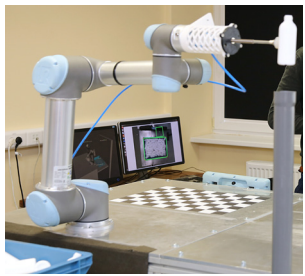
The Smart Robot demonstrator addresses challenges in enabling robots to «see», «feel», and interface with humans and the environment around them.

Enablement of these robot capabilities allows automating and rendering monotonous, dangerous, and resource-intensive work, raising public welfare and making people's lives safer and more convenient.

The Smart Robot demonstrator is a universal multi-modal cognitive sensing platform that can support different industries by synthetic real-life like data generation for AI-training, intuitive human-machine interaction, and usage of ROS for adaptability of different industrial robots, sensors, and other equipment.







PARTNERS

BEYOND STATE-OF-THE-ART DEVELOPMENTS AND IMPACTS

The developments are addressed in three directions connected to the stated challenges. A validation framework is proposed for allowing efficient and effective synthetic data generation and supporting deep analysis of AI-based CV algorithms. A new level of human-machine interface is proposed by developing millimetre-wave radar combined with AI to enable contactless manual control of a robot arm based on hand gestures. A new level of sensing is proposed by sensitive robotic skin enabling intuitive recognition of user commands by AI-based interpretation of position and force resolved detection of touch events. All these abilities are implemented in edge devices and unified in a joint demonstrator.