

FOREWORD

By combining the capabilities of the robot, such as precision and strength, with the dexterity and problem-solving ability of the human, it is possible to accomplish tasks that cannot be fully automated and improve the production quality and working conditions of employees. Our research has suggested that factory workers acknowledge this advantage. However, at the same time, we learned that they feared job loss due to the introduction of even more robots. This fear can hinder the social acceptance of such robots and people's desire to work with them. Therefore, during research on a cobot for a glue operation at Audi Brussels, we took a multidisciplinary and user-centred approach, leading to successful implementation. Together, we must explore new technologies and best practices to show how robots, as well as exoskeletons, can lead to better and healthier work - increasing the attractiveness of flexible manufacturing. Joint, cross-border projects with the industry that make this happen are paramount in this approach. COTEMACO is making use of some of the initially known best practices for cobot use and sharing these with regional SMEs while also taking into consideration the employee perspective and dealing with fears of job replacement.

Bram Vanderborght
Vrije Universiteit Brussel



Pandora's box for employees?

Interview with Dr. Matthias Vette-Steinkamp

Group Leader for Robotics and Human-Technology Interaction at ZeMA

Q: Why did you personally get involved in COTEMACO?

The technology transfer element of COTEMACO attracted me to participate in the project, in order to promote human-robot cooperation (HRC). Seeing that jobs and processes can be better designed and thus make SMEs more competitive is a great step towards the working world of the future. My professional training and studies in mechatronics have shown me many new possibilities of automation. But not every automation is economically or socially acceptable. This balancing act between innovative technologies, economic aspects and socially acceptable usage of technology makes the project so exciting for me.

Q: What is your biggest motivation in the project?

I would like to support companies in their transformation into the digital working world. HRC and new production technologies enable new ways of working. I see a lot of potential in these concepts. So far, many applications only work in research and I find it exciting to transfer these technologies into real production.

Q: Can you explain the main differences between a cobot and a traditional robot?

HRC is a new type of automation. It enables direct cooperation with a robot. However, conventional robots work in their own cages without the help of humans. Therefore, new robot systems have been developed that can detect a person in the robot's workspace via various internal or external sensors. To protect humans, the speed and force of the robots are reduced or additional sensors are installed - this prevents contact with the robot so no injuries occur. A big advantage of the new technology is the direct cooperation with the human being without a safety fence. For example, robotic systems can support employees with reduced performance or people with disabilities at work and allow them to actively participate in



Dr. Matthias Vette-Steinkamp: pioneering HRC

working life for longer. They compensate for the worker's lack of skills and support them in difficult tasks. But a robot can't do everything either. The cognitive and sensory abilities of humans are still needed, for example, in difficult assembly tasks.

Q: Where do you see ZEMA in 5 years? How is COTEMACO contributing to this vision?

ZeMA is set to become the main contact point for HRC because of our excellent research, technology transfer and participation networks. COTEMACO helps us gain further insights into areas of HRC through the cooperation

"We need to plan new production systems with a different division of labour - skill-based task sharing."

Dr. Matthias Vette-Steinkamp

of the various international project partners and to jointly develop complementary demonstrator landscapes. A give and take approach will lead the partners together in the field of HRC.

Q: How do you respond to the fear of robots "stealing" jobs?

HRC is often described as the holy grail of production for companies but Pandora's box for employees, which will destroy thousands of jobs. We don't see it that way. HRC is a special type of partial automation and can currently only be used sensibly and economically in a few cases. At present, the division of labour is very high so possibilities for direct human-robot cooperation are very limited. There is no need for robots and humans to work in the same work cell at the same time, there are either tasks for humans or for robots. In order to solve this and exploit the full potential of HRC, we need to plan new production systems with a different division of labour - skill-based task sharing. The robot takes over the tasks it can do well and the human takes over the tasks they can do well. It is important that human workers have enough activities so the workplace can remain attractive to potential workers. Such new workplace concepts can only work with the goodwill of the employee.

Update from Lead Partner

Mark Antonissen | Flanders Make

That's how we are ensuring the relevance of our propositions.

The first group of SMEs has already been involved in the project. We have organised several workshops for them across the project regions. During those meetings, we started compiling the joint challenges they face, which was the perfect opportunity to generate interest in the project and at the same time propose possible solutions through collaborative robotics. In total, we have welcomed over 100 SMEs already, largely exceeding our initial expectations.

As well as our own informative workshops for interested SMEs, our COTEMACO partners attended many conferences and workshops across North-West Europe and beyond. From AgriFoodTech in Den Bosch, the Netherlands, to RoboBusiness in Santa Clara, California. You can see our relevant upcoming events on [page 6](#).

The COTEMACO project is rolling and gaining pace very quickly now and the development of our field labs is well underway, with an expected launch in September. We are eager to get into contact with you, so we can assist you in incorporating this innovative technology into your manufacturing process. [Check out the robot-hub website for full information on the SME Support Programme](#) and come and meet us at one of the upcoming events.

Flanders Make is honoured to be able to represent the COTEMACO team in giving you a first update on the project and the activities so far. The first year has been quite a rollercoaster, completing a number of kick-off activities and laying the first stones for intense collaboration between the partners and SMEs in the region.

A lot of effort was put into creating the right **SME Support Programme** and other important foundations to make COTEMACO a success. The SME Support programme is the bread and butter of our project. The programme guides SMEs through the process of adopting collaborative robotic and shop floor digitalisation technologies, from the exploration of technological opportunities to the detailed definition of a business plan. It needs to be accessible, understandable and easy to use, so we're very proud of what we have created. This preliminary work has also given structure to the project and determined how, and which activities will be carried out over the next months and years. Because of the lengthy discussions with relevant automotive manufacturing and agro-food players in the field, we now have a pretty good understanding of where our target audience stands with automation.

"The programme guides SMEs through the process of adopting [cobot] technologies, from the exploration of technological opportunities to the detailed definition of a business plan."

Mark Antonissen



Don't wait any longer, our partners are at your service to get you on board!

FIELD LABS: An Introduction

Within the framework of COTEMACO, SMEs are being supported by introducing physical human-robot interaction (pHRI) and human-technology interaction (HTI) into their production processes. During the first phase of cooperation, participants will be informed about the state-of-the-art technology and the opportunities and risks of implementing it. In the next phase, they will be guided through setting up their own use cases. In general, semi-automation with pHRI is used to save time and costs in the assembly process through the parallel work of man and robot. A huge benefit of pHRI is, that the human and the Robot can do work tailored to their abilities. This makes the workplace more attractive for the worker, because repetitive, monotonous and unergonomic tasks will go to the robot.

An essential part of the project, and one of the first topics that we are dealing with is to raise awareness of cobots and assistant systems. In addition to expert talks, practice-oriented field lab tours are offered, i.e. the participants will test the robot applications hands-on. The cobot applications and assistant systems shown in the field labs should be used as a best practice for upcoming project partners.

Solutions and applications are customised to every company's needs. Some field labs can already present existing technological solutions, e.g. for the automotive industry in Germany (ZeMA Saarbrücken) and in Belgium (Flanders Make) and for the food industry in the UK (University of Lincoln). The field lab in the Netherlands at Food Tech Brainport will be equipped with entirely new demonstrators.

In the first part of the project, the challenges faced by SMEs in the two sectors were compiled, which we have collected in several surveys and listed. Each field lab now presents one or more practical solutions according to the most relevant and shared challenges from the regional SMEs. Complementary demonstrators will be created, serving as

Field lab solutions

- Semi-automation for quality improvement
- Loading and unloading, pick and place tasks
- Assembly processes (welding, gluing, assembly tasks, etc.)
- Easy and flexible robot programming
- Gripper
- Shared Workspace, collaboration with robots
- Vision, Periphery, Virtual fence, area monitoring
- Smart tools for process observation
- Smart Services for better use of available resources
- Assistant systems for training and guiding (new) employees



Technology solutions demonstrated in the fieldlab can be easily transferred to your shopfloor

implementation examples that will share transferable knowledge of tasks. The field labs cover topics such as simple pick and place applications with series and parallel kinematic robots, a selection of gripping tools under clean room conditions and the integration of assistance systems.

ZeMA's AR Assisted Robot System

Through COTEMACO, ZeMA is optimising existing manual assembly and testing processes through the use of robot and assistance systems. By analysing a continuous development chain, application-oriented, prototypical solutions can be put into practice. The development chain is created from assembly planning to efficient organisation. In this process, workplaces for human-robot cooperation are checked for technical implementation and cost-effectiveness. Work-scientific and safety-related boundary conditions are applied.

For example, ZeMA supported the company Woll in the development of new competences in the field of MRK. Woll was able to obtain information about the various systems in advance and select the system that was most suitable for them. Together we succeeded in building the first prototype of an MRK Station, which can be exhibited. For the realisation of the prototype, the most modern technology was used. The latest robot technologies and man-machine interfaces were implemented. In addition to using the APAS robot, innovative operating interfaces were also introduced. The robot is not programmed classically, but the process is demonstrated by the operator with the help of a component sample. The operator no longer needs to know a robot programming language. The sensors of the robot system can recognise the design of the component pattern and use it to generate a robot program. The operation has also been completely modified. With simple gestures, new product variants can be taught in and processes can be started or stopped.

Discover more

If you're interested in more information and would like to visit one of our field labs, please get in touch

MEET THE Partners

Discover the experts driving COTEMACO



Flanders Make (BE) concentrates on industry-driven technological research and innovation together with and to the benefit of both SMEs and large companies within the Flemish industry. This contributes to concrete product and production innovations in the vehicle industry, mechanical engineering and production environments. The research results can be applied by a wide range of companies, which often face similar technological challenges. Flanders Make consists of three co-creation centra (in Lommel, Leuven and Kortrijk) and labs at the five Flemish universities.

High Tech NL (NL) connects businesses and knowledge institutes to foster and support innovation. They are driving innovation in the high-tech industry, amongst others in the field of crossover agriculture and high-tech/robotics. HTNL will leverage their networks, including Robotics NL to connect relevant SMEs from both the demand side as well as the technology/integration side, to join and partake in the COTEMACO field lab activities.



Food Tech Park Brainport (NL) is an international centre of expertise for technology, product and market innovation for the food processing industry. They offer an environment on which to share knowledge, expertise and provide access to networks. FTB is a technology partner and regional lead coordinating COTEMACO activities in North Brabant. Within COTEMACO, FTB will deliver a field lab in NL. This field lab will connect with the complementary field labs in the UK, BE and DE, and will focus on the food industry.

GLLEP (UK) works with the Government to find solutions to deliver strategic infrastructure that will drive national, regional and local prosperity and economic growth. GLLEP has a particularly strong stake in agro-food and manufacturing sectors. GLLEP will act as the business counterpart for the East Midlands region (UK) supporting UoL, to achieve the project objectives for the region. GLLEP brings long-standing experience in business engagement of SMEs for high-tech applications in the food and rural markets.



BEST (DE) supports work committees in realising their rights due to the works council constitution act. An important part of BEST's advisory activities is to guide work committees through the risk assessment of mental and psychological strain and stress according to the Act on Occupational Safety and Security. This includes all matters of implementing new technologies. BEST's main role in the project is to provide scientific support for the development of socially acceptable adoption strategies for the new technologies developed during the project.

The University of Lincoln (UK) is a leading technology expert for robotics and autonomous systems situated in the East Midlands. The University engages in training of under and postgraduate students and supports innovation in its expertise area among UK based manufacturing SMEs, large companies and tech supplier SMEs. UoL is the technology partner lead for the East Midlands region, bringing relevant expertise in robotics applied to food manufacturing. UoL will also lead the UK field lab set up.



ZeMA gGmbH (DE) is leading COTEMACO activities in Saarland, specialised in automotive (manufacturing & assembly). ZeMA is developed in three research areas – sensors, actuators and manufacturing and assembly processes. Well connected in the academic landscape of the region, ZeMA is bringing Interreg GR Robotix Academy to the project, which integrates research and industry sites for R&D in the human-robot-collaboration field in France, Belgium and Luxembourg. ZeMA will host and upgrade its existing field lab, integrating COTEMACO demonstrators and project activities.

Voka - Limburg CCI (BE) aims to be the most influential, professional and closest network for Limburg entrepreneurs and member companies, currently representing over 3000 members. Voka - Limburg CCI will provide its expertise, network and facilities to communicate, sensitise and support SMEs to join the activities in the project and organise workshops. This will be in close collaboration with Flanders Make. Voka - Limburg CCI particularly brings business expertise to the technical expertise needed in COTEMACO to support SMEs.



Want to get in touch with one of our partners? [Contact us](#)

SECTOR News

Smart Production Lines in Automotive Industry Use

Source: SICK USA Blog

Much like other industries, the automotive industry is changing. With the increase in the variety of vehicle models, variants, and derivatives being produced and the shorter product life cycles in the automotive industry. This is causing suppliers like Continental, one of the world's leading automotive industry suppliers, to take a more dynamic approach. On conventional inflexible production lines, changes or faults at individual stations can

have a major impact on the output of the entire line. The more serious the fault, the more difficult it is to compensate for it. This is why Continental has chosen to create smart production lines.

At Continental's plant in Babenhausen, Hesse, Germany, high-tech components for car dashboards come off the production line at 15-second intervals around the clock. This leaves very little leeway to make

up for downtimes. For this reason, Continental is currently replacing its inflexible testing and assembly lines with flexible, redundant, collaborative testing systems by using collaborative robots. The robots are named Claus (clever automated universal robot system) and Clara (clever automated robot application). They load the testing machines and can be used wherever needed.

[Read more](#)

First Multi-Tool Mount System for the Smallest Collaborative Robots Boosts Automation Productivity

Source: RoboticsTomorrow

New Scale Robotics has announced the first multi-tool mounting system for the smallest collaborative robots. The new NSR-MTM-3-URE Multi-Tool Mount (NSR-MTM) System allows users to mount and control up to three grippers or other tools on one Universal Robots (UR) e-Series cobot.

The NSR-MTM System allows users to quickly set up and perform multiple processes with one robot. Benefits include:

- Higher throughput in small part handling and inspection tasks.

[Read more](#)

DID YOU KNOW?

A dialogue system to enhance goal-oriented human-robot interactions

Source: Tech Xplore

Researchers at SUNY Binghamton, Cleveland State University and the University of Washington have recently developed a new dialogue system that could improve human-robot interactions. This system, presented in a paper pre-published on arXiv, is designed to learn continuously from its dialogue experiences, augmenting its knowledge base and language capabilities over time.

[Read more](#)



MEET US HERE...

(click the titles for more info)

Greater Lincolnshire Food Robotics and Process Automation Conference Holbeach, Lincolnshire - September 26th

The National Centre for Food Manufacturing, in collaboration with Business Lincolnshire, hosts the first Greater Lincolnshire Food Robotics and Process Automation Conference to discuss how a systematic adoption of ground-breaking robotics and automation technologies can considerably advance the food manufacturing sector. During the conference, we will inaugurate the new UK COTEMACO factory and launch the COTEMACO funding scheme.

Opening of the Food Tech Brainport Smart Food Processing field lab Helmond - October 1st

You're invited to the opening of the Smart Food Processing field lab at Food Tech Park in Helmond. This field lab is specifically for food processing companies and aims to familiarise entrepreneurs with the (im)possibilities of collaborative robots and other forms of digital automation. The Smart Food Processing field lab is supported by more than 20 COTEMACO Technology Providers, has 10 demonstrators and offers support for all aspects of implementation, such as feasibility, business planning and aspects such as employee motivation.

NWE making an impact! Tourcoing - December 4th-5th

COTEMACO will participate in Interreg NWE's first ever impact event, a transnational event focused on the results achieved by the 83 NWE projects funded so far, and how to further support their uptake and impact. Through a wide variety of sessions and formats, the programme will offer unique opportunities for participants to network, exchange and explore new potential collaborations:

CONNECT WITH US



VISIT THE ROBOT-HUB WEBSITE



FOLLOW US ON LINKEDIN



CONTACT US

Lead partner
georges.verpoorten@flandersmake.be

Send mail

Press and communications
a.mccready@baxcompany.com

Send mail

COTEMACO PARTNERS



